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Relationship of Digital Media Consumption with Grittiness Among Filipino Children Aged 7-8 Years Old

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Abstract

This research focuses on the relationship of digital media consumption with the grittiness of Filipino children 7-8 years old. This study followed an explanatory sequential research design method. It involved 78 children and 76 parents. Despite the prevalence of digital devices and digital media consumption in Filipino homes, results of the research showed that there is no significant relationship between digital media consumption and grittiness of children. However, specific digital media activities such as listening to music during weekdays for non-school purposes have significant positive weak correlation with grit but have a negative weak correlation during weekends. Similarly, instant messaging and social media were found to have significant negative weak correlations to grit. The perception of parents on how digital media consumption affects the grittiness of their children were also gathered and four major themes emerged – the role of the digital in the home, the perceived effects of digital, parent interventions to manage digital consumption, and the child's nature, which according to parents influence digital media consumption. This research has revealed how extensive the reach and penetration of digital devices and media are in Filipino homes. Thus, it is important that stakeholders in childcare learn how to capitalize on the digital interests of children to develop grit.

Keywords: grit, digital media consumption, digital devices, digital media activities.

1. Introduction

The trajectory for academic and life success, according to research, is established in early childhood as they develop habits for learning and socialization. The Sociocultural Theory of Vygotsky states that early environments and experiences are among the important factors that affect child development. Today, people all over the world are surrounded by media, and the portability of digital devices allows us to stay connected and reachable (Roberts, Foehr, 2008). It cannot be denied that it is the most powerful force in young people's lives today.

Since the introduction of the internet, research has observed children's growing habit and exposure to digital media. A survey showed that 67 % of children, 5-8 years old, already have their own mobile devices, making online viewing more accessible (Rideout, Robb, 2017). In the Philippines, there is 68 % internet penetration (Byrne et al., 2016). Moreover, a digital phenomenon called the "pass back effect," an occurrence where parents pass their mobile phones to their children, gives these children pseudo-ownership of media devices. This occurrence happens 50 % of the time, and often when travelling to keep children entertained (Chiong, Shuler, 2010). However, despite the overwhelming statistics on digital media consumption, UNICEF reports that there is still no common consensus on the rewards and risks that connectivity brings (Keeley, Little,

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2017). To the detriment or development of children, there is no clear stance. No one knows, as experts in various fields, continue to track digital media consumption and its effects on children.

Grit is a non-cognitive trait associated with self-control, and one of the Big Five personality traits – conscientiousness. Its constructs and associated skills are elements of socio-emotional competence (National Research Council, 2015). Socio-emotional development is critical during the early childhood years because these skills are used for interaction, through which learning occurs (Allen et al., 2015; Reschke, 2019; Rueda, Paz-Alonzo, 2018; Stanberry, 2017). Given the relative newness of grit as a construct determinant of success, many research focus on the relation of grit to academic success (Cross, 2014; Hodge et al., 2018; Reraki et al., 2015; Rojas, Usher, 2012; Williams, 2017; Wolf, Jia, 2015).

However, grit development may be endangered by the short-term reward-based incentive models espoused by digital media. The instantaneous rewards make self-regulation challenging and affirms the unacceptable behavior of always being online. This kind of instant reward and gratification may undercut the development of grit, which is founded on the perseverance to pursue an interest despite challenges and setbacks (Roberts, 2014). In this increasing digital age, it is in the cultivation of grit in children that will allow them to succeed despite the instant gratification culture that the 'always on' generation has become (Guida, 2018). The early childhood years is the most relevant stage to investigate the relationship of grit to digital media consumption as habits for development and learning at this stage begin to form (Carlson, 2003).

There are several implications of digital media ownership and rampant internet access. First, it seems that there is an increase in digital media consumption and independence as the child grows older. Based on surveys of children 0-8 years old, digital media consumption on the average is 2.24 hours, an hour more than the recommended media exposure of children below 5 (Hill et al., 2016; Rideout, Robb, 2017). When the child reaches 8-10 years old, digital media consumption rises to 5 hours on the average (Rideout et al., 2010). In addition, research reveals that children spend more time using media devices during weekends than on weekdays (Lee et al., 2019). All these may be due to the proliferation of inexpensive digital devices and the shift of TV as a new media platform to search or stream for movies (Rideout et al., 2010). There were also studies that show how parental co-use of media goes down to 11–19 % when the child is 5-8 years old, from a high of more than 50 % when the child is below 5 years of age. In addition to this, children 5-8 years old choose their own video to watch 95 % of the time. The primary online activities 8-year-old children do are watch videos in YouTube, lurk and participate in social media, and online gaming (Rideout et al., 2010). Parents of children find it hard to make them stop using digital media 47 % of the time (Rideout, Robb, 2017).

The second implication is that media multi-tasking has become rampant. Media multi-tasking is defined as the simultaneous use of media resources to meet one's communication needs (Domoff et al., 2019; Van Der Schuur et al., 2015). Studies show that children 8-10 years old, consume digital media at an average of 5 hours per day, but if multi-tasking will be considered, total digital media consumption is 8 hours. Higher levels of multi-tasking were found to be negatively related to sustained attention and cognitive control in everyday life (Loh, Kanai, 2014; Van Der Schuur et al., 2015). Lastly, digital media consumption has become predominantly passive. Children 5-8 years old spend most of their time watching videos (Rideout, Robb, 2017). Meanwhile, in the Philippines, the initiative to do creative content is low (Byrne et al., 2016). Thus, it is not surprising that the #1 digital platform consumed in 2019 is YouTube (Heller, 2018).

Grit is the perseverance and passion for long-term goals (Duckworth et al., 2007). Grit, as a construct, is rooted on the ideas of self-control, defined as the ability to resist temptation, and conscientiousness defined as having the will to achieve (Cross, 2014; Digman, Takemoto-Chock, 1981; Duckworth et al., 2007). However, the construct of grit, according to Duckworth (2016), differs on consistency of interest and long-term stamina. For example, a person who is conscientious or has self-control may finish a task but may change careers frequently. Grit requires sustained interest and effort on projects that may take longer to complete (Duckworth, Quinn, 2009). Grit is a compound trait comprising of two factors – perseverance of effort and consistency of interest (Duckworth et al., 2007). Alternately, perseverance is persistence and deals with one's ability to continuously apply effort in a difficult task (Lufi, Cohen, 1987), while consistency of interest captures the individual's ability to maintain interest over time (Hodge et al., 2018).

The most significant finding in this popular research on grit is that grit, not IQ, was found to be a predictor of success. Studies initiated by A.L. Duckworth (Duckworth, 2016) found that grit

was associated with positive student performance. This was further supported by other studies that showed grittier students got higher GPAs (Cross, 2014; Wolf, Jia, 2015). Grit was found to predict academic achievement positively and was correlated to academic motivation (Reraki et al., 2015). It was also found to have a direct positive relationship with productivity (Hodge et al., 2018) and grittier individuals also showed better resiliency and growth mindset (Allen et al., 2015). Studies have shown that considering individuals with equal talent, the grittier ones do better. Grit has been identified as an important ingredient to adult and student achievement. This just shows how significant this non-cognitive factor is in predicting success.

One hypothesized determinant of grittiness in children is the time and content consumed using digital media. Given the relative newness of the concept of grit, literature to support this study was focused on the effects of digital media use to the constructs associated to grit, particularly self-control. Self-control is best thought of as self-regulation or the ability to override one's impulses (Mamayek et al., 2017; Muraven et al., 1999). It is also associated with perseverance (Bandura, Walters, 1977). There are concerns that using digital media as a tool to distract or regulate children's behavior may affect their ability to develop mechanisms for self-regulation in the long-term (Radesky et al., 2015). Research revealed that individuals have difficulty establishing self-control when using the Internet (Cliff et al., 2018; Davis, 2001; Tokunaga, 2013).

Other studies focused on the effects of popular digital media activities, such as social media, gaming and watching videos, to self-regulation or self-control, yielded similar results (Firat, 2017; Gabbiadinini et al., 2014; Wilcox, Stephen, 2013). However, other research also suggested, playing video games that involve strategy to reach long-term goals was positively correlated with self-regulation (Gabbiadini, Greitemeyer, 2017). Thus, well-designed, interactive games can be a powerful environment for learning because it can challenge children to learn new skills and behaviors (Lieberman, 2006).

According to A.L. Duckworth et al. (Duckworth et al., 2007), self-control and grit are strongly correlated, however not perfectly. She claims that some people with high levels of self-control can handle temptations but are not able to sustain the interest to pursue long term goals (Duckworth, Gross, 2014). In the attempt to understand effects of digital media consumption to consistency of interest, attention which is another important construct of grit, was reviewed. Research supports that whenever we turn attention to a subject, we have a feeling called interest. Thus, interest depends upon attention (Burnham, 1908).

2. Materials and methods

The research followed an explanatory sequential research design method. There were two sets of participants, namely the children and their parents. Total participants were 78 children and 76 parents. Out of 78 children's respondents, 30 (38.46 %) are 8-year-olds, and 48 (61.54 %) are 7-year-olds; with 49 % male and 51 % female. Most of the children live in a dual parent household (96 %). For the qualitative interviews, a total of 10 parents were interviewed. Three (3) parents were interviewed per grit level, except for the 'non-gritty level' as only one child claimed to be non-gritty. Participants were chosen using the non-probability sampling snowball technique.

Upon electronic submission of the filled-out consent and assent forms, a video instruction for parents was sent via SMS or e-mail. The video was a 3-minute instruction video where the researcher explained the Google form questionnaires and guidelines on how to fill it out and a reminder to assist children in completing the forms.

The Digital Media Consumption Questionnaire contained two parts. The first part was gathering of demographics and the second part included questions about digital media consumption. The survey on digital media consumption was like a Likert type questionnaire where parents had to choose among a range of time their children did an online or offline digital media activity. This questionnaire was adapted from the *2020 Common Sense Census* and the *Kaiser Family Foundation questionnaire* on media use among young children and teens. This adapted questionnaire was completed by the parents based on observation of their child's digital media use. Parents were asked to choose a focal child in their household as the reference in filling out digital media consumption questions.

The Grit Scale for Children was adapted from *Angela Duckworth's 8-Item-Grit Scale for children* known as *Grit-S*. It is a two-factor scale which measures trait level perseverance and passion for long term goals. This was consistent with the Theory of grit as a compound trait. Confirmatory analyses supported a two-factor structure, and both showed adequate internal consistency and were strongly

intercorrelated, r = .59, p < .001. Grit-S was a more economical measure of grit, compared to the original 12-Item-Grit Scale, known as Grit-O. The Grit-S is a 5-point Likert type grit scale. This was a self-evaluation questionnaire completed by the child under the guidance of their parents. A language expert was tapped to translate the scale from English to Filipino.

Online Interview with the parents was conducted to further understand the children's digital behavior. The interview was non-structured and was conducted after the completion of quantitative surveys.

For the quantitative data, descriptive statistics, particularly mean and frequency were utilized for demographics and online activities.

For the total Grit-S score, reverse coding was used for the Grit-S scale, particularly for questions 1, 3, 5, and 6. These are the one that refer to Consistency of Interest and was done in that way so that the computation for the correlation values will not show inverse direction (Roszkoski, Soven, 2010).

T-test was used to compare differences among sub-groups. Only two demographic factors were included to determine if there is a significant difference between grouped demographic factors in digital media consumption, that is, gender and educational attainment of parents. The other demographic factors like parent households, household income, and academic degree were excluded because of the unequal skew in number of respondents. Also, the age demographic factor was excluded because digital media consumption of a 7-8-year-old are usually lumped together due to nearness of age (Rideout, Robb, 2017). Pearson r correlation was also used to establish significant relationships, while regression analysis was used to understand the effect of digital media consumption to grittiness.

For the qualitative data, thematic analysis approach was used (Clarke, Braun, 2014) and it involved a six-step to identify the themes (Nowell et al., 2017). The themes and process transcriptions were further examined and certified by a pre-school educator.

3. Discussion

The digital media consumption of Filipino children is not far from the recorded digital media usage trends in the existing research of Western countries. In terms of accessibility and ownership, children 7-8 years old had higher accessibility to digital devices than ownership, which is congruent to the 'pseudo-ownership' concept of media devices (Chiong, Schuler, 2010; Fitzpatrick et al., 2023). This may be due to the economic class, middle to upper, of most of the respondents and thus have the means to acquire multiple digital devices for family use. Hours of exposure to digital media is at a minimum of 9.5 hours per day, which comes close to the data from past research which states that children 8-10 years old consume up to 8 hours of digital media when multi-tasking (Van Der Schuur et al., 2015). The phenomenon of using TV as a new media platform is common, as parents revealed that one of their problems was "televisions right now can access the Internet." This means that the digital media content is so ubiquitous at home, that a traditional medium like the television has been invaded. This makes access to digital media content more challenging to control. Like the existing literature from Common Sense Media, parents find it hard to make their children stop consuming digital media without negotiation, and some would often give in. This inconsistency in implementing established rules at home is a common finding in past research, where parents are not necessarily effective in limiting child use at home (Rideout et al., 2003) and, at times, opt for indirect methods of influencing their children's media use (Savadova, 2023). The implication is that the children will have more exposure to digital media, which according to interviewed parents consumes most of their time. It was added that they understand the negative impact on the child's behavior.

The top activities consumed during weekends for non-school purposes are primarily passive such as watching online TV shows or movies and interactive such as playing online games – a common finding in past research among children 5-8 years old (Rideout et al., 2010). Results of this research showed that there is no significant difference in digital media consumption among girls and boys. However, when broken down to individual digital activities, instant messaging between genders showed a significant difference with males being higher users. This is contradictory to U.S research where girls were the predominant users of this activity (Common Sense Media, 2019). The boys were found to use instant messaging more, possibly due to gaming. Playing games is one of the common social activities being done, complemented with instant

messaging and calls for immediate interaction with friends. As a parent puts it "they play so much with friends. They require a phone to talk to each other."

For non-school purposed, playing video games is among the top 5 digital media activities among the boys during weekends and weekdays whereas girls who only play computer games only on weekends. This distinction in digital media use may have something to do with brain differences between males and females. According to research, men could be more biologically prone than women to gaming obsession, while women are more compelled to keep up with what their friends are posting in social media (Jargon, 2019). Results of this research also show that siblings appear to have an influence in the increased consumption of digital media, which supports past research that says having siblings appears to influence increase and decrease of digital media use (Bagley et al., 2006; Davies, Gentile, 2012; Hardy et al., 2006). Parents have observed that when a sibling is online playing digital games, and the other is doing a task, the latter would sacrifice the quality of work to participate in the play.

This research presented the opportunity to uncover a nuance on how Filipino families regulate digital media consumption in their homes, i.e., by emphasizing studies first. Compared to Western countries, Asian parents see education as an important path to success (Breitenstein, 2013). This is manifested by setting home rules that put study first as shown in the statement, "weekend they (children) can use it (the internet) 2:30 p.m. onwards, provided all homework and quizzes are done. If there is pending, no play." It was also noted during the interviews that digital media consumption was used more as a punishment through deprivation, than as a form of reward. However, leniency in the use of digital media is seen once all academic work is done. This disciplinary strategy of using reinforcement and punishment to modify behavior is rooted on the Behaviorism Theory. As a result of punishing or rewarding digital media consumption in connection with academic performance, it is possible that parents are unknowingly raising grade-conscious children rather than comprehension-focused individuals. Research also suggests that parents should develop a more effective strategy other than screen-related interventions, as this practice may increase the likelihood of children exceeding their media time (Samaha, Hawi, 2017).

The children who responded to the current study were gritty. This means that they can practice perseverance of effort and consistency of interest, the two basic factors that make up grit. Children can mostly relate to the perseverance statements, and mostly to being hard working. Although the practice of self-control may be negatively influenced by exposure to the Internet based on studies (Davis, 2001), it may not always be the case as attested by the parents. The child's nature, according to parents, impact their ability to persevere. This insight also supports past research, which posits that well-designed, interactive games can be a powerful environment for learning because they can challenge children to learn new skills (Lieberman, 2006), create communities of practice in the classroom (Scholes et al., 2022) and improve social and learning outcomes in preschoolers (Fitzpatrick et al., 2023).

Scores on consistency of interest, on the other hand, reveal that children somewhat find themselves distracted. Respondents may be gritty but very much prone to distraction. Some parents say that their child's distraction which later leads to loss of interest. Others, however, believe that exposure to the digital has led to distraction. This is congruent to past research that heavy media multi-taskers were reported to be poor in inhibiting task-irrelevant stimuli and had more failures of attention in everyday life (Lui, Wong, 2012; Ralph et al., 2014). Exposure to digital media also leads to replacement of interests and change of behavior where they seem impatient when viewing contents as shown in the following statements, "they used to read *Thea, Dork Diaries* and *Harry Potter*. Since exposure to digital games, they lost interest in books."

This research reveals that despite the ubiquity of digital devices and its high penetration in homes and consumption practices, there is no significant relationship between digital media consumption and the grittiness of children. Digital media activities, as observed by parents, is claimed to be affecting a child's consistency of interest and perseverance of effort when it becomes a source of distraction and when it affects a child's emotions and behavior when asked to unplug. However, an important factor to consider is how these perceived negative effects are balanced out by the child's nature, parent intervention, and the digital's positive role in the lives of families at this time of the pandemic. According to A.L. Duckworth (Duckworth, 2016), every human trait is influenced by nature or genetic factors and nurture or human experience. This means that some of the variability of grit can be attributed to genetic factors, aside from experiences.

Past research also tells us that parental involvement is positively associated with the development of grit. An example of involvement is when parents push their children to do their best in whatever they do (Howard et al., 2019). This kind of involvement is presently seen in the home, especially when parents instill in their children the importance of studies. Moreover, digital devices are seen by parents as an integral part of family life; they are no longer a privilege but rather a need. This implies that the environment one grows up in really matters, on top of the genes inherited.

It was deduced that using social media and instant messaging during school had a weak but significant negative correlation to grit. This means that the more children use social media and instant messaging, which are classified as activities that are used for communication, the less gritty they become. This is congruent to the studies that claimed how the use of social media, such as Facebook, resulted to lower self-control and mental persistence – constructs that are strongly corelated to grit (Firat, 2017; Wilcox, Stephen, 2013). In the study of M. Firat (First, 2017), the negative relationship of Facebook use to self-control was due to distracting contents. Evidence also suggest that online social networks can influence self-control by elevating feelings of self-worth that leads to impulsive or indulgent behavior (Wilcox, Stephen, 2013). Further, as a person continues to view positive feedback from close friends, this leads to higher feelings of self-respect, which makes one feel deserving of indulgent behavior. This effect of social media on self-control is concerning, given that it is an important skill to social and emotional well-being. The increased penetration of digital media devices that promotes access to social networks will subsequently mean that more people may be prone to make poor choices or decisions that may affect their well-being.

In addition to social media, instant messaging was reported to be detrimental to schoolwork according to research due to more time spent actively chatting on the Internet (Junco, Cotten, 2011). Paying attention to schoolwork and instant messages at the same time may reduce capacity for essential cognitive processing (Mayer, Moreno, 2003). Thus, meaningful learning may be impaired since multitasking may result to increased cognitive demand or mental overload. This means that a divided attention may be detrimental to academic achievement.

Although no significant relationship was found between total digital media consumption to grit, a more thorough investigation was done on the relationship of individual digital media activities to grit. It was discovered that listening to music during weekdays for non-school purposes had a weak but significant positive correlation with grit while doing the same thing during weekends had a weak but significant negative correlation to grit. Some research revealed that music has a positive effect on the socio-emotional behavior of school children as it helps create an environment effective for teaching and learning by promoting a more complex perception of reality, imagination, thought, and attention (Hallam, 2010; Jucan, Simion, 2015; Simion, 2014). Also, socio-emotional learning is integrally related to grit, as self-control is one of the important skills in socio-emotional learning (Chernyshenko et al., 2018). However, past studies also reveal that different types of music impact performance. In the study on the effects of sedative and stimulative music on task performance, it was revealed that stimulative music increased worry scores and interfered with concentration (Smith, Morris, 1977). Stimulating music may increase level of arousal, especially when doing complex tasks, which may lead to task performance deterioration (Hallam et al., 2002). This distraction makes it difficult to sustain tasks or to finish whatever was begun.

No previous research has concerned itself on the varying responses of children to music depending on the time of day and day of the week (North et al., 2004). However, according to existing research, it can be expected that music serves different functions at different times of the day and week. Music experienced during the weekday would be expected to complement other activities, whereas music experienced during weekend would perhaps be more to fulfill emotional functions (North et al., 2004). Thus, it is possible that weekend music may be more distracting as its function is more personal rather than complementary. The relationship of listening to music and grit is a novel finding. This should be investigated further to determine how listening to music in the digital space, as well as its purpose when listened to at a certain time or day, is able to influence grit. More importantly, this could lead to breakthrough ways on how to transpose the process of growing grit while listening to music to potentially other digital media activities that may be of interest to children.

4. Results

Results show that most Filipino children have their own laptops (54 %), tablets (51 %), and smartphones (35 %). Only 7 % do not own any device. In terms of accessibility, higher percentages are seen, i.e., laptops/ desktops (85 %), Smartphones (81 %), Smart TV (72 %), and tablets (67 %). This proves how entrenched digital devices and media are in the lives of young children today.

The top 5 activities being done by males and females during weekends for non-school purposes are similar except during weekdays (Table 1). Females during weekdays tend to spend more time reading e-books, while males spend more time playing video games.

Table 1. Digital Media Consumption for Non-School Purposes Male vs Female

Non-School Purpose	Weekend		Weekday	
	Male	Female	Male	Female
Play computer games	2.40	3.00	2.09	2.64
Play video games	2.53	2.09	2.38	1.82
Play mobile games on phone or tablet	2.35	2.19	2.19	2.32
Watching online videos	2.34	2.54	2.33	2.55
Watching online TV shows or movies	2.79	2.75	2.33	2.53
Use social media	0.00	1.13	1.50	1.50
Instant messaging	1.17	1.33	1.43	1.22
Listening to music	1.54	1.50	1.63	1.57
Reading e-books	1.57	1.80	1.67	2.09
Browsing websites	1.13	1.60	1.50	1.50
Video chatting	1.50	1.46	1.36	1.36
Making own art or music	1.36	1.71	1.55	1.76
Writing something on a computer like a story, blog, etc.	1.60	1.17	1.43	1.60
Giving commands to voice activated speakers	1.33	1.25	1.50	1.08
Online shopping	1.33	1.00	1.33	1.00

Legend: 0.1-1.0 – less than 30 mins; 1.1-2.0 – 30 to 60 mins; 2.1-3.0 – 1 to 3 hrs; 3.1-4.0 – More than 3 hrs

However, for school purposes, Table 2 shows that the activities of males and females are more differentiated during weekdays and weekends, except for the synchronous and asynchronous classes that are common activities, as most schools shifted to online learning due to the pandemic.

Table 2. Digital Media Consumption for School Purposes Male vs Female

School Purpose	Weekend		Weekday	
	Male	Female	Male	Female
Synchronous classes	2.63	2.43	2.86	3.33
Asynchronous classes	2.53	2.47	2.63	2.67
Play mobile games for school	2.00	2.00	1.23	1.13
Watching online videos	2.00	2.00	1.35	1.32
Watching online TV shows/movies	2.20	2.00	1.50	1.40
Use social media for school	2.00	2.00	1.00	1.43
Instant messaging for school	2.50	2.20	1.00	1.29
Listening to music for school	2.00	2.00	1.00	1.17
Reading e-books for school	2.33	2.44	1.62	1.50
Browsing websites for school	2.50	2.14	1.40	1.35
Video chatting for school	2.00	2.33	1.83	1.90
Making own art or music	2.00	2.15	1.45	1.65
Writing something on a computer like a story	2.60	2.00	1.50	1.75
Reading online articles	2.17	2.00	1.36	1.48

Legend: 3.1-4.0 – More than 3 hrs; 2.1-3.0 – 1 to 3 hrs; 1.1-2.0 – 30 to 60 mins; 0.1-1.0 – less than 30 mins

The t-test result shows that overall digital media consumption mean score of the male and female respondents are not significantly different $t(75) = .789$, $p = .432$. However, looking at the individual digital media activities, there was a significant difference between males and females, t(60) = 2.523, p = 0.14 for instant messaging. In terms of educational attainment of parents, there is no significant difference between parents that are bachelor's degree graduates and post-graduates on the digital media consumption of children, different $t(75) = .628$, $p = .532$

Table 3 shows the mean score of the respondents from the grit questionnaire. Overall, the respondents are rated as Gritty (2.51). According to A.L. Duckworth (Duckworth et al., 2007), grit is a compound trait comprising of two factors – perseverance of effort and consistency of interest. For perseverance of effort, the categorical mean of 2.83 has a descriptive interpretation of 'mostly like me.' This implies that the respondents can somewhat relate to the statements pertaining to perseverance of effort, with 'I am a hard worker' resonating the highest.On the other hand, the categorical mean of 2.20 for consistency of interest has a descriptive interpretation of 'somewhat like me.' This implies that the respondents are somewhat inconsistent in pursuing interests.

Table 1. Level of Grittiness using Grit-S Questionnaire

Grit Indicators	Mean
Perseverance of Effort	2.83
Setbacks (delays and obstacles) don't discourage me. I bounce back from disappointments faster than most people.	2.41
I am a hard worker	3.03
I finish whatever I begin	2.92
I am diligent (hard working and careful)	2.96
Consistency of Interest	2.20
New ideas and projects sometimes distract me from previous ones	2.01
I have been obsessed (hooked) with a certain idea or project for a short time but later lost interest.	2.08
I often set a goal but later choose to pursue (follow) a different one	2.37
I have difficulty keeping my focus on projects that take more than a few months to complete.	2.34
Mean Total	2.51

Legend: 0.0-1.0 – Not Gritty at All; 1.1-2.0 – Slightly Gritty; 2.1-3.0 – Gritty; 3.1-4.0 – Extremely Gritty

Correlation Analysis reveal that there was no significant relationship between the overall Digital Media Consumption and Level of Grittiness, regardless of whether it was during Weekdays Non-School/School or Weekend Non-School/School.

However, exploring the correlation of individual digital media activities to grit, listening to music during weekdays for non-school purposes indicates significant positive weak correlation, $r(76) = 0.306$, $p<0.01$. On the other hand, listening to music during weekends for non-school purposes indicates significant negative weak correlation. $r(76) = -0.232$, $p<0.05$. This implies that listening to music during weekdays for non-school purposes positively correlates with grit but have an inverse effect during weekends. The use of social media and instant messaging for school purpose also indicates significant negative weak correlation during weekdays, $r(76) = -0.324$, $p<0.01$; as well as during weekends, $r(76) = -0.283$, $p<0.05$. This implies that using social media and instant messaging for school negatively correlates with grit.

5. Conclusion

This research shared how parents value digital devices and media as they now see it as a source of entertainment, relief from the pandemic, school partner, and source of learning. Although there is no consensus on the risks and rewards of connectivity, results of this research show that digital media exposure has its rewards in the form of actively feeding a child's curiosity. However, there are risks such as how it affects a child's patience based on parent's feedback. By embracing the digital era and proactively preparing for the changes brought by expanding technologies, children can be ready with relevant skill sets to protect themselves and equip them for the

next generation. The time to begin arming children for the challenges and demands of the future is when they are young. It is the responsibility of parents, educators, content providers, and policy makers to create relevant, yet responsible learning experiences and environments for children.

This research has revealed the extensive reach and penetration of digital devices and media in Filipino homes. The ownership and accessibility of digital media, coupled with digital media consumption habits and parent's feedback of its usage at home, prove how digital has captured their attention. Thus, capitalizing on this interest to propel development may be a compelling child-centered approach to learning. Based on this research, one of the best ways to instill grit to learn is to use what distracts them the most – digital technology. Parents and educators should be more open to a learning approach that provides opportunities for children to explore and test their skills online. The objective is to have multiple interesting and suitable options for children to absorb information. They should take an active mediation role in monitoring digital media content and consumption habits. Active mediation goes beyond monitoring the duration of use, this includes processing and having a discussion on the digital content being consumed.

On the other hand, policy makers should develop strategies that will address the spread of inappropriate content that may affect child development. Policy makers should devise ways by which the national education system can help educators' re-tool themselves on the best way to use digital media in the classroom and teach digital citizenship. Instead of using digital technology as an upgraded blackboard, this should be integrated purposefully into the curriculum. Successful utilization of digital technology depends not only on access to tools, but also on the availability of training and support for teachers, which policy makers should provide. Likewise, content creators should proactively create purposeful content that aims to develop positive skills in children rather than be a cause of distraction, which may be entertaining now but detrimental in the long term. Games and content must be properly tagged for its age appropriateness. The target age will also define how digital activities will be marketed to avoid a blanket advertising strategy that may attract young kids. Lastly, digital activities tailored for young children should be tested before claims on its benefit and outcome are made.

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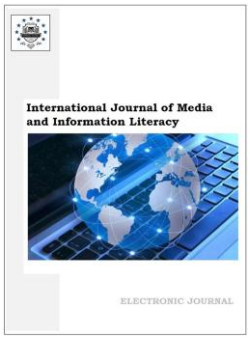

Does Mass Media Echo Chamber Mediate on Biased Script Assimilation, Fact-Checking Journalism, And Voting Preferences?

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Abstract

In this digital era, the impact of mass media in electioneering activities cannot be underestimated in every country that practices a democratic system of government. In mass media domain, echo chamber's effect on fact-checking journalism, biased script assimilation, and voting preference appeared to lack an empirical investigation, especially in developing countries such as Nigeria. To fill this extant gap, this study aims to evaluate the mediating role of mass media echo chambers on fact-checking journalism, biased script assimilation, and voting preference in Nigeria. To realize this aim, a quantitative study was implored to ascertain the mediation mechanism and infer the study's findings. The outcomes of the study demonstrated that mass media echo chambers fully mediated the relationships between fact-checking journalism, biased script assimilation, and voting preference respectively. Thus, we strongly recommend using mass media for politicking since it provides an avenue for the preferred candidates' fact-checking and countering assimilated biased scripts on the voters' choice of candidates. Furthermore, the results on the individual factors' contribution to voting preference also established that the mass media echo chamber contributed the most to the voting preference. Consequently, it has proven to be an indispensable asset in persuading voters' choice of candidates in election.

Keywords: politicking, delegates; Nigerian presidential primary elections; mass media echo chambers; voting preference.

1. Introduction

Mass media is deemed beneficial in all facets of secular activities, this is because it is vital for the dissemination of information, dispatching of news, and as a tool for enlightening the public on government events and decisions. These were achieved through mass media such as newspapers, magazines; television; radio; and news agents before the advent of new media (Andrejevic, 2019). With the emergence of new media which comprised online news media, social media, and content websites, the roles of mass media expanded beyond conventional usage (Lee, Fong, 2021). It subsequently extends to using it for supporting business and social desires, advertisements, propaganda, public relations, and political correspondence (Hudders et al., 2021). Similarly, mass media promotes hybrid content by utilizing it for information and publicity in the marketing domain (Stürmer, Einwiller, 2023); therefore, it buttresses sponsored content (Hardy, 2021).

In other sectors such as health, mass media helps in combating health misinformation, especially in this era of a public health crisis (Peng et al., 2023). Mass media also intensifies the strength of social media in promoting democracy and public discussions by exposing people to politically diverse opinions (Terren, Borge, 2021). In the area of innovation, mass media serves as an avenue for managing the flow of knowledge in various organizations by using social media for

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projecting behavioural and resource-based perceptions (Bhimani, et al., 2019). Furthermore, it provides forums for sharing knowledge that can instigate new areas of research via social media (Ahmed, et al., 2019). Additionally, Zhao et al. (Zhao et al., 2021) projected that mass media facilitates educators' digital competencies, improves learning approaches, and offers suitable tools for enhancing education quality through virtual media platforms. Similarly, it serves as the best forum for dispatching disastrous warning information, trending information, and promoting upcoming social media influencers (Zhang, et al., 2019). Mass media reinforces online participatory journalism by providing avenues for the public to participate in the professional news creation processes (Engelke, 2019). On the other hand, Dwivedi et al. (Dwivedi et al., 2021) demonstrated that the role of mass media via social media outlets cannot be underrated in the business domain, this is because it helps to sustain customers' satisfaction, brings about value creation, improves customers' relationships, and enhances business companies' corporate credibility. Moreover, mass media paves the way for a digitalized society by bridging the digital divides that help in promoting policy measures, education groundings, and tailoring designs (Vassilakopoulou, Hustad, 2023).

From the Nigerian setting as the study's area, the impact of mass media through information and communication technology (ICT) has been felt in different professions irrespective of the challenges that impede the adoption of ICT in Nigeria, for example, in the construction firms, it serves as an avenue for dispatching interactions and tasks among individuals (Moshood et al., 2020). In the health sector domain, a study that was done in Nigeria attested that mass media plays a huge role in promoting health activities (Wogu et al., 2020). Similarly, mass media has been found to play an important role in spreading maternal health consciousness in Nigeria despite the obstacles that hinder access to communication technologies, thus the study emphasizes the need to intensify the level of maternal health awareness via other mass media forums (Igbinoba et al., 2020).

Moreover, Do et al. (Do et al., 2020) through one of the Nigerian studies, attested that mass media exposure makes a huge impact in encouraging partners to embrace family planning and adopt the use of modern contraceptives for minimizing unwanted pregnancies and birth rates. Olaniyan and Akpojivi (Olaniyan, Akpojivi, 2021) further demonstrated that the convergence of social media in the newsroom spectrum through the internet has widened the democratic nature of Nigeria despite the misuse of these media platforms by the public. However, in terms of factors that can impact electioneering in Nigeria, many variables such as opinion leaders' influence, religion, family, and mass media were outlined as predictors of the voting behaviour of the electorates in elections (Adeagbo et al., 2019). Other factors such as tribalism, ethnicity, corruption, sentiments, and the power of incumbency are also influencing the electorates' choice of voting in Nigeria (Ugbada, 2019; Paul, 2019).

Thus, there is still uncertainty about the power of mass media on the choice of presidential candidates by the delegates in the presidential primary elections (Uwalaka, Nwala, 2022; Adanlawo, Reddy, 2020). It is against this backdrop that we viewed this study as a worthwhile project to ascertain the role played by mass media in determining the choice of presidential candidates by the delegates of the three major political parties comprising All Progressives Congress (APC); Peoples Democratic Party (PDP); and Labour Party (LP) before 2023 general elections in Nigeria.

Consequently, our study specifically aims to look into antecedents of mass media echo chambers on voting preferences. Hence the general aim of this study is to evaluate the mediating effects of mass media echo chambers on biased script assimilation and fact-checking journalism on the delegates' voting preferences in the Nigerian 2022 presidential primary elections and examine the individual contributions of the independent variables on the voting preference. It is assumed that the findings of this study could help to highlight the need to prioritize fact-checking and the kind of information that is presented to the electorates via mass media for gaining their franchise in an election. Furthermore, it can advance the democratic system of government in Nigeria and proffer the best mass media that could be used for soliciting the electorates' mandates towards enhancing the chances of voting for better candidates in an election. To this end, our study intends to find answers to the following specific research questions:

(1) Did the mass media echo chamber mediate the relationship between biased script assimilation and delegates' voting preferences?

(2) Did the mass media echo chamber mediate the relationship between fact-checking journalism and delegates' voting preferences?

(3) What were the individual contributions of the independent and mediator variables on the delegates' voting preferences?

(4) What were the other mediums delegates got news about their preferred presidential candidates during the Nigerian 2022 presidential primary election?

2. Materials and methods

The materials used in this study comprised the earlier published media studies and political communications-related documents. Our study adopted the cultivation theory propounded by George Gerbner in the late 1960s and the rational decision-making model offered by Nigel Taylor in 1998 for ascertaining the mediating effects of mass media echo chambers on biased script assimilation and fact-checking journalism on the delegates' voting preferences. The survey quantitative method was employed in the study for quantifying the data and inferential study requirements. Hence, the descriptive part of the data was analyzed via Statistical Package for the Social Sciences (SPSS) whilst the mediation mechanism was analyzed through Structural Equation Modeling (SEM-AMOS). Regarding the sample size of our study, the Krejcie and Morgan (Krejcie, Morgan, 1970) sampling technique was used and determine the sample size from the 3,341 delegates' population that participated in the Nigerian 2022 presidential primary election.

Eventually, the sample size of 316 who participated in filling out the survey was used for the study. The questionnaire was proportionately administered among the major three political parties' delegates, which constituted the All Progressives Congress (APC), Peoples Democratic Party (PDP), and Labour Party (LP). Furthermore, the 32 questions used and measured the variables of this study were adopted from (Ackermann, Stadelmann-Steffen, 2022; Frimpong et al., 2020). However, biased script assimilation and fact-checking journalism were the independent variables of this study; the mass media echo chamber was the mediating variable while voting preference was the dependent variable. In terms of the data analyses of the study, the mediation mechanism hypotheses were analyzed via (SEM). Before arriving at the SEM analysis result, we ensured that the three stages of SEM requirements were met. We further established that three criteria for goodness of fit indices were satisfied. In other words, CMIN/DF was <5(2.459), Tucker-Lewis Index (TLI) was ≥ .90 (.989) and the Root Mean Square Error of Approximation (RMSEA) was ≤.08 (.060) as (Hair et al., 2012) illustrated. Bootstrapping was finally run for mediation mechanism results.

3. Discussion

Voting preference has become integral in the study of election outcomes especially when people's ideas on politics are aligned. The voting preference impact in politics is one of the key factors that influence who is elected into public office in most democracies. While scholars have established the effect of election campaigns on voting preference, others contend that other factors like biased script assimilation have a direct or indirect influence on voting preference (Nagtzaam et al., 2017; Chowdhury et al., 2020; Guntermann, Persson, 2023). Establishing the relationship between biased script assimilation and voting preference, Johann et al. (Johann et al., 2018) aver that the tone of news media reporting affects citizens' party choices. Voters are more likely to vote for a candidate or party if the news media report favorably about them. Biased script assimilation deals with any opinion formed by exposure to disinformation which in turn affects voters' preference of a political candidate. Bowes et al. (Bowes et al., 2022) corroborate that people's interpretation and evaluation of information are also susceptible to bias. Biased assimilation is the tendency to readily accept confirmatory evidence as true but dismiss disconfirmatory evidence as false.

Consequently, when voters internalize biased news articles which promote specific opinions about a political candidate, they either affirm or reject that preferred candidate (Hamborg et al., 2019; Hassell et al., 2020; Rodrigo-Ginés et al., 2023; Rohrbach et al., 2023). However, arguments abound that mass media echo chambers have influences on politics (Haw, 2020). The mass media echo chamber is principally concerned with mass media audience dynamics; it is a way audience fragmentation on matters of access to information and social interaction works. Figà Talamanca and Arfini (Figà Talamanca, Arfini 2022) elaborate that an echo chamber is a social network, a community of people with social ties with one another who share a set of opinion(s) while interacting with opinions and viewpoints that would contradict them. The consequence of such a

homogenous information structure is worthy of attention especially when the scope of its influence is taken into cognizance (Dutton, Robertson, 2021; Kitchens et al., 2020).

Evidence from studies holds that the effect of mass media echo chambers in both political and communication discourse is a consequence of modern-era choice media which instigates selective exposure. Therefore, multiple media choice has been argued to be responsible for the effect of mass media echo chambers of media in matters of politics (Rabb et al., 2023).

However, Dubois and Blank (Dubois, Blank 2018) argued to the contrary, according to them, interest in politics and a diverse media diet tend to limit the extent to which people are caught in echo chambers. Conversely, others reiterate that individuals who spend more time around like-minded people do not only become more exposed to pro-attitudinal messages but decrease their exposure to counter-attitudinal information (Barberá, 2020).

Worth noting is that despite the plethora of debates surrounding the effect of mass media echo chambers, few studies abound regarding its mediating effect on the relationship between variables like biased script assimilation and voters' preference (Guo et al, 2020; Karlsen et al., 2017; Geiß et al., 2021; Modgil et al., 2021). Scholars have argued about the effect of mass media echo chambers on voting. Ackermann and Stadelmann-Steffen (Ackermann, Stadelmann-Steffen, 2022) argue that a voter wrapped up in his preferred party's "echo chamber" would probably not consider several parties as eligible and, thus, is less likely to cast a vote for a candidate from another party.

Similarly, Fredén et al. (Fredén et al., 2022) support that social networks have important effects on strategic voting, but these effects only arise when networks have the characteristics of echo chambers. While arguments about the effect of mass media echo chambers have been established, this paper contributes to existing studies on the phenomena by exploring its ability to mediate relationships between variables. Therefore, this study explores the effect of mass media echo chambers on the relationship between biased script assimilation and delegate voting preference. Thus, we hypothesize that:

H_1: The mass media echo chamber meditates on the relationship between biased script assimilation and delegates' voting preferences.

Another predictor of voting preference is fact-checking journalism. Fact-checking is symptomatic of a practice aimed at assessing the accuracy of political claims made by politicians to members of the public. Having gained momentum since 2010, fact-checking plays the key role of adjudicating truth which is integral not only in journalism but also in determining who the best political candidate may be (Chung et al., 2023; Robertson et al., 2020). Conceptualizing fact-checking Amazeen et al. (Amazeen et al., 2019) hold that the contemporary practice of political fact-checking entails publicly reporting on the accuracy of a claim or text already circulating in the media. The role of fact-checking journalism in the political sphere is premised on the need for truth especially when disinformation of electioneering is considered. Barrera et al. (Barrera et al 2020) affirm that, as alternative facts become part of modern politics in established democracies, so does fact-check; mainstream media have increasingly invested in checking politicians' claims and providing rebuttals.

However, the argument on the effect of fact-checking has aroused scholarly debate, especially regarding voting behaviour. While some scholars argue that fact-checking might have minimal effect on voters, others argue to the contrary (Robertson et al., 2020; Agadjanian et al., 2019; Oeldorf-Hirsch et al., 2023).Wintersieck et al. (Wintersieck et al., 2021) argue that beyond increasing voter knowledge, scholars have found fact-checks influenced the opinions of voters as well.

Contrary to this argument, Nyhan et al. (Nyhan et al 2020) corroborate that exposure to fact-checks can reduce misperceptions among supporters of both major party presidential candidates but did not affect attitudes toward those candidates. However, Carson et al. (Carson et al., (2022) reiterate that fact-checking can have the adverse "backfire effect" by making the journalist appear partial, which can undermine trust in the accuracy of the information or, in some examples, increase belief in the falsehood under review. A furtherance of this debate has explored other factors that can affect the influence of fact-checking (Himma-Kadakas, Ojamets, 2022; Kyriakidou et al., 2023).

In the same vein, studies have explored factors like mass media echo chamber and their effect on fact-checking journalism. While highlighting the effect of echo chambers on fact-checking, Li and Chang (Li, Chang, 2023) affirm that social media networks tend to form "echo chambers" of ideological segregation, which cloud people's judgment on what to believe or share. Diaz Ruiz and

Nilssonalfound that the mass media echo chamber forms a shield that resists counter information which might change people's behaviour on a subject matter. Exemplifying through Earth shape argument, Diaz Ruiz and Nilssonal (Diaz Ruiz, Nilsson 2023). hold that, the flat earth echo chamber is a suitable context because of its resistance to fact-checking. Corroborating this position Karimov et al.narrowed the effect of mass media echo chambers on fact-checking to voting preference.

According to Karimov et al. (Karimov, et al., 2022), promoting fact-checking journalism, blocking access to sources of active disinformation, encouraging public dissemination of scientifically proven information, or having experts in the field appearing in mass media has little or no effect on a person inside the echo chamber.

While the arguments have established the relationship between mass media echo chambers and fact-checking, a paucity of studies on the effect of mass media echo chambers in mediating this relationship exists. Therefore, this study investigates the ability of mass media echo chambers to mediate the relationship between fact-checking and delegates' voting preference during the last presidential primary elections in Nigeria. Worthy of note remains that, this study is a furtherance of scholarly debates on the effect of mass media echo chamber and it argues that mass media echo chamber affects the relationship between fact-checking and delegates voting preference. Hence, we propose that:

H_2 Mass media echo chamber has a mediating effect on the relationship between fact-checking journalism and delegates voting preference

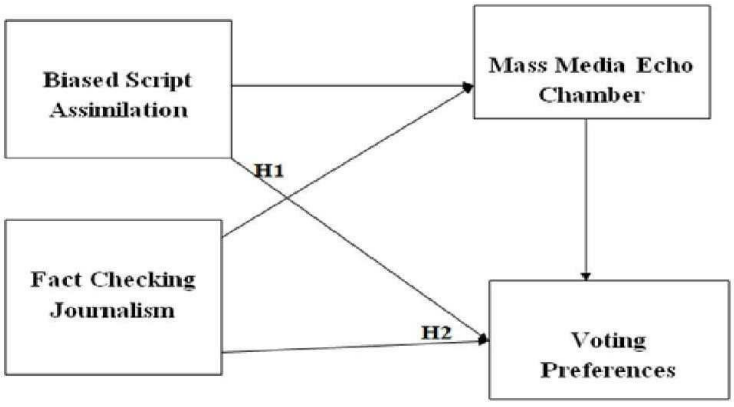

Fig. 1. The Study's conceptual framework

4. Results

This section discusses the findings of our study which explicitly evaluated the mediating effects of mass media echo chambers on biased script assimilation, fact-checking journalism, and voting preferences during the Nigerian 2022 presidential primary election, in terms of the profile of the three major political parties delegates we examined in this study,

Table 1 demonstrates that the majority of the respondents are male while the age of more than one quarter of them falls within 40 years and above. Concerning their marital status, it shows that the majority of them are married. Regarding their level of education, the majority of them had a university education. Furthermore, the data establishes that the greater numbers of respondents who participated in the study are Christians.

Table 1. Demographic Profile of Participants (n=316)

Demographic Factors	Frequency	Percentage (5)
Age		
21 – 30	56	17.7
31 – 40	92	29.1
41 – 50	93	29.4
Gender		
Male	243	76.9
Female	73	23.1
Marital Status		

Demographic Factors	Frequency	Percentage (5)
Married	211	66.8
Single	93	29.4
Divorced	8	2.5
Widow	2	.6
Widower	2	.6
Level of Education		
Primary	1	.3
Secondary School	17	5.4
Diploma	47	17.9
University	251	79.4
Religion		
Christians	194	61.4
Muslims	116	36.7
Others	6	1.9

The findings of the first research question on whether mass media echo chamber mediates the relationship between biased script assimilation and delegates' voting preference, showed in Table 2 that the direct model outcome was $\beta = 170$, $p < .05$; the mediation model result was $\beta = .150$, $p > .05$; and the standardized indirect effect outcome (SIE) was $\beta = .031$, $p < .05$. Thus, the standardized indirect effect outcomes proved that mass media echo chamber mediated significantly between biased script assimilation and delegates' voting preference.

Consequently, while previous scholars have emphasized the effect of mass media echo chambers on voting preference, this study deepened the arguments on the subject by considering it as a mediating factor between biased script assimilation and voting preference. Therefore, this study found that mass media echo chambers significantly mediated between biased script assimilation and voting preference, this result corroborates the conclusion of (Ackermann, Stadelmann-Steffen, 2022) and provides perspective to the study of (Chan et al., 2023) on ways to exploit mass media echo chamber. Considering its level of significance in mediating the relationship between the two variables, it is safe to establish mass media echo chamber as a key factor that influences voters' preference.

The answer to the second research question on whether mass media echo chamber mediates fact-checking journalism and voting preference, demonstrated in Table 2 that the direct model outcome was ($\beta = 220$, $p < .05$); the mediation model result was ($\beta = .192$, $p >. 05$) while the standardized indirect effect outcome (SIE) was $\beta = .035$, $p < .05$).

Therefore, standardized indirect effect findings affirmed that mass media echo chambers mediated significantly between fact-checking journalism and delegates' voting preferences. Albeit the impact of fact-checking on voting preference, the result showed that mass media echo chambers significantly mediated the relationship between fact-checking journalism and delegates' voting preference. It is a response to the recommendation of Chan et al. (Chan et al., 2023) who proposed that the relationship between trust and fact-checking or being in an echo chamber should be further studied. Consequently, this study is a successful attempt to further understand the effect of mass media echo chambers as a mediator which affects fact-checking cum voting preference. Hence, our study supports Törnberg, (Törnberg, 2018) who observes that mass media echo chambers can facilitate misinformation and increase bias and partisanship among voters. Therefore, we recommend in line with other scholars that the use of multiple media platforms as a source of information be adopted as a way to manage the mass media echo chamber effect on voting preference (Dubois et al., 2020).

Table 2. The mediating effect of Mass media echo chamber on the relationship between Biased script assimilation, Fact-checking journalism, and Voting preference

Hypothesized Path	Beta	p	95 % Bootstrap BC CI LB	UB
Direct Model				
Biased script assimilation ⟶ Voting preference	.170	.035		
Mediation Model				
Biased script assimilation ⟶ Voting preference	.150	.083		
Standardized Indirect Effect (SIE)	.031	.031	.001	.107
Direct Model				
Fact-checking journalism ⟶ Voting preference	.220	.006		
Mediation Model				
Fact-checking journalism⟶Voting preference	.192	.070		
Standardized Indirect Effect (SIE)	.035	.046	.001	.073

The outcomes of the third research question which aims to find the individual contributions of the independent and mediator variables on the delegates' voting preference established in Table 3 that the mass media echo chamber as a mediator variable contributed most to the delegates' voting preference. This was because; it contributed 38.8 % effect on the voting preference. This result agrees with the conclusion of (Ackermann, Stadelmann-Steffen, 2022) that the mass media echo chamber is an indispensable asset to voting preference and provides perspective to the study of (Chan et al., 2023) on ways to maximize mass media echo chamber.

The next variable that made a magnitude impact was fact-checking journalism because it was able to contribute a 24.4 % effect on voting preference. Consequently, the study recommends that fact-checking journalism should be given paramount concern in studying factors that affect voting preference. The least was biased script assimilation which made a 13 % impact on the voting preference. However, all three variables were able to collectively explain 39.4 % variance in the delegates' voting preference which can be considered as a moderate effect size as demonstrated by (Preacher, Kelley, 2011).

Table 3. Individual independent and mediator variable contributions to delegates' voting preference

Model	Unstandardized Coefficients (B)	Std Error	Standardized Coefficients (Beta)	t	Sig
1(Constant)	7.103	1.168	-	6.084	.000
Biased Script Assimilation	.061	.025	.130	2.476	.014
Mass Media Echo Chamber	.242	.035	.388	6.980	.000
Fact-checking Journalism	.145	.056	.244	2.614	.009

R-square .394 (39.4)

The last research question that investigated other mediums delegates got news about their preferred presidential candidates during the Nigerian 2022 presidential primary election attested in Table 4 that 33.9 % of delegates received news about their preferred presidential candidate from

media billboards and outdoor advertising. This finding ranks highest when compared with other mediums like meeting and gathering which is pegged at 22.8 %. Former school colleagues, discussion in the offices, community, public transportation system, and restaurant discussion, were the least mediums where they got information about their preferred candidates. This finding supports the conclusion of Schaub and Morisi (Schaub, Morisi, 2020) that mass media echo chambers exist not only in the online world and recent evidence indicates that they might be even stronger in offline social networks (Kofi Frimpong et al., 2022). Therefore, this study recommends that other mass media be taken into cognizance in the study of channels that can influence voting preference for subsequent elections.

Table 4. Other mediums the delegates got the news about their preferred presidential candidates

Items	Frequency	Percentage (%)
Discussions in the offices	22	7.0
Former school colleagues	52	16.5
Media billboards and outdoor advertising	107	33.9
Meetings and gatherings	72	22.8
Our Community	53	16.8
Public transportations	8	2.5
Restaurant Discussion	2	.6

5. Conclusion

Our study evaluated the mediating effects of mass media echo chambers on biased script assimilation, fact-checking journalism, and voting preferences from the Nigerian 2022 Presidential Primary Election Scenario. Additionally, the study examined the individual contributions of the above-mentioned predictors on voting preference and other mediums delegates got news about their preferred presidential candidates during the Nigerian 2022 presidential primary election. The findings to the first two questions on whether the mass media echo chamber mediates the relationships between biased script assimilation, fact-checking journalism, and voting preferences demonstrated that mass media echo chamber fully mediated the relationships between biased script assimilation, fact-checking journalism, and voting preferences, Consequently, while previous scholars have emphasized the effect of mass media echo chambers on voting preference, this study deepened the arguments by demonstrating that mass media echo chamber mediated the relationships between biased script assimilation and voting preference. In other words, this infers that the mass media echo chamber facilitates in contending biased script towards choosing the most preferred candidates in an election. This is because, the echo chamber on social networks, offers users the opportunity to meet people who have the same social ties as them and can share a set of opinions while interacting with viewpoints that contradict theirs (Figà Talamanca, Arfini, 2022).

Furthermore, the mediating effects of mass media echo chambers on the relationships between fact-checking journalism and voting preferences established that mass media echo chambers fully mediated their relationships. This finding supports the study of Törnberg (Törnberg, 2018) who observes that mass media echo chambers can facilitate misinformation clarifications towards choosing the preferred candidates in an election. Therefore, this study recommends that the use of multiple media platforms as sources of information be adopted as a way to manage the mass media echo chamber effect on delegates voting preference (Dubois et al., 2020).

The outcome of the independent and mediator variables' contributions to the voting preference shows that the mass media echo chamber as a mediating variable contributed most to the voting preference. This is followed by fact-checking journalism and biased script assimilation. The result agrees with the conclusion of (Ackermann, Stadelmann-Steffen, 2022) that the mass media echo chamber is an indispensable asset to voting preference and provides perspective to the study of (Chan et al., 2023) on ways to maximize mass media echo chamber.

Finally, the findings on the other mediums delegates got news about their preferred presidential candidates during the Nigerian 2022 presidential primary election revealed that the greatest numbers of delegates got news about their preferred presidential candidate from media billboards and outdoor advertising. This was followed by meetings and gathering forums. Former school colleagues, discussions in the offices, community, public transportation system, and restaurant discussion were the least mediums where they got information about their preferred

candidates. Thus, we suggest that candidates in subsequent elections should maximize using media billboards and outdoor advertising to elicit more votes in the electioneering processes. This finding supports the conclusion of Schaub and Morisi (Schaub, Morisi, 2020) that mass media echo chambers exist not only in the online world. Recent evidence also indicated that an offline echo chamber could be stronger than one on social networks (Kofi Frimpong et al., 2022).

The study also has theoretical implications because it extended cultivation theory by integrating voting preference as an element of the rational decision-making model in evaluating the antecedents of mass media echo chamber effects on voting preference in an election. Thus, it has incorporated voting preference as a factor of cultivation theory; this is because electorates can cultivate information regarding their candidates' preferences in an election via mass media and its echo chambers.

Our study equally has some limitations such as restricting the study to delegates that participated in the presidential primary election. Therefore, extending the study to the presidential general election could help to validate the outcomes of this study since the general public is expected to partake in it. Qualitative studies are also needed to conceptualize other factors that can influence voting preferences in the African continent, especially in the emerging ones.

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Digital Education of Adolescent Children in Modern Conditions

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Abstract

The authors consider digital education in the modern world. They present it as a process of individual development, development and reproduction of cultural values by means of “digital socialization”. The purpose of the manuscript into comprehensively characterize the process of digital education of an individual, identify its positive and negative components, and provide important recommendations for the safe and competent finding of a child in the digital world. Systematic, axiological, and cultural approaches serve as the methodological basis of this article. Theoretical (analysis of scientific papers; comparison, synthesis), as well as empirical (observation, survey, testing) were used in the preparation and writing of this article. The authors pay special attention to the positive aspects of digital education, namely: the formation of independence of children and adolescents, saving money and time, powerful prospects for personal growth and human intelligence. The main recommendations for the implementation of the tasks of digital education are the study of the rules of respect and trusting dialogue in the digital environment; the creation of productive conditions for positive interaction between students; the maximum use of digital technologies in extracurricular activities; the organization and conduct of various educational activities. This manuscript maybe useful for teachers, classroom teachers, and educators when organizing work with students on digital education.

Keywords: digital education, digital socialization, adolescent children, various educational activities.

1. Introduction

When it comes to children and adolescents, we are talking about a relatively new and sometimes extremely dangerous territory called “digital spaces”. They may encounter cyberbullying or sexual harassment on the World Wide Web, for example. Most countries simply do laws and regulations to regulate what is happening on the Internet. The necessary documents were not available at the international level until recently.

The rights of children in the digital environment are not defined in the 1989 Convention on the Rights of the Child. Meanwhile, in March 2021, experts from the United Nations Committee on the Rights of the Child published a new document entitled “General comment No.25 on the rights of the child in the digital environment". It became an addendum to the Convention on the Rights of the Child. Countries should be directly responsible for the systematic supervision of children's presence in the digital world. States should also en sure their rights on the Internet (United Nations, 2021).

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The general comment was prepared following two years of consultations with representatives of States, intergovernmental organizations, national human rights institutions, civil society and, most importantly, children (United Nations, 2021).

“Children's rights must be extended to the digital world. It surprises me that this has not always been the case. For some reason, we did not remember about the rights of children during the development of digital technologies”. Biban Kidron, a British human rights activist, says so (United Nations, 2021). She heads the 5 Rights Foundation. He is engaged in reforming the digital space in the interests of children and youth.

More than 700 children and young people aged 9 to 22 from 27 countries answered questions about the impact of digital technologies on their lives.

“It is extremely important that we, young people, have the right to vote in everything that concerns us. We speak from personal experience, so we need to be listened to”, 19-year-old Mairead Reid from Scotland says. She took part in the creation of the new leadership (United Nations, 2021).

During the development of new recommendations, children and adolescents not only acted as consultants. They also prepared a special, simplified version of this document for their peers called “In Their Own Words”.

“Our participation gives adults the opportunity to hear our opinions”, 19-year-old Mason Rickard from England says (United Nations, 2021).

“It would be wrong to prepare a document on children's rights in the digital space, which is incomprehensible to children themselves because of the use of legal terms or complex language. “In his own words," he helps children understand the essence of the “General comment” and enjoy their rights”, heads (United Nations, 2021).

The purpose of the manuscript is to comprehensively characterize the process of digital education of an individual, identify its positive and negative components, and provide important recommendations for the safe and competent finding of a child in the digital world.

Stages of the study:

Stage 1 – definition of the essence and means of digital education of children and adolescents; identification of positive and negative aspects during its implementation.

Stage 2 – substantiation and presentation of the most important pedagogical recommendations for the productive implementation of digital education of young people.

Stage 3 – promotion of the ideas of competent finding and staying of children and adolescents in the modern digital world.

2. Materials and methods

Science in the modern world has a rich and extensive experience of the essential foundations of the problem of digital education under consideration.

This problem was raised in the work of T. Romm, M. Romm “Education in the digital age”. The authors discuss educational transformations in the context of the impact of digitalization on the development and socialization of youth, as well as their relationship with educational practices. They analyze various goals and objectives of education in the context of digitalization, and also identify the leading components of the transformation of modern educational practice (Romm et al., 2021).

A. Safronova, N. Verbitskaya, N. Molchanov in their work “Education in the digital space: self-preservation of health” is considered a short-term prospect for the development of education in a digital environment, the creation of a virtual educational environment for the organization of modern educational activities (Safronova et al., 2018). The authors define the cognitive, value, activity and behavioral components of educational work.

Yu. Sharonin in his article “Digital education in modern education” tells about the formation of a digital society in modern conditions and the need to master the full range of competencies for full participation in it. Healsonotes the formation of a digital life style as an important element of modern communication and the change in traditional forms of socialization of the younger generation – from the intensive formation of the media space (television, mass media) to the use of innovative Internet technologies (Sharonin, 2023).

The general scientific systematic approach on the relationship between the digital environment and the development of education as an integral system (Abramenkova, 2020), the axiological approach on the need to consider the value-semantic aspects of pedagogical

definitions and identify the socio-educational conditions of the digital environment, the competence approach as a consideration of educational practice through the formation of students' competencies formed the scientific and methodological basis of this manuscript.

The definition of manuscript methods is characterized by the features of the object and subject of research, the tasks set. Theoretical methods were applied: analysis of information, its systematization; empirical methods: generalization and presentation of modern pedagogical experience, conversation using remote technologies, description of the results obtained, qualitative analysis of the results. The above methods were used in order to generalize, identify the educational potential of digital education and its features in modern conditions.

3. Discussion

A reading of modern literature on digital education issues show sits isolation into an independent object of humanitarian scientific research. Digital technologies are studied in the context of information processes of personality socialization (V. Pleshakov, V. Pustovoitov, I. Robert), expanding the tasks of social education in modern society (A. Mudrik, Rischev, T.A. Romm, etc.), as well as a means of educational activity (L.S. Kruglikova, A.V. Fedorov, etc.).

Thus, the researchers focus on the possibilities of ICT and the digital environment and theirs ignificance for the socialization of adolescents and the development of their personality (Gálik et al., 2024; Gálik, Gáliková Tolnaiová, 2022).

The subject of modern works is the issues of socialization of adolescents through the Internet; all kinds of risks and the negative context of the use of electronic gadgets; information and communication technologies in education (the emergence of a separate branch of scientific knowledge digital education); information and communication technologies in education. We particularly note the work on the study of social networks and their potential for educational purposes.

The experience of studying foreign education systems using digital content has become the subject of research by individual authors (B.Wolfson, L.Gurye). The works of modern researchers on various issues of digital education abroad A. Dzhurinsky, Z. Malkova, V.I. Petrishchev are of great importance.

The analysis of research on this issue indicates the insufficiency of developing the problem of digital educationas a pedagogical condition from the point of view of positive socialization (Petrushkevich, 2020).

Therefore, addressing this problem once again and introducing it into scientific circulation can be useful.

4. Results

The digitalization of society is gaining serious momentum the moment. People should master the entire list of necessary skills and abilities for a full life in it (Uvarov et al., 2019). The old forms of socialization change every day. Going back from media technologies (television, press, cinema) to the most modern Internet technologies, they are designed to make life more comfortable and better for citizens.

Communication in the digital world is becoming an important factor in the formation and development of an individual. The importance of defining all the components of this process arises in the process of implementing the goals and objectives of education. Therefore, digital education defines the entire list of means and methods of its implementation with the active use of an arsenal of digital resources (Vikhmaney al., 2021). It is defined as the process of an individual's development, development and reproduction of cultural values by means of “digital socialization”. Adolescents and young people should actively use all possible channels and streams of digital information for reasonable purposes.

The virtual and real worlds are now practically blurring the lines between each other. In the real world, an individual accumulates life experience over a long period of time. G. Soldatova conducted a study and concluded that only 44 % of the surveyed teenagers and 71 % of their parents live in the real world (Solodnikov et al., 2021).

If children spend more and more time in the digital world, it means that they are comfortable there, they feel great and do not have a shortage of the real world.

Fig. 1. Positive aspects of digital education

Digital education is a relatively young area of pedagogy. It is only being created at the moment. This direction presents the pedagogical community with a number of specific problems and tasks. These are aspects of cyber security, digital socialization and, of course, urgent tasks for the preservation and preservation of mental and physical health exist. The Internet is a habitat for children, a source of personal development, and an important condition for digital socialization. They allow us to take into account the diversity of the reality of the digital life style.

Digital socialization is the process of mastering and reproducing a teenager's social experience from mixed reality and virtual communication (Voropaev, 2011). It forms its digital component as an integral part of the real one.

Modern researchers note the positive aspects of digital education.

Along with this, the “cons” of children's digital reality also and out.

There are certain risks in the process of internal development of the younger generation:

–The growth of addictions is present (the personal and semantic sphere of students is most susceptible to their safe development and is subject to certain risks of safe development). Over the past 10-15 years, the restructuring of youth addictions has occurred. They have changed from the use of chemical drugs to visual and digital ones. Children's development occurs when they absorb the negative content of television, and then computer games, the Internet, social networks, and various chats.

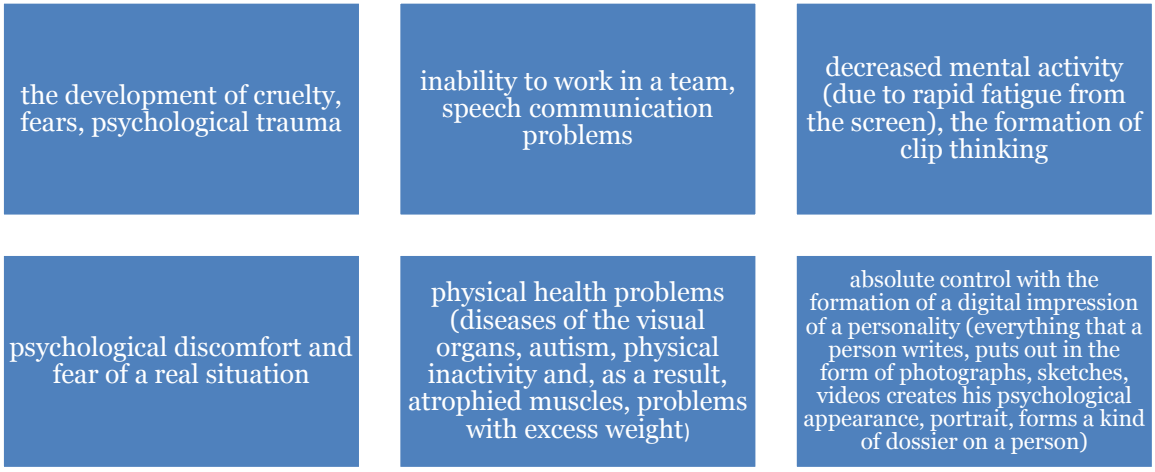

Fig. 2. Negative aspects of digital reality

Statistics on Internet use by teenagers are disappointing:

– Approximately 50 % of teenagers use the Internet without adult supervision;

– About 20% of teenagers sometimes browse erotic sites, about 9 % of children do it all the time;

– 38 % of children are interested in scenes of violence on the Internet;

– 20 % of children are interested in the radical extremist content of different pages;

– 25 % of five-year-olds already use the Internet;

– 15 % of teenagers met and came to meet strangers on the Internet.

Electronic child drug addiction is practically not cured:

– Currently, society still does not understand the complexity and contradictions of this phenomenon. Children do not wander, do not engage in antisocial activities, they are at home, working on a computer.

– "Computer" children are not aware of their addiction and do not want to get rid of this type of "disease".

The problem of child protection on the Internet finds the widest resonance.

Increasing the time spent on the Internet, reducing the time spent in reality brings the greatest harm to the family and friendly relations of children. Prolonged use of the Internet by children and adolescents leads to the formation of psychological dependence.

The digital world presupposes serious problems.

Children encounter them online.

These problems differ not only in their essence, but also in the methods of solving them.

We will list the main problems.

*1. Phishing*is gaining access to personal data through fake websites. They most often imitate the pages of famous people or companies. In these cases, requests for help from friends and acquaintances are often received.

2. Online grooming(English groom–grooming) is the establishment of friendly and emotional contact with a child on the Internet for his further sexual or criminal exploitation. Attackers often in personate children or a child-friendly personality on the Internet. The main stages of this type of crime:

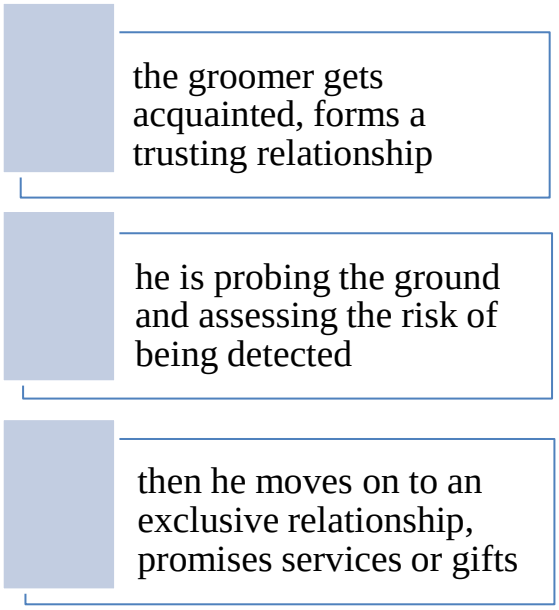

Fig. 3. The main stages of online grooming

More often than others, insecure and self-checking teenagers become victims of groomers, and girls are in the zone of special attention.

*3. Inappropriate content for children.*It distorts the child's psyche, forms a distorted view of reality and moral norms. For example, early contact with pornography provokes increased sexual

aggression and a frivolous attitude towards sexual contact. And scenes of violence form fear for the safety of one self and loved ones, depression arises, insecurity, social phobias.

4. Clipthinking. The formation of clipthinking, which reduces children's ability to analyze information, master knowledge, and academic performance, is one of the negative aspects.

Clipthinking reduces the quality of learning and le ads to a drop in the child's academic performance.

The information diet is an effective means of avoiding clip thinking. We will list its main components. This is, first of all, setting goals and having a clear plan of action in the process of searching for information. Here, distraction to offline activities (children's associations, sections, volunteer activities) is possible. They will form clear needs for necessary and useful information and being online for a specific purpose. Teachers should introduce teenagers to new useful and positive resources, conducton line quests, and online clubs.

5. The digital footprint of the individual. Each person leaves a cast on the Internet with various posts, letters, abstracts, and photographs.

The digital impression of an individual is formed in this way. A digital impression allows you to create a psychological portrait of a person.

The protection of personal data allows you to keep information secret, not harm his civic position and protect yourself from illegal actions.

6. Gambling addiction. The concept of "gamblers" is actively appearing in the modern world.

Teenagers experience powerful sensations in a computer game. In this regard, children with a lack of positive emotions in real life, sufficient communication and interaction with their parents are most often victims of computer games.

The players demonstrate a cold mind and unflappable emotions towards other people's suffering, aggression. Aggressiveness and the male hunting instinct actively grow on the fertile soil of computer games. This is reinforced in cases where the opportunity to play regular games is not provided.

About 30 % of illegal actions occur due to the negative impact of computer games and the Internet.

Doctors have been treating gambling addiction for the last 7-8 years. It gets sharper every year. Doctors mostly treat teenagers over the age of 12. Boys are mostly among the patients.

Specifically, the main problems result in real illegal actions:

1. Bullying and harassment of children online by peers and strangers.

2. Hacking accounts, stealing money and personal data of teenagers.

3. The involvement of teenagers in radical extremist activities (radical groups, deaths, drug advertising, their distribution).

4. Familiarization of children with negative information that has a bad effecton the child's psyche. Experts in the field of digital literacy summarize the experience of various countries and offer the following recommendations on how to stream line the stay of children on the Internet (Polivanova et al., 2016).

We are considering the experience of foreign countries in the presence of children on the Internet.

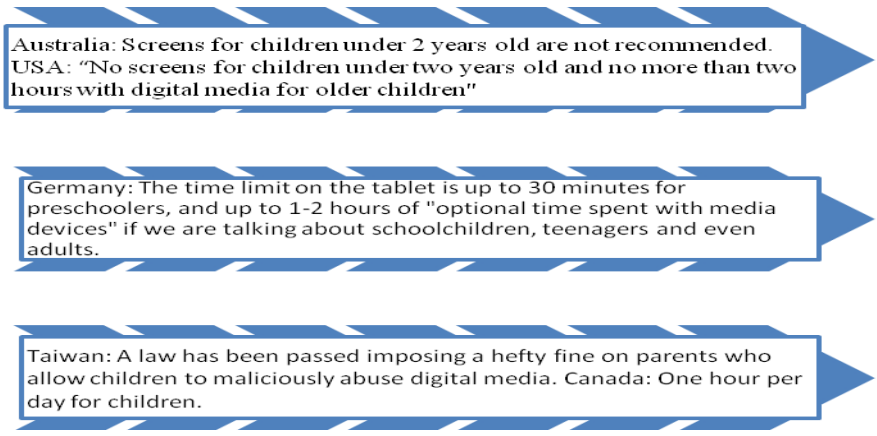

Fig. 4. The experience of foreign countries in thepresence of children on the Internet

5. Conclusion

We offer basic recommendations on the issues of digital education of the younger generation:

1. Learning the basics of respectful tone in the digital environment as an important element of civil culture and ethics:

–Business games “Ethic sand dialogue on the Internet ”in the process of educationalwork;

– The use of video clips with respectful interaction of teenagers in gaming activities;

– Respectful attitude towards ach other, the requirement to use the rules of respectful dialogue.

2. Creating conditionsin the digitals pace of educational activities for the formation of mutual respect and positive interaction of students:

– Work in pairs, problem groups, groups in the educational process when performing various tasks and assignments;

– Development of creative projects in net working;

– performing practical creative tasks using digital tools.

3. The use of digital technologies in extracurricular activities:

– Social media groups, chat rooms, various forums using positive interaction experience;

– Flash mobs, social actions in the Internet, Internet Olympiad;

– Support for the achievements of individual students, including those with disabilities, on the Internet.

4. Educational activities and social actions:

– Volunteer movement to provide voluntary feasible assistance to students, disadvantaged categories of the population,

– Participation in competitions at the municipal, regional and federal levels,

– Discussion with students of their positive actions, the actions of other people on the Internet.

5. Organization of pedagogical communication with students on issues of interaction and relationships with others.

Thus, an important goal of digital education is the formation of a digital culture of the younger generation. The core principle in digital education is the priority of spiritual and moral traditional values. They should become the foundation for creating positive content for the development of a teenager's personality and are the key to education in the era of digitalization.

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The Use of Game Technologies in Teaching Professional Communication in English for Engineering Students

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Abstract

Our research focuses on the innovative application of gaming technologies in the instruction of English for future professionals in the mining industry management sector. The primary aim of our study is to assess whether integrating gaming elements into educational practices enhances overall learning effectiveness. Additionally, we seek to explore the potential benefits of educational games as a viable tool for skill acquisition. To elevate the quality of professional communication training, we developed a tailored model specifically designed to cultivate English communication skills among students pursuing degrees in economics, particularly in the management of mining enterprises. This model incorporates various educational games that simulate real-world scenarios, allowing students to engage in practical exercises that mirror the challenges they will face in their careers. The implementation of this model took place from September 2022 to February 2023. The conducted experiment demonstrated the effectiveness of the game-based teaching approach to overcome the language barrier, increase motivation and improve foreign language communication skills on professional topics. The analysis of the results of the empirical findings and the answers to the questionnaire confirmed the hypothesis about the efficiency of application of the developed model for successful teaching of communicative skills in English to future specialists in the field of mining enterprise management.It was also found that teaching English applying game-based approaches can be considered an important instrument for the enhancement academic motivation in students of economic and engineering profiles.

Keywords: game technologies, efficient educational process, professional communication skills, enhanced motivation.

1. Introduction

The purpose of forming partnerships with foreign companies, particularly in areas related to natural resources, remains a priority for achieving successful economic growth.There is the need to train future engineers who can be qualified specialists in terms of professional competence and will be able to successfully communicate in a foreign language. The strategy of international activities of Mining University is aimed at training highly qualified “mining specialists” (Kazanin et al., 2017:369) due to the urgent need.

Since the successful functioning of enterprises of the mineralsextraction and processing is “one of the factors of sustainable development of the country” (Khrustaleva et al., 2021: 417), there is a necessity ofskilled professionals who can communicate proficiently in English. As the language of international trade, research, and collaboration, English has become indispensable for professionals in the mining and minerals industry.

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In the realities of modern requirements for mineral resource companies, there is an urgent need for high level specialists who will not only have excellent knowledge of their specialty, but will also be able to successfully exchange experience with foreign colleagues. So, “technical university students’ creativity development” (Borisova et al., 2022: 130) can contribute to the formation of a specialist who meets these demands.

It's no secret that a successful manager needs to have such a level of knowledge that will help him/her to be able to interact with counterparts worldwide on a professional basis (Oblova, 2023).

However, during the process of teaching foreign languagessome difficulties remain. Problems with motivation and time management, as well as inability to handle the task properly are just some of them (Borschenko, 2020; Medvedeva et al., 2022).

We can explain it by the fact that teaching methods are often focused on mechanical memorization of terms and basic grammatical structures, and the learning process often turns into a poorlyorganized and boring routine (Baranova et al., 2020).

Since the university classroom isthe most suitable and comfortable space for improving professional communication skills (Krylov et al., 2022), the ways to create a comfortable and stimulating learning environment are constantly being developed, and new methods of intensifying the educational process are being sought (Dorofeev et al., 2023; Ovchinnikova et al., 2023).

It is now impossible to discuss education process without taking into consideration the use of ICT technologies. “As the educational process becomes more innovative and creative, it is essential to improve the means and methods used in it. The crucial role in this process is played by the use of creative techniques” (Boyko et al., 2022: 40).

“Nowadays there is an urgent need to use new methods and techniques of teaching a foreign language, which, unlike traditional methods, are based not only exclusively on learning to read and translate and studying grammatical rules” (Gerasimova et al., 2022) and to acquire skills “in the search and implementation of advanced technologies” (Litvinenko et al., 2020: 435).Interactive approaches that help to enhance the ability to effective communication in a foreign language are mandatory for use in modern conditions of informatized society (Almazova et al., 2020).

In such situationit is important to meet existing challenges, and,in our opinion, the thing that can be helpful is the use of game techniques. In today's environment, the rules of the game are increasingly penetrating where previously they seemed to have no place (Dreimane, 2022).

Under such circumstances, any teacher is required to have additional special skills aimed at organizing educational process taking into consideration the laws of games. “Gamification” is a method that uses the rules of a game to achieve real-world goals. In other words, it makes boring tasks interesting, undesirable things desirable and difficult tasks simple.Nowadays learning process is already partially “gamified”. If a student does an exercise correctly in class, he or she gets a good grade. If the students make a few mistakes, they get a bad grade. At the end of each university year, students move up to the next grade level.

In this study, the authors analyze the application of the specially designed model of the use of educational games for the development of professionally significant qualities in future managers of mining enterprises.

The authors considered the methods of using different types of communicative games to develop communication skills in various situations, including interpersonal, daily and household interactions, as well as situation-based games to improve professional communication abilities.The use of role-playing games in the formation of skills for effective management of a mineral complex is also of great significance.The analysis emphasizes the effectiveness of the implemented model and contributes to the methodology for teaching foreign languages to future engineers and managers at mining industry through the use of gaming technologies. The relevance of this research lies in its potential to enhance the quality of the educational experience for students and contribute to the training of future specialists.

Theoretical background

Teachers at Saint Petersburg Mining University are trying to investigate the questions connected with use of unconventional technologies in foreign languages teaching. “Artificial intelligence tools in teaching a foreign language” are studied by E.N.Nikonova (Nikonova et al., 2023). “Enhanced terminology acquisition” is explored by E.R. Skornyakova (Skornyakova,Vinogradova, 2021: 240). O.Yu. Kharlamova examined “vocational oriented foreign language reading to future oil field specialists” (Kharlamova et al., 2023).

Taking into account above mentioned challenges, the aim of our research is to analyze the formation of communicative skills on professional topics of future managers of mining enterprises through various games in English.

The methodological basis of our research is the works of L.S. Vygotsky (Vygotsky, 1956), the papers of A.A. Leontiev (Leontiev, 2000) and I.A. Zimnya (Zimnya, 1999); as well as the studies of A.A. Verbitsky (Verbitsky, 1991) and D.B. Elkonin (Elkonin, 1978).

The theoretical basis consists of E.I. Passov's methods of teaching successful communication in a foreign language (Passov, 1989), as well as I.L. Bim's "principles of foreign language teaching theory and methodology" (Bim, 1988), leading among which are the following – communicativeness, professional orientation and activity.

The principles and concept of game were defined by C. Salen and E. Zimmerman (Salen, Zimmerman, 2003); five categories of games were classified, and the term gamification was specified by Deterding et al. (Deterding et al., 2011); various terms for description of game-based learning or teaching practices have been investigated by Y. Gao and E. Gee (Gao, Gee, 2023).

The use of the games for overcoming psychological problems, the application of game activity to explain the world around us, and, in addition, the use of them for recreation and as a means of competitiveness were considered in a number of works (Klimova, 2015; Kovalenko, Skvortsova, 2022).

We can find the authorswriting about "the use of game technology for developing lexical skills" (Thiagarajah et al., 2022) and for improving "teamwork, critical thinking and self-learning" (Kapp, 2012). The research of Waluo and Lealwas devoted to the "impact of gamified vocabulary learning" (Waluo, Leal, 2021). Chen analyzed "the necessity to use games for enhancing students' self-organization and personal responsibility for learning outcomes" (Chen, 2018).

It can be concluded that many researchers consider the game as a complex skill inherent in humans since ancient times. Games help to develop intellectual level, improve psychological and personal characteristics, and accordingly are an integral part of the educational process, including foreign language learning.

2.Materials and methods

Our study was conducted from September 2022 to February 2023. The research platform was Saint Petersburg Mining University.This study aimed to compare the effectiveness of a game-based learning approach with a traditional methodology in teaching English to economic students. Two groups, each comprised of 30 students aged 17 to 19 years old with B1 level English proficiency, were selected for this research. The experimental group, consisting of first and second-year economic students of both genders, engaged in an educational program that incorporated communicative, situational, and role-playing games. These games were specifically designed to enhance interpersonal and professional communication skills, as well as to develop managerial competencies relevant to the mineral and raw materials sector. This approach aimed to create a more engaging and interactive learning environment, fostering active participation and collaborative learning. The control group, also consisting of first and second-year economic students with the same characteristics, followed a traditional educational process with minimal use of games. This group served as a baseline for comparison, allowing us to isolate the impact of game-based learning on language acquisition and skill development.

A comprehensive research methodology was employed to gather and analyze data. This included a thorough review of existing literature on the use of creative teaching methods in education, particularly focusing on game-based learning and its implementation in foreign language classes at non-linguistic universities.

The study further analyzed existing classifications of games and explored effective methods and techniques for incorporating game-based learning into the educational process. The study involved close monitoring of both experimental and control groups, including experimental training sessions where the effectiveness of the game-based approach was actively observed and assessed. A questionnaire survey was conducted to gather feedback from participants on their experience and to evaluate the success of the experimental program. Data collected through these methods was processed and analyzed using statistical software such as SPSS 17.0 (IBM) and Microsoft Office Excel 2017.

This enabled us to generate graphs and other visual representations to illustrate the results of the study and draw meaningful conclusions about the relative effectiveness of game-based learning compared to traditional methods. By comparing the outcomes of the experimental and control

groups, this research aimed to provide empirical evidence on the benefits and drawbacks of game-based learning in the context of English language teaching for economic students. The findings could contribute valuable insights for educators and curriculum developers seeking to enhance the learning experience and promote deeper understanding in foreign language classrooms.

To improve the quality of foreign language instruction, we developed a pedagogical model aimed at fostering professional communication skills in a foreign language among students at the Mining University. This initiative was implemented at the Foreign Languages Department of St. Petersburg Mining University, with the collaboration of three faculty members from the department and a representative from Peter the Great St. Petersburg Polytechnic University. The participants included first-year and later second-year students who were pursuing an economic profile. The implementation spanned a year and a half, from September 2022 to February 2023.

The primary goal of introducing this model into the educational framework was to assess whether the integration of game-based learning technologies could significantly enhance the effectiveness of the language acquisition process. We aimed to analyze not only the practicality of using educational games in foreign language instruction but also their impact on student engagement and motivation.

During the pedagogical experiment, various educational games were employed, ranging from role-playing scenarios to interactive language quizzes. These games were designed to simulate real-life professional situations, encouraging students to practice their language skills in a contextual and engaging manner. Furthermore, we incorporated feedback mechanisms to gauge student responses and adapt the games to better suit their learning needs.

Our findings indicated a marked improvement in students' communication abilities and overall language proficiency. The interactive nature of the games fostered a collaborative learning environment, allowing students to build confidence in their language skills. This model not only demonstrated the potential of educational games in enhancing language learning but also opened avenues for further research into innovative teaching methodologies that could be applied across various disciplines.

Table 1. Model of formation of professional communication skills in a foreign language among students of St. Petersburg Mining University with the use of educational games

Modeling of communicative activity in a foreign language	*Purpose and content of professional-communicative training*	*Types of educational games*
The formation of skills to conduct household discussions in a foreign language	Formation of communicative skills of discussions in a foreign language (interpersonal communication at the household level)	Communicative games
The formation of skills to conduct professional discussions in a foreign language	Formation of skills of communicative activity in English for interpersonal communication at the professional level.	Communicative games; situational games
The formation of skills necessary for successful management of mining and mineral raw materials processing enterprises	Formation of skills for managingactivity of an enterprise of the mineral complex with the help of means and methods of a foreign language	Role-playing games

Source: compiled by the authors

The primary aim of implementing this educational model was to assess how the incorporation of games affects the engagement and activation of the learning process among students. We sought to explore whether this playful approach enhances both motivation and the

eagerness to communicate in a foreign language. Additionally, it was crucial to identify which specific types of games could be effectively integrated into textbooks for practical classes, particularly in relation to preparing students for their future careers that require proficiency in a foreign language. In the study, we established a control group that followed a traditional teaching method, utilizing the same lexical and grammatical content as the experimental group. However, the key distinction was the absence of game elements in the control group's tasks. This allowed us to draw clear comparisons between the two groups. Our findings revealed that interactive games not only fostered a more dynamic learning environment but also significantly increased students' willingness to participate and practice their language skills. Furthermore, we discovered that incorporating various game formats – such as role-playing, quizzes, and collaborative challenges – can greatly enhance language retention and practical application, making learning both effective and enjoyable.

Communicative games

Communicative games included tasks such as filling in information gaps, searching for information, guessing sentences, or answering questions. They also had quizzes and questionnaires to test knowledge and understanding. These activities encouraged students to actively participate and motivate them to learn more about unfamiliar topics and events. They also encouraged students to share their knowledge by asking and answering questions and finding missing information.During communicative games, discussions arose due to differences in how information was presented. These differences were based on the significance of the information. In these discussions, participants explained or argued their individual, paired, or group positions.

"Agree or Disagree" activities, which encouraged students to express their opinions using all available language skills, were also a great example of communicative learning.

Situational Games

The use of situational and game-based methods in teaching a foreign language allowed the teachers to engage the students and stimulated their interest in mastering the material. This approach also enabled the teachers to find innovative methods for accessing necessary information, which could generate additional motivation among students, something that they often lacked.

There were various types of scenarios available, including advanced scenarios that provided a brief description and required the students to develop the situation, and complex scenarios that presented a problem that students had to identify and propose solutions for.

When using situational games, participants interacted in an environment that closely resembled real-life communication, with its distinctive features such as emotional engagement and purposeful linguistic structures.

Role-playing games

Using role-play, students enacted fictional scenarios in the form of dialogue or debate. This provided a valuable opportunity for students to enhance their vocabulary and grammatical skills in a range of settings, both in everyday life and in professional contexts such as business meetings and job interviews. A successful role-play scenario required a well-structured plot that served a specific communication goal, as well as a configuration of characters and interactions between the participants. These characters and their interactions could often be complex and contradictory. When students selected a role, they could portray a character or represent themselves in a given scenario.

3. Discussion

The findings of the study revealed a notable enhancement in vocational vocabulary among participants after they engaged in gamified exercises. This aligns with previous research that has demonstrated improvements in lexical skills resulting from the incorporation of gaming techniques into educational settings.

Notably, earlier studies primarily focused on general vocabulary acquisition and utilized gamification tools either in traditional classroom environments (Thiagarajah, 2022) or through specific applications used at home (Waluyo, Leal, 2021). In contrast, the current study employed communicative, situational, and role-playing games, which suggests that varying types of games and learning contexts can significantly contribute to the vocabulary development of engineering students.

An essential aspect highlighted during the experiment was the increase in motivation to learn a language. This finding resonates with other research indicating that games can have a positive influence on student motivation (Kovalenko, Skvortsova, 2022). When students are engaged in an enjoyable and interactive learning experience, they are more likely to participate actively and invest

effort into mastering the material. This motivational boost is particularly crucial in language learning, where consistent practice and engagement are key to achieving proficiency.

Another noteworthy outcome of this study was the increase in the rate of speech among engineering students, a factor that has often been overlooked in previous research on gamification in language education. This innovative approach underscores the potential of gamified learning environments to not only enhance vocabulary but also improve fluency and communication skills. The emphasis on communicative games is particularly important in developing professional skills in English, as effective communication is a vital competency in the engineering field and many other professions.

Furthermore, the study supports the effectiveness of situational and role-playing games in cultivating language skills within authentic contexts. By simulating real-life scenarios, these types of games allow students to practice language use in a manner that mirrors actual professional interactions. This experiential learning aligns with the situational approach to teaching, which emphasizes the relevance of context in language acquisition.

Despite the significant results, the study did have some limitations. The relatively small sample size of 30 students in both the experimental and control groups may have impacted the generalizability and validity of the conclusions drawn. Future research could benefit from larger sample sizes and a more diverse participant pool to further validate the findings.

Additionally, exploring the long-term effects of gamified learning on language retention and application in professional settings could provide deeper insights into its effectiveness. In conclusion, this study contributes to the growing body of evidence supporting the use of gamification in language learning, particularly for vocational contexts such as engineering. By demonstrating improvements in vocabulary, motivation, and speech fluency, it highlights the multifaceted benefits of incorporating games into educational practices. As educators continue to seek innovative ways to engage students, the integration of communicative and role-playing games may prove to be a valuable strategy in fostering language proficiency and professional readiness among students.

4. Results

Our educational experiment at St. Petersburg Mining University showcased the effectiveness of a new pedagogical model that focuses on enhancing students' professionally oriented foreign language communication skills through the use of educational games. The study specifically targeted students preparing for careers in the mineral industry, aiming to improve their English communication abilities.

To evaluate the impact of game-based learning on these students, we conducted a thorough post-experimental assessment comparing the performance of students in both experimental and control groups. Additionally, a questionnaire survey was administered to students in the experimental group to gather their feedback and insights. Throughout our research, we delved into various key indicators that reflect speech skills, such as speech rate, the accurate use of fundamental grammatical structures, and the seamless integration of industry-specific vocabulary.

To process and visualize the gathered information, we utilized computer programs like Microsoft Excel 2017 and SPSS 17.0 (IBM). The data analysis process involved a thorough examination of the distribution of various features, with a focus on key statistical indicators such as asymmetry and kurtosis. These metrics help us understand the overall shape of the distribution curve, providing insights into the data's characteristics.

To present our findings clearly and consistently, we utilized a standardized format that displays values as $M \pm SD$, where M stands for the sample mean and SD represents the sample standard deviation. This format enhances the clarity of our results, making it easier for readers to grasp the central tendency and variability of the data.

To compare averages and evaluate the statistical significance of our findings, we employed several statistical tools. The Student's T-test was particularly useful for analyzing normally distributed data with equal variances, allowing us to draw meaningful comparisons between groups. Additionally, we utilized the paired Student's T-test for related samples, which is essential when assessing the same subjects under different conditions. To further ensure the robustness of our results, we applied Fischer's F-test to examine the equality of variances across groups. Our analysis uncovered statistically significant differences at a significance level of $p < 0.05$, indicating that there is a less than 5 % probability of making a Type I error when rejecting the null hypothesis.

We maintained a consistent application of two-sided tests throughout all analyses, which is crucial for a comprehensive evaluation of the data. This rigorous methodology enabled us to draw strong conclusions about the effectiveness of game-based learning in enhancing professional communication skills among future professionals in the mineral industry.

Moreover, incorporating additional factors such as the type of game-based learning used, the duration of the intervention, and participant demographics could provide deeper insights into the nuances of our findings. Future research could explore these variables to further understand how different approaches to game-based learning impact communication skills development in various contexts.

The statistical analysis of the data gathered during the study revealed that the speech rate in the experimental group was 19 % higher than that of the control group, with a significance level of $P < 0.001$. This notable difference underscores the effectiveness of employing game-based techniques in educational settings, which resulted in nearly a twofold increase in speech rate compared to traditional teaching methods.

Importantly, as the rate of speech improved, there was a corresponding decrease in the number of unnecessary pauses during speech, indicating a smoother and more fluid communication style. When examining grammatical correctness, the experimental group did not show a statistically significant difference from the control group, although there was a noticeable trend favoring the experimental group, with a 9% difference ($P=0.070$). This suggests that while the game-based approach may not have significantly improved grammatical accuracy, it did not hinder it either, allowing students to focus on fluency and expression.

Table 2. The analysis of statistical data in the control and experimental group

Statistical characteristics	*Rate of speech*	*Correct use of grammatical constructions*	*Fluent mastery of professionally oriented vocabulary*	*Lexico-grammatical test*
Control group (n=30)				
M	3,70	3,83	3,83	3,73
SD	0,65	0,75	0,65	0,74
Experimental group (n=30)				
M	4,40	4,17	4,37	4,13
SD	0,62	0,65	0,67	0,57
P	*<0,001*	*0,070*	*0,003*	*0,023*
Difference, %	19 %	9 %	14 %	1 1%

Source: compiled by the authors

Notes: P is the statistical significance of the difference in averages between the control and experimental groups.

Moreover, the experimental group exhibited a statistically significant advantage in their fluency with professionally oriented vocabulary, outperforming the control group by 14 % ($P = 0.003$). This indicates that the integration of game techniques not only enhanced the rate of speech but also enriched the students' vocabulary, which is crucial for effective communication in professional contexts.

A comparative analysis of vocabulary and grammar assessments further corroborated the effectiveness of the proposed teaching model. The experimental group's performance in these assessments was statistically significantly better by 11% compared to the control group ($P = 0.023$), reinforcing the idea that innovative teaching strategies can lead to improved learning outcomes. An essential aspect of successful learning is student motivation. To assess this, a post-experimental survey was conducted to evaluate general learning motivation among students. The results indicated a 14 % increase in motivation levels within the experimental group, in contrast to an 8 % increase observed in the control group. This boost in motivation can be attributed not only to the engaging nature of the subject matter but also to the effective teaching methods employed.

These methods encouraged the development of students' creative and critical thinking abilities, which are essential in today's learning environments. The use of games in education is built on principles of collaboration, teamwork, and active participation, allowing students to engage fully and express their creativity in a dynamic setting.

This approach fosters a sense of community among learners and promotes an enjoyable learning atmosphere, which can significantly enhance the educational experience. Furthermore, the incorporation of game-based learning strategies aligns well with contemporary educational theories that advocate for experiential learning. By allowing students to immerse themselves in practical, real-world scenarios, they can develop not only their language skills but also soft skills such as problem-solving, adaptability, and effective communication. In conclusion, the findings of this study highlight the positive impact of game-based learning techniques on speech rate, vocabulary fluency, and overall student motivation.

The results suggest that such innovative approaches can be instrumental in enhancing the learning process, making it more effective and engaging for students. As educational methodologies continue to evolve, integrating playful and interactive elements into the curriculum may pave the way for more robust and comprehensive learning experiences, ultimately preparing students for success in their professional endeavors.

The evidence presented here advocates for further exploration and application of these techniques in various educational contexts to maximize their benefits.

Table 3. The analysis of the questionnaire survey answers in the experimental group

Question	*Completely disagree*	*Almost agree*	*Completely agree*	*Undecided*
The use of games was useful for memorizing speech material	-	15 (50 %)	12 (40 %)	3 (10 %)
Games help to overcome the language barrier	-	18 (60 %)	11 (36.7 %)	1 (3.3 %)
Game activities influence the development of your attention and memory	1 (3.33 %)	16 (53.33 %)	9 (30 %)	4 (13.33 %)
Game-based foreign language class structure had a greater impact on your motivation to learn a foreign language	-	17 (57 %)	10 (33 %)	3 (10 %)
Games help to improve your reading, writing, listening and speaking skills	-	16 (53.33 %)	10 (33.33 %)	4 (13.33 %)
The use of games improves your understanding of grammar rules and vocabulary	1 (3.33 %)	17 (57 %)	11 (36.6 %)	1 (3.33 %)

As we can judge from the results of the received answers, the most of the respondents consider the use of game technologies appropriate and effective, and,as we can see, it confirms the effectiveness of the use of game-based techniques in foreign language lessons for students of technical universities.

5. Conclusion

The findings from the experimental study clearly indicate that integrating game techniques into the educational framework offers numerous significant benefits. These methodologies not only enhance students' engagement but also empower them to adopt a more proactive stance in their learning journey.

By incorporating elements of play, students are encouraged to confront psychological barriers and language challenges that they might otherwise shy away from. This is particularly crucial for those preparing for careers in the management of enterprises within the mineral and raw materials sector, where effective communication is essential. The enthusiastic participation of students in classes utilizing game-based approaches highlights their increased interest in the

subject matter. This heightened engagement fosters a motivating learning environment, which is instrumental in alleviating common anxieties associated with communicating in a foreign language. As students become more comfortable with these interactions, they experience a decrease in shyness and stress, allowing them to express themselves more freely.

Moreover, the experiment underscored the necessity of employing a variety of game types in foreign language instruction, especially in technical universities. This diversity not only aids in skill development but also equips students with the competencies required for success in the mining industry.

The analysis of the experimental data reveals that the proposed model, which leverages game techniques, enhances students' comprehension of the material while rendering the learning experience more effective and enjoyable.

In addition to boosting motivation, the implementation of game techniques prepares students for real-world scenarios where foreign language skills are crucial. This is particularly relevant in professional communication settings, where clarity and confidence can significantly impact operational success. The positive changes observed in students,including improvements in memory retention, motivation levels, language proficiency, and understanding of grammatical structures, further reinforce the effectiveness of these methods.

Furthermore, the application of game-based learning strategies aligns with contemporary educational theories that advocate for interactive and student-centered learning environments. By fostering collaboration and competition, games can simulate real-life situations, making the learning process more relatable and applicable. This experiential learning approach not only enhances language acquisition but also cultivates essential soft skills, such as teamwork, problem-solving, and adaptability, which are invaluable in the dynamic field of mineral resource management. In conclusion, the integration of game techniques in teaching foreign languages at technical universities is not merely a pedagogical trend; it is a transformative approach that significantly enriches the educational experience. As future specialists in the mining industry navigate the complexities of global communication, these innovative teaching strategies will undoubtedly play a pivotal role in shaping their professional capabilities and confidence.

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Development of Critical Media Literacy Scale for Primary School Students

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Abstract

As the internet and social media have become increasingly widespread, critical media literacy and the ability to measure this skill from an early age have become increasingly important. In Turkey, no valid and reliable measurement tool suitable for this age group has been found. For this reason, in this study, it was aimed to develop a critical media literacy disposition scale for 3rd and 4th grade primary school students. For this purpose, a literature review was conducted to develop a draft scale, an item pool was created, expert opinion was sought, a pilot application was conducted, EFA was conducted with 344 students, CFA was conducted with 541 students, and internal consistency coefficients of the items in the scale were calculated. With the completion of these stages, the scale consisted of 12 items and two dimensions, 7 of which were critical media reading (CMR) and 5 of which were critical media writing (CMW). As a result, EFA and CFA analyses show that the scale is valid. The reliability value of the CMR dimension of the scale was calculated as 82.5 and the reliability value of the CMW dimension was calculated as 79.4. The reliability coefficient of the total scale was calculated as 87.2. These coefficients show that the scale has a reliable structure.

Keywords: media, media literacy, critical media literacy, primary school.

1. Introduction

It has been found that false information spreads six times faster than true information on social media (Aimeur et al., 2023; Vosoughi et al., 2017). In a study conducted by Vosoughi et al. (Vosoughi et al., 2017), it was discovered that while the first 1 % of fake news reaches between 1,000 and 100,000 people, true news rarely reaches more than 1,000 people. This situation leads to individuals, particularly children, being exposed to false or dangerous content (such as viruses, spam, unwanted pop-up windows, fraud, harassment, bullying, sharing of private life, advertisements, etc.) (Bibizadeh et al., 2023; Fedorov et al., 2022).

On the one hand, the number of false and fake news and information sharing on social media is rapidly increasing, while on the other hand, the number of internet-addicted individuals (especially children and young people) is growing daily. To protect children and young people from the negative effects of the internet and social media,it is essential to shield them from these dangers. However, the way to protect them from the harmful effects of media is not to completelyisolate them from this environment, but to equip them with critical media literacy skills. Additionally, it is necessary to measure and evaluate the training provided, both to receive feedback and to use it in academic studies. For this purpose, measurement tools with proven validity and reliability are required.

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When examining the scales developed for critical media literacy in Turkey, the Digital Literacy Scale for primary school students (Şahin et al., 2022), the Media Literacy Scale for 36-72 month-old children (Kadan, Aral, 2020), the Media Literacy Skills Scale for general media users (Erişti, Erdem, 2017), the Media Literacy Rubric (Çocuk, Uzun, 2018), the Media Literacy Teacher Efficacy Scale (Kaplan, 2017), the Sugary Drinks Media Literacy Scale (Demir, Bektaş, 2021), the Media Literacy Scale Sensitive to Entertainment Purposes for secondary school students (Ulu Aslan, Baş, 2022), and the Digital Literacy Scale for secondary schools (Avinç, Doğan, 2024) have been developed. There are also some scale development studies conducted outside of Turkey (Ashley et al., 2013; Chang et al., 2011; Literat, 2014). However, these scales are generally suitable for middle school and older age groups. Literature review has been conducted, but no critical media literacy disposition scale specifically developed for primary school students has been found.This study is expected to contribute to addressing this gap in the field.

In this framework, the study sought to answer the following sub-problems:

– Do the results of the exploratory and confirmatory factor analyses of the Critical Media Literacy Scale developed for 3rd and 4th grade primary school students meet the validity criteria?

– Does the Critical Media Literacy Scale developed for 3rd and 4th grade primary school students meet the reliability criteria?

2. Materials andmethods

In this study, it was aimed to develop a critical media literacy disposition scale with validity and reliability for 3rd and 4th primary school students. The study was designed in cross-sectional survey model. In the cross-sectional survey model, the researcher tries to collect data from a group for a single time in a certain period of time (Christensen et al., 2015).

Participants

The participants of the scale development process consisted of three groups. The first group consisted of 30 students to whom the draft scale was piloted. The second group consisted of 344 students for whom exploratory factor analysis was conducted. The third group was a group of 541 students for which confirmatory factor analysis was conducted. Information about the participants is given in tables (Tables 1–3).

Table 1. Participants subjected to the pilot study

Variables	*Categories*	*F*	*%*
Gender	Male	14	46,7
	Girl	16	53,3
Class level	3rd grade	15	50
	4th grade	15	50
Total		30	100

Among the students in the pilot study group, 14 (46.7 %) were male and 150 (53.3 %) were female. Fifteen (50 %) of the students were 3rd graders and 15 (50 %) were 4th graders.

Table 2. Participants who underwent EFA

Variables	*Categories*	*F*	*%*
Gender	Male	194	56,4
	Girl	150	43,6
Class level	3rd grade	174	50,6
	4th grade	170	49,4
Total		344	100

Among the students in the study group applied for EFA, 194 (56.4 %) were male and 150 (43.6 %) were female. 174 (50.6 %) of the students were 3rd graders and 170 (49.4 %) were 4th graders.

Table 3. Participants who underwent CFA

Variables	*Categories*	*F*	*%*
Gender	Male	268	49,5
	Girl	273	50,5
Class level	3rd grade	221	40,9
	4th grade	320	59,1
Total		541	100

Among the students in the study group applied for CFA, 268 (49.5 %) were male and 273 (50.5 %) were female. Of the students, 221 (40.9 %) were 3rd graders and 320 (59.1 %) were 4th graders.

Scale Development Process

The development of the critical thinking disposition scale involved the following steps: (a) creation of the item pool, (b) obtaining expert opinions on the items, (c) pilot implementation, (d) data collection and analysis for exploratory factor analysis, (e) data collection and analysis for confirmatory factor analysis, (f) reliability analysis, and (g) reporting.

Creation of the Item Pool

To create the item pool, a comprehensive literature review was first conducted. Relevant sources were examined, and definitions and explanations regarding critical media literacy were explored. Subsequently, an item pool was developed based on the dimensions deemed important by experts on critical media literacy. The items considered for inclusion in the scale, along with their equivalents in the literature, were compiled into a spreadsheet (Arısoy, 2009; Aufderheide, 1993; Ausat, 2023; Bawden, 2001; Bostancı, 2023; Çakmak, Müezzin, 2018; Çiftçi, 2018; Güney, 2017; Horowitz-Kraus, Hutten, 2018; Kargın, Demir, 2023; Kartal, 2007; Korkmaz, Yeşil, 2011; Literat, 2014; Okur-Berberoğlu, 2015; Özdemir, 2021; RTÜK, 2024; Savcı, Aysan, 2017; Smith, 2016; Solmaz, Yılmaz, 2012; Uyar, Asrak Hasdemir, 2023; Treske, 2007; Yıldırım, 2019; Young, 2004). The initial draft item pool comprised 30 items. Efforts were made to ensure that the scale items were designed to measure characteristics of critical media reading and writing, consistent with the study's objectives. The scale utilized a Likert-type format with three response options: (1) never, (2) sometimes, and (3) always, to be more suitable for 3rd and 4th grade primary school students. Keywords were labeled to facilitate item classification.

Receiving Expert Opinion

Following the creation of the draft scale, expert opinions were sought to evaluate the content validity of the scale and its suitability for measuring critical media literacy disposition. The draft item pool was reviewed by two groups of experts. The first group consisted of two experienced teachers with master's degrees in classroom teaching who instruct 3rd and 4th grade students. They assessed whether the items were appropriate for these grade levels and whether the students comprehended the items correctly. The second group included two academicians with doctoral degrees in the field of classroom teaching. Based on the feedback from both groups, 10 items were removed due to concerns related to the appropriateness of the statements for the target age group, item length, comprehensibility, and overall number. Revisions were made to 4 items while maintaining content validity. The revised scale contained 20 items and encompassed two dimensions: media reading (Aufderheide, 1993; Bawden, 2001; Hobbs, 2006; Kartal, 2007; Malik, 2008; RTUK, 2024) and media writing (Aufderheide, 1993; Hobbs, 2006; Malik, 2008; RTUK, 2024; Solmaz, Yılmaz, 2012; Uyar, Asrak, 2023).

Pilot Implementation

The draft scale was initially administered to a sample of 30 students. During this pilot phase, any difficulties that students encountered in understanding the items were noted. Based on these observations, while the number of items remained unchanged, some items were simplified.

Exploratory Factor Analysis

Following the pilot study, the finalized scale was administered to a sample of 344 students for exploratory factor analysis.

Confirmatory Factor Analysis

Subsequent to the exploratory factor analysis, confirmatory factor analysis (CFA) was conducted on the scale. For CFA, the scale was administered to 541 students from various schools.

Inter-Dimensional Correlation and Reliability Analysis

Pearson correlation analysis was performed to assess whether the binary correlations between dimensions posed a multicollinearity issue. Item-total correlation coefficients and Cronbach's alpha internal consistency reliability coefficients were calculated to determine the reliability of the scale items.

3. Discussion

Media Categorization and Impact

Media can be broadly classified into traditional and new media tools. Traditional media tools include television, radio, and newspapers, which have a longer historical presence, while new media tools encompass platforms such as YouTube, Instagram, and Facebook (Yılmaz, 2020). The significance of new media tools, particularly social media, is increasing rapidly. Between 2023 and 2024, 97 million new individuals began using the internet, resulting in a 1.8 % increase in the total number of internet users. As of now, global internet users have reached 5.35 billion, indicating that over 66 % of the global population is online. Moreover, the number of actively used social media accounts exceeds 5 billion, corresponding to 62.3% of the world's population (Datareportal, 2024).

The extensive reach of media presents both benefits and challenges. One notable issue is internet addiction. In the virtual realm, individuals often create idealized personas, seeking increased followers. The brain perceives more likes and shares as rewards, which can lead to addictive behaviors (Burhan, Moradzadeh, 2020; Kargın, Demir, 2023; Westbrook et al., 2021).

Several studies highlight that new media tools can lead to significant problems regarding the mental health of young people. Health issues such as sleep disorders and a sedentary lifestyle are associated with media use (Keleş et al., 2019). Additionally, maintaining multiple social media accounts can contribute to mental health disorders (Rosen et al., 2013). The need to manage time across several platforms and adhere to their specific demands can induce anxiety. Excessive use of social media has also been linked to increased bullying behaviors (Demircioğlu, Akar, 2024). Conversely, social media has facilitated the rise of 'phenomena', individuals with substantial followings recognized through these platforms (De Veirman et al., 2017; Djafarova, Rushworth, 2017). Some phenomena achieve extraordinarily high follower counts (Smith, 2006) and exert considerable influence on children and adolescents, with effects that can be both positive and negative. Notably, idealized and unrealistically perfect personas can negatively impact individuals (Kotsonis, Dunne, 2024).

While research indicates various adverse effects associated with new media, it also suggests that this medium is often not utilized effectively. Despite growing up in the digital era, many students struggle with essential digital skills such as information searching and evaluation (Avinç, Doğan, 2024). This underscores the importance of acquiring media literacy skills, particularly for children and adolescents. Media literacy is increasingly recognized as a critical 21st-century skill (Eyal, Te'eni-Harari, 2023; Snavely, Cooper, 1997).

Media Literacy and Its Relationship with Critical Thinking

Media literacy aims to cultivate an awareness that enables individuals to accurately comprehend media content and critically evaluate it (Martin, Grudziecki, 2006; Walther et al., 2014). In this context, there are significant overlaps between media literacy and critical thinking, with both competencies recognized as essential 21st-century skills (Xie et al., 2019). Critical thinking, historically referred to as wisdom, involves the capacity to make objective, purposeful, logical, applicable, realistic, and goal-oriented judgments free from bias, based on one's knowledge, experience, and research (Ennis, 1993; Li, 2023; Lipman, 2003; Mazer et al., 2007; Paul, Elder, 2001). Media literacy is defined as "the ability to access, analyze, evaluate, and communicate messages in various forms" (Aufderheide, 1993). Another definition of media literacy is "the ability to access various types of media messages (visual, auditory, printed, etc.), to critically analyze and evaluate the accessed media, and to produce one's own media messages" (RTÜK, 2024). As evidenced, both critical thinking and media literacy involve common skills such as thinking, questioning, analyzing, evaluating, and generating new ideas or products. Thus, it is essential to teach media literacy within the framework of critical media literacy.

4. Results

In this part of the study, EFA, CFA, item total correlation coefficients and reliability findings of the critical media literacy disposition scale are presented.

Exploratory Factor Analysis (EFA) Results

First, exploratory factor analysis was conducted to determine whether the measurement tool formed the expected dimensions. The purpose of EFA is to understand and reduce many items in the draft scale to latent constructs that represent the main dimensions of the scale (Field, 2009).

Before the exploratory factor analysis, the KMO (Kaiser Mayer Olkin) coefficient was calculated to test whether the data were suitable for EFA (Tabachnick, Fidell, 2013). Since the KMO coefficient was above .70 (.906), the analysis was deemed appropriate (Büyüköztürk, 2011). One of the analysis types to be considered in EFA is Barlett's Test of Sphericity. The test assumes that the sampling adequacy in the study group is at a certain degree and significance level (Sipahi et al., 2010). The coefficient of Barlett's Test of Sphericity was calculated as [$\chi(344)= 1372.578$; $p=0.00$] and found to be significant (Brace et al., 2003).

After the prerequisites for EFA were fulfilled, the items were rotated with 9999 iterations of the Varimax Rotation technique. 8 items in the draft scale consisting of 20 items were removed from the scale because the item was not suitable for the relevant factor, the item was included in many factors and the factor loading of the item was below 0.45. As such, the scale was reduced to 12 items, 7 of which were critical media reading (CMR) and 5 of which were critical media writing (CMW) (Büyüköztürk, 2011; Sipahi et al., 2010). As a result of EFA, it was concluded that the scale was combined into two factors.

The scree plot showing how many dimensions the scale consists of is given in (Figure 1).

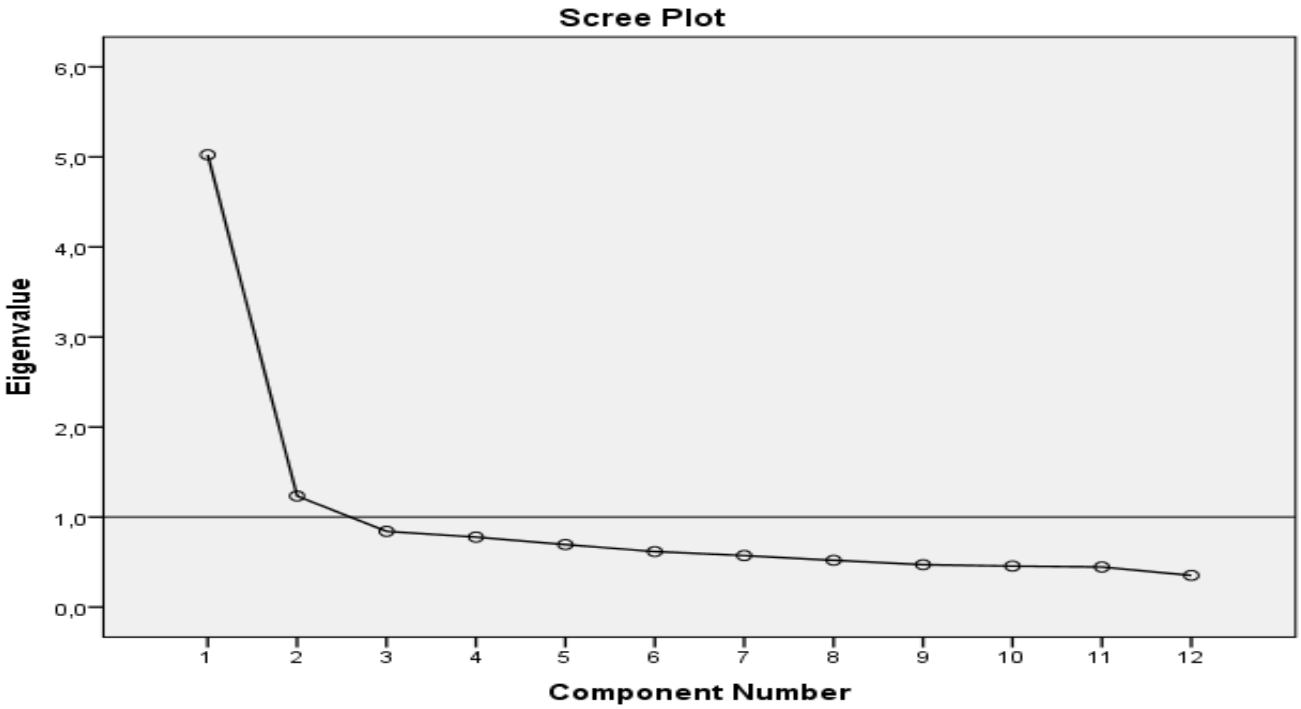

Fig. 1. Scree plot

Scree plot graph shows that the scale has 2 dimensions.

The results of the EFA Varimax Perpendicular Rotation technique analysis are given in Table 4.

Table 4. Factor structure analysed by varimax rotation technique

	1	2
3. When I see or hear information from the media, I research the subject from different sources and try to understand it.	,730	
5. I investigate whether the information in the media is reliable.	,686	
1. I try to learn new and different information from the media	,682	
6. I pay attention to whether the information given in the media	,653	

	1	2
contradicts each other.		
2. I try to understand the information I get from the media correctly.	,633	
7. I wonder whether the person providing information in the media is an expert on that subject or not.	,618	
8. I wonder and question whether the information I see and hear in the media is true or not	,612	
20. When I share something in the media, I am careful not to advertise any person, organization or thing.		,763
16. I take care not to share personal (private) information and images of others in the media without permission		,687
19. I try to be impartial when sharing something in the media.		,683
14. I try not to insult or badmouth anyone in the media.		,678
15. I make sure that the content I share in the media is appropriate for the group I target.		,668
Variance explained: (Total: 52.2)	41.9	10.3
Eigenvalue	5.02	1.23

Exploratory factor analysis was conducted using Varimax vertical rotation technique. Since the factor loading was limited to .45, items below .45 were excluded from the analysis. EFA results show that the scale has two dimensions with eigenvalues greater than 1 and representing 52.2 % of its variance. In addition, the scree plot shows how many factors were included in the scale. The explained variance values for the dimensions are 41.9 % for CMR and 10.3 % for CMW, respectively. The factor loadings of the items vary between .612 and .763.

After the results of the exploratory factor analysis, correlation analysis was performed to determine whether there was a multicollinearity problem between the dimensions. The findings are given in (Table 5).

Table 5. Descriptive statistics and correlations of critical media literacy dispositions

Size		N	Number of items	Min	Max	Mean	Ss	Correlation coefficient between dimensions
a.	Media reading	344	7	7	21	16.5	3.2	,612**
b.	Media writing	344	5	5	15	12.8	2.4	
Total		344	12	12	39	29,3	5.03	

Pairwise correlations between dimensions below .85 indicate that there is no multicollinearity problem (Litch, 1998). The findings show that the correlation coefficients are below this reference value.

Item-Total Correlation and Reliability Findings

After the validity studies of the scale, item-total correlation coefficients and internal consistency reliability were calculated to determine the reliability of the items in the current scale. Statistical information about the data analysis related to reliability is given in (Table 6).

Table 6. Item total correlation coefficients and reliability coefficients

Dimensions	Items	Item-Total Correlation	Reliability Coefficient
Critical Media Reading	s1	,469	82.5
	s2	,528	
	s3	,570	
	s5	,618	
	s6	,585	
	s7	,568	

Dimensions	Items	Item-Total Correlation	Reliability Coefficient
	s8	,586	
Critical Media Writing	s14	,621	79.4
	s15	,665	
	s16	,493	
	s19	,528	
	s20	,485	
Total			87,2

The media literacy scale is reliable since item-total correlations for all dimensions are above .25 and internal consistency coefficients are above .60 (Field, 2009). The reliability coefficient of the entire scale was found to be .87.2.

CFA Analysis Results

In confirmatory factor analysis, some fit indices are used to determine whether the tested model is compatible with the research data. The fit indices give a value regarding whether the tested model is acceptable or not. The research data related to the indices are expected to be between the lower and upper values. Index values between these values indicate that the model is acceptable (Kline, 2011). Apart from $\chi 2$/df reporting, there is no consensus on which of the CFA fit indices should be reported (İlhan, Çetin, 2014). Since the chi-square significance level is affected by the sample size, it is recommended to use chi-square/degree of freedom (Şimşek, 2007). For other indices, McDonald, Ho (McDonald, Ho, 2002) suggested reporting CFI, GFI, NFI and NNFI (TLI) values, Garver, Mentzer 1999 (Garver, Mentzer, 1999) suggested reporting RMSEA, CFI and NNFI (TLI) values, (Brown, 2006) suggested reporting RMSEA, SRMR, CFI and NNFI (TLI) values and Iacobucci, (Iacobucci, 2010) suggested reporting CFI and SRMR values. In this study, chi-square/sd, GFI, AGFI, IFI, CFI and RMSEA indices were analysed. The findings are presented in (Table 7).

Table 7. Comparison of detected measurement values and reference fit index values

	Measurement values	Perfect fit	Acceptance can be adapted	Compliance quality
CMIN	137,518			
Sd	51			
CMIN/sd	2,696	0≤χ2 /df≤2	2≤χ2 /df≤3	Acceptable
P	,000	.05>		Not suitable
GFI	.958	0.95≤GFI≤1.00	0.90≤GFI≤0.95	Perfect
AGFI	,936	0.90≤AGFI≤1.00	0.85≤AGFI≤0.90	Perfect
IFI	, 970	0.95≤IFI≤1.00	0.90≤IFI≤0.95	Perfect
CFI	, 970	0.97≤CFI≤1.00	0.95≤ CFI≤0.97	Perfect
TLI	,920	0.95≤IFI≤1.00	0.90≤IFI≤0.95	Acceptable
RMR	0,33	005 > RMR	.06 ≤ RMR ≤.08	Perfect
RMSEA	,057	0≤RMSEA≤0.05	0.05≤RMSEA≤0.08	Acceptable

Source: Byrne, 2010; Blunch, 2008

The fit index values obtained from CFA were calculated as$\chi 2/df$= 137.518, GFI=.958, AGFI=.936, IFI= .970, TLI= .920, CFI=.970, RMR= 0.33 and RMSEA=.057. It shows that the overall fit index ($\chi 2/df$) of the tested model is within the acceptable fit range. A value below 3 indicates acceptable fit and a value below 2 indicates good fit (Bryne, 2010; Schermelleh-Engel et

al., 2003). According to the fit index value ranges,$\chi 2/df$, TLI and RMSA values have acceptable values, while GFI, AGF, IFI and CFI values have excellent fit values.

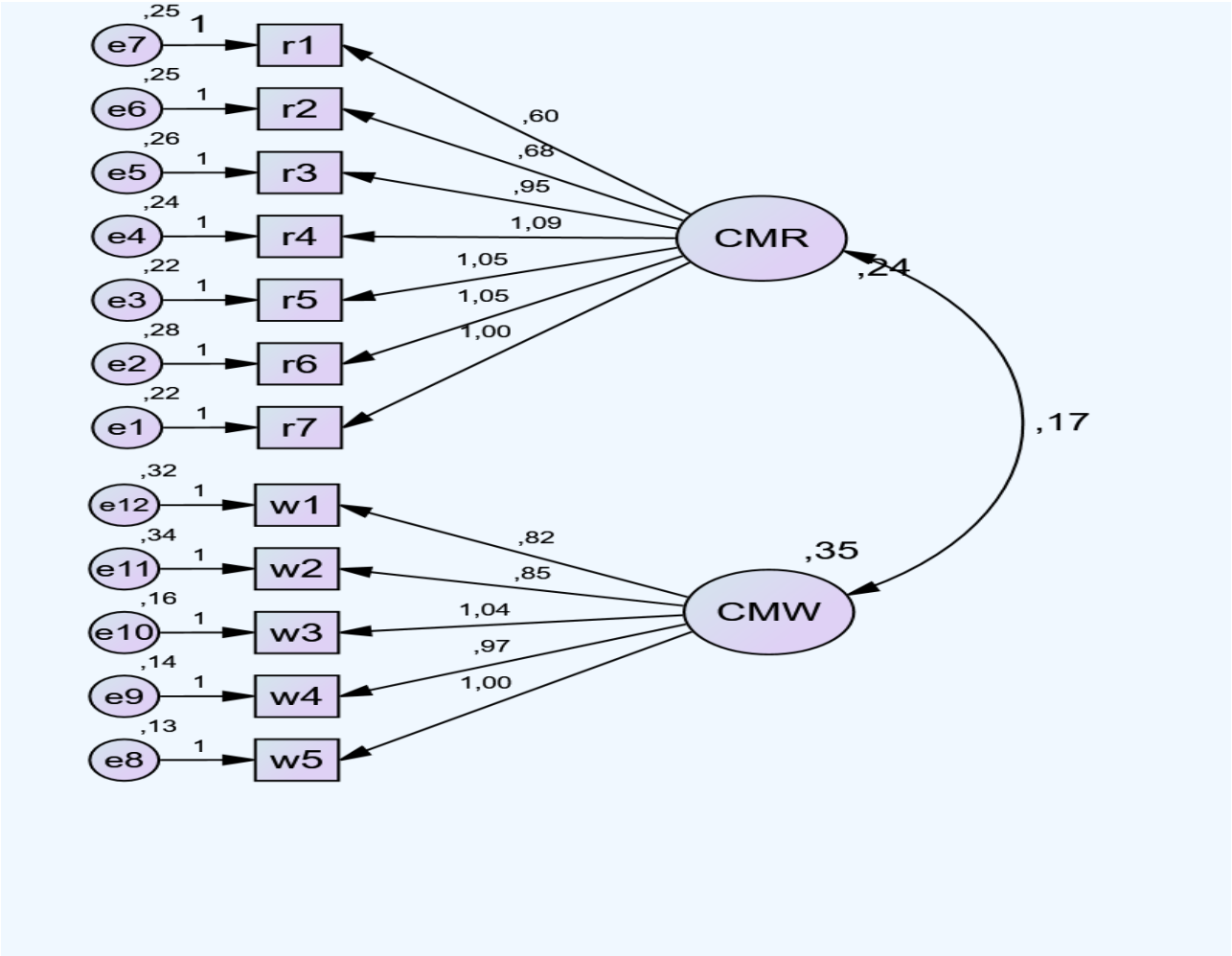

Fig. 2. CFA diagram in measurement model

5. Conclusion

This study aimed to develop a critical media literacy disposition scale for 3rd and 4th grade primary school students. The strength of the study is augmented by presenting multiple arguments to determine the validity and reliability of the scale measurements. To ensure the content validity, a comprehensive literature review on critical media literacy was conducted, leading to the creation of an item pool. Initially comprising 30 items, the draft pool was refined with expert feedback, resulting in a final draft scale of 20 items using a 3-point Likert type format. This draft scale was initially applied to a group of 30 students to observe their responses and to identify any issues with understanding or answering the items. After necessary adjustments, the final scale underwent Exploratory Factor Analysis (EFA) with 344 students to assess its construct validity. EFA results led to the elimination of 8 items, producing a refined scale with 12 items divided into two dimensions. The first dimension, 'Critical Media Literacy' (CMR), which included 7 items, explained 41.9 % of the variance. The second dimension, 'Critical Media Writing' (CMW), comprising 5 items, explained 10.3 % of the variance. The total variance explained by the scale was 52.2 %.

The scale was then subjected to Confirmatory Factor Analysis (CFA) with a separate group of 541 students. CFA results showed acceptable values for $\chi 2/df$, TLI, and RMSA, and excellent fit levels for GFI, AGFI, IFI, CFI, and RMR. These results confirmed the scale's structure. EFA and CFA analyses indicate that the scale is valid (Kline, 2011; Schermelleh-Engel et al., 2003).

To test reliability, Cronbach Alpha coefficients were calculated. The total scale's Cronbach Alpha was 87.2, with the CMR dimension at 82.5 and the CMW dimension at 79.4, indicating a

reliable structure. Item-total correlation coefficients confirmed that binary correlations between dimensions did not result in multicollinearity (Field, 2009; Tabachnick, Fidell, 2013).

In Turkey, no critical media literacy scale suitable for primary school students exists, though some related scales have been identified. For instance, Şahin et al. (Şahin et al., 2022) developed a digital literacy scale for 3rd and 4th grade students, focusing on digital device usage rather than media message interpretation. Ulu Aslan and Baş (Ulu Aslan, Baş, 2022) created a media literacy scale for secondary school students, which resulted in a single sub-dimension after EFA and CFA. Kadan and Aral (Kadan, Aral, 2020) developed a scale for children aged 36-72, while Erişti and Erdem (Erişti, Erdem, 2017) designed a general media literacy scale with 45 items across 4 dimensions. Other scales include the media literacy rubric (Çocuk, Uzun, 2018), media literacy teacher competence scale (Kaplan, 2017), sugary drinks media literacy scale (Demir, Bektaş, 2021), and a digital literacy scale for secondary schools (Avinç, Doğan, 2024). Internationally, similar scales exist (Ashley et al., 2013; Chang et al., 2011; Literat, 2014) but are typically geared towards middle school and older age groups.

The literature review reveals that while there are media literacy scales in Turkey, none are specifically designed for primary school levels with a focus on critical media literacy. Thus, this study presents a novel contribution by addressing this gap with a scale suitable for primary school students and oriented towards critical media literacyBased on the results of the study, the following suggestions can be made:

1. It can be suggested that teachers or academicians can use the obtained scale to determine the critical media literacy levels of students.
2. It can be suggested to use the scale for various scientific studies (descriptive, relational, experimental, etc.).
3. It can be suggested to carry out scale development studies including different sub-dimensions for critical media literacy.
4. It may be suggested to examine the relationship between critical media literacy and different disciplines.
5. It can be suggested that this developed critical media literacy scale should be analysed periodically in order to increase its validity and reliability and should be updated if necessary.
6. Since the scale is easily applicable, it can also be used for 2nd grades of primary school. For this purpose, a validity and reliability study can be conducted to test the suitability of the scale for 2nd grades.

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Transformation of Student Roles and Behavior Patterns in the Context of Digitalization

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Abstract

The predominance of consumption values in the structure of public consciousness, the increased focus of universities on achieving the goals of commercial efficiency, and the opening of new digital opportunities for receiving educational services contributed to changes in the needs and behavioral patterns of students. The purpose of the material is to study the processes of transformation of role positions and expectations of Russian students in the in the context of the dynamic development of digital technologies and the introduction of online education models. Taking into account the need to analyze the subjective opinions of students, the study uses a survey method (N=1107 students of Russian universities). The research materials were supplemented with data from focus groups (N1=10 and N2=9). It has been established that the digitalization of education creates inflated expectations of students regarding the personal characteristics and media competence of the teacher. 63.1 % associate their interest in learning with the teacher's competence, such as the ability to present material in an interesting way and introduce entertaining content into the course. Modern youth, who are characterized by integration into the media environment, dictate a special demand for the teacher's ability to present material in an interesting way, including using media technologies. The demand for a charismatic teacher is even more clearly expressed (78.1 %). These expectations are more typical of students who like to study online. It is concluded that the modern student transfers responsibility for the results of his studies and motivation to acquire knowledge to the teacher. The focus group materials allowed us to conclude that the development of digital technologies is reducing the importance of the teacher's functionality related to the transfer of knowledge. In the context of the dynamic development of digital services, competition for teachers comes from chatbots based on GPT technology. Strengthening consumer expectations is reflected in the formation of a request for loyalty on the part of the teacher, the opportunity to freely choose the quantity and quality of educational services. It was found that a significant portion of students considered it possible to independently determine the rules of online learning (72.3% – do not consider it necessary to always take notes on lectures; 53.7 % – use additional materials when taking a test/exam; 33.3 % – negatively perceive the practice of turning on the camera during classes). As a consumer of educational services, the student expresses a desire to have access to educational content to view it at a convenient time, the opportunity to revise it or stop at those aspects that raise questions or difficulties.

Keywords: digitalization, media environment, media competence, consumption of educational services, behavioral models of students, online learning, higher school teacher.

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1. Introduction

The active introduction of digital services and technologies into the educational space of higher education has had a significant impact not only on the digital infrastructure of the educational process and the content of teaching practices, but also on the conceptual transformation of the roles of student and teacher (Sarkio et al., 2023). The emergence of new educational opportunities and trajectories due to the active development of the media environment and changes in the digital landscape of higher education (availability of electronic content, demand for interactive technologies, etc.) has brought changes to the traditional expectations/demands of students. The transformation of higher education from a privilege and public good into an educational service and commercial product is due to the need to ensure the profitability of educational programs. The studentexperiences these changes, transforming his role to new digital and economic realities.

Scientific discourse is also changing. The focus of modern researchers is not so much on the quality of education as on the needs of students, their emotional and psychological well-being. In particular, A. Jakoet-Salie and K. Ramalobe talk about the need to change teaching practices in terms of increasing attention to the personal characteristics of each student (Jakoet-Salie, Ramalobe, 2023). The search for tools to increase student satisfaction is becoming one of the most urgent tasks facing university leaders today (Armas-Rodriguez, Barroso-Osuna, 2020). A number of scholars have raised concerns about the negative impact of digitalization on student well-being (Otterborn et al., 2023). Even the system of assessing and monitoring knowledge, according to scientists, should become more attractive to students and provide new types of feedback (Bayne, Gallagher, 2021).

Digitalization of education, despite its obvious advantages, has significant limitations in terms of socialization of youth (Gálik et al., 2024; Gálik,Gáliková Tolnaiová, 2022). The increasing share of digital technologies and online services during training leads to the displacement of traditional pedagogical communications between teacher and student (Frolova et al., 2023). However, according to a number of scientists, digital services cannot, unlike a teacher, form a student's intellectual virtues (Shanley et al., 2020). In addition, the excessive introduction of digital technologies creates risks of violating the ethical behavior of students (Schreiber, 2014).

As already noted, a student as a consumer of educational services cannot always adequately assess their quality, but his request for satisfaction from the educational process often becomes key. Thus, a student in modern conditions, as Russian studies emphasize, is primarily focused on interesting tasks with a low level of complexity (Puchkova et al., 2021). These dysfunctions can contribute to a decrease in the quality of professional training and increased risks of conflicts in the educational environment. In addition, the digital optimism of students increases the relevance of this problem and creates an extremely high bar for assessing, first of all, the interactivity of education. Let us note that centering education in the area of providing "interesting learning" contradicts the fundamental principles of university training.

Digitalization as a general trend creates a demand and increases the importance of developing qualities in a student that would meet the conditions of the ultra-complex digital era (Jandrić et al., 2018). In particular, Russian scientists note the need to develop competencies such as critical analysis of information, adequate use of digital devices and the functionality of social networks, carrying out financial and trading transactions in the virtual space, and developing digital content (Savka et al., 2022).

The large-scale use of information and communication technologies transforms the exchange of information and knowledge (Vuori et al., 2019), which sets new contours for the consumption of educational services and affects the professional and educational identity of the student (Wallin et al., 2022). We believe that a student's self-identification as a consumer of educational services is associated with his acquisition of new characteristic features. There is a transition from the need for traditional acquisition of academic knowledge to the formation of a request for the entertaining nature of learning, extracurricular communication practices, and the use of shock accents in the teacher's presentation of the material. The student's needs are illustrated in the request to expand the emotional component of the educational process by receiving reactions of surprise, admiration, and interest. These conclusions were partially confirmed in foreign studies. In particular, there is a demand for creating an atmosphere of fun in the educational space (Ideland, 2021); psychological comfort (Cena et al., 2023), increased enjoyment and a positive learning climate (David, Weinstein, 2023). However, a number of researchers have noted a decrease in students' interest in reading

books, the widespread use of practices of combining study sessions with viewing social networks, correspondence with friends and games (Singh, 2021; Frolova et al., 2023). Thus, it can be assumed that, without receiving impressions during the educational process, the student replaces them with emotions from his hobbies. The conclusion of foreign scientists about the formation of a new model of student behavior in the context of digitalization –cyberloafing (Arslantas et al., 2023; Demirtepe-Saygılı, Metin-Orta, 2021) is significant.

Digitalization of education is designed to provide the necessary conditions for the convenience of the educational process (choice of time, place, means of communication, etc.). At the same time, informal dialogue, which was previously not possible in an academic environment, is becoming today a key principle of education (Aldhafeeri, Alotaibi, 2023). In foreign scientific literature, the concept of a "smart educational institution" is actively discussed, which would include new technologies for assessing knowledge, measuring and monitoring the behavior of all subjects of the educational process (De Freitas et al., 2020). This concept can be a response to students' request not to expose themselves to risks caused by the subjectivity of knowledge assessment on the part of the teacher. As N. Selwyn notes, students feel vulnerable when they are assessed by a teacher (Selwyn et al., 2023).

Discussing such student needs would have been impossible just a decade ago. However, today, when a student acts as a consumer of educational services, choosing educational institutions, this scientific discourse becomes very timely. At the same time, digitalization creates new contours for the development of education related to meeting the psychological needs of the student. A number of researchers analyze the capabilities of digital technologies in reducing the subjectivity of knowledge assessment. On the other hand, the discussion about the acceptability of preserving traditional aspects of education in online learning conditions is becoming very relevant. In particular, the requirement to turn on the camera corresponds to the principle of inclusion, full-time presence. However, students in this case talk about violation of personal boundaries, psychological discomfort, and "total surveillance" (Williamson, 2020).

The inversion of the democratic principles of organizing the educational space creates the preconditions for the dominance of negative trends. These include violations of the ethical foundations of the educational process and the academic integrity of students. A number of scientists say that the transition to online learning makes it difficult to assess students' knowledge due to the increased incidence of cheating in the session (Balderas, Caballero-Hernández, 2020). The consequence of these destructions is the tightening of exam requirements (Lancaster, Cotarlan, 2021).

It can be assumed that the presence of these trends determines the presence of a conceptual ethical conflict. The student considers himself to have the right, having concluded a "contract" for an educational service, to dictate the conditions for receiving it. Including maintaining privacy in online learning, using additional sources when taking the exam. In essence, grounds are being created for denying among students the right of a teacher to evaluate knowledge for the consumer's money.

The purpose of the article is to study the processes of transformation of the role expectations of Russian students in the conditions of digitalization and the dynamic introduction of media technologies into the educational process.

2. Materials and methods

The following tasks were set during the study:

– Identification of new needs of students in the context of digitalization, including analysis of changes in student behavioral models;

– Assessing the risks of violating the ethical principles of academic integrity in the context of digitalization.

Research hypotheses:

1. The digitalization of education creates high expectations of students regarding the personal characteristics and media competence of the teacher. The hypothesis and consequence is the assumption that the modern student transfers responsibility for the results of his studies and motivation for acquiring knowledge to the teacher.

2. In the context of digitalization of education, there has been a change in the role models of student behavior. Strengthening consumer expectations is reflected in the formation of a request for

loyalty from the university, the introduction of entertainment content into the process of acquiring knowledge, and the ability to freely choose the quantity and quality of educational services.

In preparing the research materials, the authors used a complex of general scientific methods, including analysis, generalization, and systematization. The key method of collecting information was a questionnaire survey due to the possibility of mass coverage of respondents, as well as quantitative assessment of the ongoing transformations. The research design involves selecting respondents based on the snowball principle. The sign of representation was: the presence of the current status of a student at a Russian university. Other signs of representation were not taken into account when constructing the sample due to the difficulty of maintaining established proportions. Thus, the sample is represented by students from universities with a humanitarian orientation, all courses of study (1-5 years), such levels of training as: bachelor's, master's, and specialty. The total sample size is 1107 respondents.

The study results were processed using specialized software. Chi-square test was used for statistical analysis of data.In order to clarify the data obtained and obtain a qualitative assessment of the transformations of the student's role as a consumer of educational services, two focus groups were conducted (N_1 = 10 and N_2 = 9). Sign of representation – online learning experience, undergraduate level, senior courses. The sample was targeted; respondents were recruited via direct mailing.

3. Discussion

During the study, the first hypothesis was confirmed. In particular, the authors established that students have high expectations for the teacher's personal competencies: his charisma and ability to entertain during the educational process. These conclusions were partially confirmed by studies by foreign experts. In particular, the thesis is put forward about the changing needs of students, shifting the focus of preferences from accumulating knowledge to providing a creative atmosphere and fun in the classroom (Ideland, 2021). Moreover, a number of studies emphasize that it is boredom in class that reduces a student's level of motivation and creates his reluctance to continue studying. These factors become more significant in the context of online learning, the need to watch videos for a long time, and perform routine tasks (Cena et al., 2023).

This circumstance, as well as the results of the author's research, indicate the formation of a new role of the student as a consumer of educational services. The quality of this service is determined not so much by the set of knowledge as by the context of its receipt (for example, "easy", "fun", "convenient"). If previously a student came to a university as if it were a "temple of science", now higher education is viewed as a public space where necessary connections are made and interesting communication is ensured. Thus, the second hypothesis of the study was confirmed. At the same time, a number of aspects are debatable: do such changes represent a natural evolutionary process or a dysfunction of the consumer culture of modern society? In our opinion, these processes are dysfunctional, since the dominance of the entertaining format of education harms the formation of the necessary knowledge and skills of students. The conclusion about the loss of fundamentality of higher education is reflected in the works of Russian scientists (Apresyan, 2021; Brutova et al., 2022).

In this regard, a promising direction of research may be the study of the transformation of the qualitative characteristics of the teaching staff of universities. Changing student demands leaves its mark on the personnel policy of higher institutions, reducing the demand for a teacher's academic knowledge and increasing the importance of his personal traits.

The transformation of the role of a student who sees himself as a "consumer of educational services" largely determines his request for independent establishment of rules and norms for conducting classes. Thus, a completely justified requirement to turn on the camera during online classes causes a negative reaction in every third student. The data obtained suggest that online learning may lose the academic nature and fundamental nature of the educational process, transforming into a "background mode." The lecture is often perceived by the student as an "entertaining podcast", which does not require his active role. The results obtained are confirmed by foreign studies, which note increasing cases of cyberloafing of students in the educational process. However, these negative practices, according to scientists, are not associated with the student's transition to a new role as a consumer of educational services, but with a low level of digital literacy (Arslantas et al., 2023).

The study found that a significant proportion of students have encountered cases of violation of academic integrity. The results obtained are confirmed by other studies in which the problem of violation of academic ethics in universities is considered as a key threat to the devaluation of education and the decline in the prestige of higher educational institutions (Janke, 2021). Empirical data obtained from a survey of Chinese students showed that incidents of dishonest behavior are largely associated with the presence of strong justifications for dishonest behavior in the mind of the respondent. A relationship has been established between justification for cheating and intention to cheat (Juan, 2022).

Another destruction is a phenomenon that is associated with an insufficiently high proportion of students who are ready to take notes on educational materials during a lecture. The authors suggest that this approach on the part of students is dysfunctional, as it reduces the cognitive and analytical skills of students: the ability to work with text, to synthesize various aspects of the topic (Frolova, Rogach, 2022). At the same time, correlation analysis showed that there is no relationship between this parameter (willingness to take notes) and students' preference for online learning. However, this conclusion requires a more in-depth study of the relationship of a number of parameters that were not used in this study. It can be assumed that the refusal to take notes is an attribute of the new era of universal access to information. The consequences of these practices should be the subject of further research by Russian and foreign scientists.

4. Results

Empirical data indicate a change in students' value attitudes in terms of education and interaction with the teacher. The student sees his role in "consuming" interesting educational content, receiving services, the quality and composition of which he will determine independently. Thus, 63.1 % associate their interest in learning with such a teacher's competence as the ability to "teach and entertain". At the same time, among students who like to study remotely, the share of those who chose this answer option is slightly higher (66.4 %, which is 3.3 percentage points higher than the average for the sample). It is concluded that the student transfers responsibility for the results of his studies and motivation to acquire knowledge to the teacher.

The demand for a charismatic teacher is even more clearly expressed (78.1 %). These high expectations are more common among students who like to study online. The results of the correlation analysis showed the relationship between the choice of form of training (remote format) and interest in learning (according to the parameter "charisma of the teacher").

Table 1. The relationship between satisfaction with studying online and interest in learning in connection with the charisma of the teacher, pers

Do you like studying remotely online?	*Statement: "Interest in studying online depends on the charisma of the teacher".*			*Total*
	yes	no	difficulttoanswer	
yes	494	95	13	602
no	166	58	2	226
difficulttoanswer	212	62	5	279
Total	872	215	29	1107
*at the significance level p = 0.05 the critical value of χ2 is 9.488				

Thus, the results of the analysis of an arbitrary contingency table using showed the presence of a statistically significant relationship (Table 1).

The materials that were obtained during the focus group allowed us to conclude: modern students rate teachers who maintain informal communication with them significantly higher. The media environment creates new trends in the communication system, including simplification and dominance of the informal context.

Ivan P., 3rd year: "A teacher should not put himself above the student, he should communicate with us as equals. And in general, it's better to be addressed by name than so formally".

Ekaterina A., 3rd year: "It's difficult to communicate with a teacher who does not use social networks and instant messengers for communication. Make promotion courses for teachers, today you need to work with media activity".

It is fair to note that not all students are so radically inclined to transform the practice of interaction with the teacher. However, the request to increase loyalty and reduce formalization in communication with the teacher is becoming the dominant trend.

Anna V., 4th year: "The teacher must understand that we work, we have our own interests and in general we will send here to receive a service, let them provide it, and not require us to perform unnecessary tasks. I mean that there are tasks that will not teach us anything and will not be useful in life, and there is also an additional burden that I did not buy by paying for education."

Ekaterina D., 1st year: "The teacher must be charismatic, interesting with a sense of humor. In general, I believe that when selecting for a position, teachers should be assessed on these competencies and, if necessary, sent to personal growth training".

During online learning, compliance with the attributes of the traditional class format has become important: "seeing the interlocutor's face", turning on the microphone, working in groups. However, a significant portion of students considered it possible to independently determine the rules for studying remotely. Thus, the answer to the question about students' attitude to the requirement to turn on a camera in class showed that every third respondent had a negative attitude towards this practice (33.3 %).

Table 2. Relationship between satisfaction with studying online and students' attitude towards the teacher's requirement to turn on the camera during classes, pers

Do you like studying remotely online?	How do you feel about the teacher's demands to turn on the camera during class?			
	Positive, I like it, it creates a feeling of live communication	Neutral, that's normal, it's no problem for me	Negative, it is not always possible to turn on the camera	other
yes	156	265	177	4
no	47	83	94	2
difficulttoanswer	34	132	109	4
* at the significance level p = 0.01the critical value of χ2 is 16.812				

The results of the analysis of an arbitrary contingency table using showed the presence of a statistically significant relationship (Table 2).

Empirical results indicate a relationship between perceptions of online learning and positive/negative attitudes towards the requirement to turn on the camera. Among respondents who have a negative perception of online learning, there is a higher proportion of those who would prefer not to turn on the camera (above the average by 8.3 percentage points).

During the focus groups, students' opinions on this issue were divided. On the one hand, comments were made such as: "*demands to turn on the camera violate my personal boundaries*", "*by paying for an educational service, I am not obliged to demonstrate my personal space*".

On the other hand, opinions were expressed that characterized the neutral attitude of students to the requirement to turn on the camera in class: "*what difference does it make, I can turn it on*", "*I want to see faces, not a dark screen*". Note that, while generally recognizing the fairness of the requirement to turn on the camera as confirmation of their activity in class, students still prefer not to do this.

Note that in the online format, only every fourth student (27.7 %) always takes lecture notes. 8.7% never do this. The remaining respondents were divided between the "often" and "rarely" answer options. Online learning deepens the distance between participants in the educational process and reduces the student's involvement in the topic of classes. As a consumer of educational services, the student expresses a desire to have access to educational content to view it at a convenient time, the opportunity to revise it or stop at those aspects that raise questions or difficulties.

As a consumer of educational services, the student expresses a desire to have access to educational content to view it at a convenient time, and the ability to replay those aspects that raise questions or difficulties.

Table 3. Relationship between satisfaction with studying online and students' willingness to take lecture notes, pers

Do you like studying remotely online?	Do you take notes during online lectures?			
	yes, always	often	rarely	never
yes	175	220	149	58
no	64	78	67	17
difficulttoanswer	68	109	81	21
** at the significance level p = 0.01 the critical value of χ2 is 20.09*				

The results of the analysis of an arbitrary contingency table using showed the presence of a statistically significant relationship (Table 3).

However, correlation analysis did not show the presence of a statistically significant relationship between these parameters. The relationship between factor and performance characteristics is not statistically significant (the critical value of χ2 at a significance level of $p < 0.05$ is 12.592; significance level $p > 0.05$). In connection with this circumstance, it can be assumed that a student's refusal to take lecture notes is not so much a consequence of the digitalization of education, but rather a consequence of the dynamic development of information and communication technologies and maximum availability of information.

The focus group materials allowed us to conclude that the development of digital technologies is reducing the importance of the teacher's functionality related to the transfer of knowledge, presenting cases on the topic of the training course, selecting interesting sources, etc. Among students, opinions were expressed: "*chatbots with GPT technology will give all information is simple and structured*", "*working with a neural network is more interesting than working with a teacher, stupidly recording a stream of incomprehensible speech*".

The following data is of interest. Among students who do not like studying online, there is a higher proportion of those who state the frequency of cases of dishonest behavior during the session (34.5 %, which is 7.2 percentage points higher than the sample average).

Table 4. The relationship between satisfaction with studying online and the presence of cases of dishonest behavior of students during online sessions, pers

Do you like studying remotely online?	What do you think was the behavior of students during the online session? Have there been cases of dishonest behavior by students (using additional materials when taking a test/exam)?				
	often	rarely	never	Difficulttoanswer	other
yes	148	181	100	165	8
no	78	57	35	55	1
Difficult to answer	76	54	47	97	5
** at the significance level p = 0.01 the critical value of χ2 is 20.09*					

The relationship between factor and resultant signs is statistically significant (Table 4). These results require clarification due to the possibility of the subjective characteristics of the respondent influencing the answers received. Negative attitudes towards online learning can trigger a distorted view of the size of the problem. However, it is fair to note that the problem of unethical behavior (using additional materials when taking a test/exam) is widespread. The presence of such cases is noted by more than half of the respondents: "often" – 27.3 % and "rarely" – 26.4 %.

According to the results of focus groups, modern students often justify their dishonest behavior by external factors: "*everyone does it*", "*I won't need it in the future anyway*".

5. Conclusion

The dominance of consumer trends in modern society has left its mark on the field of higher education. This is due to giving education the status of a paid service, as well as new opportunities

provided by digitalization and the development of the media space. Also, the digitalization of education has provided new opportunities for consuming educational content. Online learning, which was accelerated during the pandemic and did not have a long-term methodological and organizational transition, created an illusion for students about the simplicity of distance education.

The change in the training format has increased the consumer demands of students. At the same time, the return of students to classrooms after the pandemic for many of them was marked by a reluctance to change the convenience of the remote learning format to the traditional format of obtaining higher education. Perhaps this became a predicate for increasing demands on the teacher, his personal and professional qualities. The results of the study confirmed the first hypothesis. It has been proven that in online learning conditions, students have inflated expectations regarding the personal characteristics of the teacher. Students expect loyalty, informal communication, and charisma from the teacher. Of interest is the fact that in the context of digitalization, the teacher's competition comes from chatbots based on GPT technology. The study also confirmed the second hypothesis about the change in role models of student behavior. The possibility of turning to artificial intelligence and media space reduces the student's willingness to take notes (notes), listen carefully, and carry out academic communication with the teacher. The assumption is confirmed that the modern student transfers responsibility for the results of his studies and motivation for acquiring knowledge to the teacher. Thus, in the conditions of digitalization and the dynamic development of the media environment, there is a transformation of student role models of behavior. There is a strengthening of the student's consumer position as a recipient of paid educational services and the formation of requirements for the media competence of the teacher.

Limitations

A limitation of this study is its reliance on empirical results obtained from a single measurement of student opinions. The findings cannot be extrapolated to the entire higher education system. In addition, the limitations of the study are related to the specifics of developing survey instruments, the difficulty of interpreting and analyzing the student's subjective perception of the transformation of his role, and assessing his own behavior patterns.

Declaration of Competing Interest

The manuscript's authors declare that there is no interest in conflict, and all reference materials were dully acknowledged.

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Information Literacy Assessment

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Abstract

The objective of this review is to present and evaluate the literature on the methods and practices of information literacy (IL) assessment in the academic environment. The research concentrates on the two categories of IL assessment: objective or test-based assessment and perception-based assessment. The rationale and objectives of IL assessment are examined. The paper also addresses a number of main IL standards and frameworks. There is a discussion of numerous IL assessment tools and instruments that are enumerated in a variety of literature. The reliability and validity of these measurements, which are discussed in the literature, will also be determined. This article annotates 45 English-language periodical and peer-reviewed articles, reports, and IL standards and framework which highlight information literacy and information literacy assessment. The periodical and peer-reviewed articles were selected from ERIC, ProQuest Education Collection, EBSCO's Academic Search Ultimate and EBSCO Education Source. Each IL assessment tool and instrument has its advantages. To design the most suitable type of IL assessment tool, it is highly depended on the institutional IL objectives and the ability to balance between the objectives and the resources capability of the institution. The best IL instrument must indicate its reliability and validity of the instrument. Information in this article is primary of use and reference of academic librarians, educators and researchers. Literature discussed in this article may also be used as reference for future practice and research.

Keywords: information literacy, information literacy assessment, information literacy standards and framework, test-based assessment, perception-based assessment.

1. Introduction

Information literacy has been long discussed in workplace, academic and higher education sectors since 1970's. The term information literacy was originally used by Paul G. Zurkowski in 1974. He defines information literate person as someone who has mastered the use of a variety of information sources to address issues in their daily lives and at work (Zurkowski, 1974). In educational context, the concept of information literacy was raised by Lee Burchinal at the Texas A&M University library's symposium. He argues that information literacy is beyond conventional literacy, which only emphasize on the ability of reading and writing. Burchinal linked information literacy with the proficiency in the acquisition and utilization of pertinent information for the purpose of problem-solving and decision-making (Burchinal, 1976).

There are multiple definitions of information literacy can be found in literature. The most generally accepted definition of information literacy is by American Library Association (ALA) which defines information literacy as an integrated ability to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (ALA, 1989, para. 3).

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2. Materials and methods

Objectives

The main objective of this review is to identify methods and measurement tools used in assessing information literacy (IL) competencies and skills among students in academic world. Two approaches of assessments identified in this review are objective-based assessment and perception-based assessment. Two preliminary notions and concepts were derived from this purpose for the literature searches are 'information literacy' and 'measurement'/'assessment'. As a result, the words and phrases 'assessment' or 'measurement' or 'evaluation' and 'information literacy' or 'information skills' were employed together in selected four of major databases in education, namely Education Resources Information Center ERIC, ProQuest Education Collection, EBSCO's Academic Search Ultimate and EBSCO Education Source (Appendix 1). Searches were mostly to peer-reviewed literature as a fundamental criterion for assessing quality. However, some conference papers and reports were also used as references. Relevant subject headings were employed in a formal manner, and searches were not restricted by a certain time frame.

Summary of result

The initial results of the searches are shown in Table 1. After a thorough reading from the four (4) stated databases, a total, 79 articles were identified for further investigation. The following are the categories along with the number of relevant articles identified as belonging to the category (Table 2). In addition to the peer-reviewed articles as mentioned above, several standards, guidelines and frameworks from recognized and authorized bodies in information literacy such as *Association of College and Research Libraries* (ACRL), *Society of College, National and University Libraries* (SCONUL), and *Australian and New Zealand Institute for Information Literacy* (ANZIIL) are used as reference and citation in this review. Several reports on the development of information literacy assessment are also included in this review.

Table 1. Initial result of the search

Database	Number of Results
ERIC	513
ProQuest Education	210
EBSCO Academic Search Ultimate	14
EBSCO Education Source	11

Table 2. Number of articles by categories

Category	Number of articles
Test-based assessment	45
Perception-based assessment	21
Combination of self-assessment and test-assessment	13

3. Discussion

Objectives of information literacy assessment

To determine the effectiveness of an educational programme, assessment is usually the best way. The objective of assessment is "to measure institutional effectiveness and the quality of education" (Beile, 2008: 2). In IL context, an assessment's main objective is to measure the proficiency of IL among the students. Some examples of how IL assessments can be used, such as to determine the effectiveness of IL instruction program, to align instructions more closely with the IL learning objective, to evaluate the effectiveness of changes in instructional programmes and to improve the assessment process itself (Walters et al., 2020). Another reason for the development of IL assessment is to gain data about the information behaviour of student, as well as to have a greater understanding of student strengths and weaknesses (Oakleaf, 2009). Assessment of information literacy contributes to curriculum development, measures and tracks student progress, and encourages reflection on the teaching-learning process (Singh, Joshi, 2013).

Information Literacy Standards and Framework

Many tests and questionnaire are used as instruments in assessing IL competencies and knowledge. Most of them follow the recommendations and topics presented in various IL standards, models and guidelines (Al-Qallaf, 2019; O'Connor et al., 2002; Podgornik et al.,

2016). Each of these standards and guidelines has its own learning outcomes and goals (Hicks, Lloyd, 2023). Among the standards and guidelines referred when establishing IL assessment instruments is the *Information Literacy Competency Standards for Higher Education* (ACRL, 2000). This standard comprising of five standards, 22 performance indicators and a range of specific outcomes. This *ACRL Standards*, however, has been completely revised in line with the changing landscape in the area of information, data, media and technology (ACRL, 2015).

It has been rescinded and the new *Framework for Information Literacy for Higher Education* has been introduced in 2016. Although the Standards is no longer serve as the official guiding guideline for the library profession's information literacy efforts, the specific skills that the Standards cover are still relevant in both the Framework and IL assessment (Graves et al., 2021). The framework comprising of six frames and each frames consists of a concept central to IL, a set of knowledge practices, and a set of dispositions (ACRL,2015). Unlike the *ACRL Standards*, the Framework is developed based on a collection of related fundamental ideas and core concept which offering a range of execution possibilities rather than a set of standards or learning outcome that must be achieved.

Besides information literacy standards and guidelines for higher education, there are a few other standards developed by the ACRL. The standards are subject-based standards and one of them is *Information Literacy Standards for Science and Engineering/Technology*(ALA, 2000; Singh, Joshi, 2013). Based on the *ACRL Standards*, the standard consists of five standards and 25 performance indicators. Each performance indicator is complemented by one or more outcomes with objective of evaluating the advancement of scientific, engineering, and technology students at all levels of higher education toward information literacy. The *Information Literacy Standards for Anthropology and Sociology Students, Psychology Information Literacy Standards and Information Literacy Competency Standards for Nursing*developed in 2008, 2010 and 2013 respectivelyare other standards developed by ACRL on subject-based standards (ALA, 2006).

Another standard which is being used as a guideline in establishing IL assessment is the *SCONUL Seven Pillars of Information Literacy* by the Society of College, National and University Libraries (SCONUL). The standard referred as the Seven Pillars of Information Literacy. The United Kingdom (UK) and Ireland-based professional association for academic and research libraries developed the standard in 2011 (Society of College, National and University Libraries, 2011). The standard consists of seven pillars and these pillars, along with a number of awareness statements (understands) and performance challenges (is able to), serve as the foundation for IL practices in higher education in UK and Ireland. In New Zealand and Australia, the *Australian and New Zealand Institute for Information Literacy* (ANZIIL) developed *the Australian and New Zealand information literacy framework*. The Framework is based on an earlier version produced by the *Council of Australian University Librarians* and the *ACRL Standards*(Bundy et al., 2004). Six core standards and four guiding principles make up the ANZIIL framework, which is used to identify specific learning objectives.

Information Literacy Test-based Assessment

A lot of efforts have been implemented and practiced in assessing IL objectively through test assessment approach. One of the methods is by *fixed-choice* tests such as multiple-choice, matching, and true-false tests (Mery et al., 2011). According to Walsh, based on his review of nine type of assessment tools, multiple choice questionnaire is by far the most popular method in assessing students' competencies in IL (Walsh, 2009). Many studies list the advantages of multiple-choice questionnaire. This type of test is "easy to administer while also maximising scoring objectivity" (Rosman, 2015:2). They also agreed that the main advantage of such test over self-assessment is the ability to prevent overestimation through deliberate over-reporting of abilities. Multiple-choice question is a clear time-saver for the teacher and instructor for easy grading, especially in very big classroom or number of students (Laprise, 2012). He also added for teachers or instructors, writing this type of question takes the least amount of time. Walsh highlights that most multiple-choice questionnaire, however, make minimal effort to check the reliability or validity of their test instruments in assessing information literacy skills (Walsh, 2009). This is due to that many of short multiple-choice test are designed primary to check knowledge and skills gained specifically in library instruction sessions. Furthermore, there always be a problem in assessing reliability of short multiple-choice test.

Multiple choice questionnaire, however, have several limitations. One of the limitations is this type of test unable to evaluate deeply and thoroughly the understanding and knowledge in IL.

This type of IL test-based assessments is not appropriate for addressing higher order abilities since they only capture declarative knowledge (Scharf et al., 2007). However, Xu et al. argue that well-written tests are effective, versatile, and can measure and evaluate both higher-order and lower-order thinking abilities (Xu et al., 2016). Another drawback of multiple-choice questionnaire is the absence of flexibility (Goebel et al., 2013). This type of assessment question is rather difficult to be accustomed with institutional context and need. Multiple-choice questions also may unable to evaluate students' IL competencies comprehensively in all components of IL. Dunn noted that "Such test ... cannot assess the effectiveness of student search skills in real life situations" (Dunn, 2002: 28). Proficiency in doing searches or search skills is regarded as one of the key competencies in information literacy.

Four multiple choice assessments tools which are developed based on the ACRL Standard of IL identified in this review are *Project Standardized Assessment of Information Literacy Skills* (Project SAILS; Mery et al., 2011), *Madison Assessment's Information Literacy Test* (Latham, Gross, 2011; Podgornik et al., 2016), and the *Research Readiness Self-Assessment* (RRSA) (Ivanitskaya et al., 2004). RRSA, however, added true/false questions in its question format.

Project SAILS, a federally funded project and initiated by *the Kent State University*, is developed to create an information literacy assessment tool that is both proven its validity and reliability, easy to administer, standardized, and approved for use at any institution. *Project SAILS* has developed a test bank of approximately 150 general information literacy test items and had 77 institutions participating in assessment of their information literacy instruction programs (Beile, 2005). Despite the fact that Project SAILS is constructed using the five *ACRL standards*, the fourth standard is not used since some of its components are insufficient for multiple-choice questions or are covered by outcomes and objectives from other standard (Lau et al., 2016).

The purpose of the *Project SAILS* test items is to assess information literacy competencies of undergraduates and these competencies are general in nature, meaning they are not discipline-specific. Items in the test bank are also used as a foundation and reference to develop other discipline-specific IL assessment instruments. One of the instruments is referred as *Information Literacy Assessment Scale for Education* (ILAS-ED). It was developed to measure teacher candidates' information literacy skills levels (Beile, 2005). It has a combination of 22 multiple choice test items, 13 demographic and self-percept items. In addition to *ACRL Standards*, the *ILAS-ED* items were developed based on the alignment of the *National Educational Technology Standards for Teachers* (NETS-T Standards) (Beile, 2007). Other institutions also have used *Project SAILS* as their reference in establishing their own in-house IL tests. *University of Arizona Libraries* (UAL) reported initiative to develop and validate in-house test items using *Project SAILS* items for construct validity (Mery et al., 2011).

The ILT computer-based, multiple choice test are described in details in a literature *Enhancing skills, effecting change: Evaluating an intervention for students with below-proficient information literacy skills* (Latham, Gross, 2011). It is a 60-item test, which measures competency in four of the five ACRL standards. Three levels of competency are defined by the test developers: 90 % or greater is regarded advanced in IL competency; 65 % to 89 % is considered competent; and less than 65 % is considered below proficient. The goal of the test is to develop a reliable and validated test that could be adopted by other institutions to measure IL competencies based on *ACRL Standards*(Cameron et al., 2007).

Besides RRSA, *Scale of Information Literacy Competency for Agriculture Postgraduate Students* (SOILCAPS) also contains a combination of multiple choice and true/false questions (Singh, Joshi, 2013). The instrument is developed for master's degree students at one of agricultural universities in India. Same as the three instruments discussed above, SOILCAPS is developed based on *ACRL IL Standard*. All of these assessments have undergone meticulous construction, validity, and reliability checks, and they have proven useful in evaluating information literacy competencies (Goebel et al., 2013).

Another instrument which measures information literacy competencies using test-based approach is *Threshold Achievement Test of Information Literacy* (TATIL). Unlike the other instruments, the test is designed and developed by *Carrick Enterprises* and is based on the recent *ACRLFramework for Information Literacy for Higher Education*. The test consists of four modules and each module relates one or more frame from the *ACRL Framework* (LeMire et al., 2021).

There are other IL tests established in-house as an effort to evaluate the outcomes of teaching of information literacy concepts and skills. *University of Maryland University College (UMUC)*

reported they have established their own in-house IL test to accommodate online students in a non -proctored environment (Mulherrin, Abdul-Hamid, 2009).

IL test assessments are also used in evaluating a specific group of students and to measure one or more components of IL. An assessment was developed to evaluate source evaluation competencies (one the of component in IL) to measure journalism students (Bobkowski, Younger, 2020). The assessment was also developed based on the *Framework for Information Literacy for Higher Education*. Another test-based IL assessment which measure a specific components or competencies in IL is discussed in a research. The research selected role-playing method to assess students in two IL competencies, namely searching for information and evaluating sources (Rieh, et al., 2022). Finally, *Information Literacy Survey for Upper Secondary Students* (ILSUS) is developed to measure information literacy competencies of upper secondary students in Japan through Computer-Based Testing (CBT). The instrument implemented large-scale survey based on *Item Response Theory* (IRT) (Shinohara, Horoiwab, 2021). The survey consists of 87 items in three (3) format: *multiple choice*, *open resources* and *others*, which had to be answered by operating the application. The research concluded that approximately 70 % of Japanese students who have achieved competence level 4 or higher had a clear comprehension of information ethics and information security. They were also capable of successfully completing activities that involved complicated and extensive amounts of information.

Information Literacy Perception-based Assessment

Perception-based assessment or self-assessment is another approach in evaluating and assessing information literacy competencies. The assessment is based on students' perceived of their IL competencies and skills. It has been one of popular techniques for assessing professionals' and students' information literacy (Mahmood, 2016). As self-assessment is measuring subjective abilities, from an educational psychology perspective, it is a viable method. This method is frequently seen as a fundamental idea that underpins human motivation, performance achievements, and emotional well-being in their perceived capabilities in specific areas. As a result, IL perception-based assessment can have a favourable impact on effort output and task perseverance, particularly when faced with challenges (Schunk, 1984).

The most used IL self-assessment instrument is *Information Literacy Self-Efficacy Scale (ILSES)* (Mahmmod, 2017). This instrument's purpose is to measure students' IL self-efficacy, and it is tested with highly reliability and validity. Kurbanoglu et al. described in details the development of ILSES and how well it measures what it intended to assess (Kurbanoglu et al., 2006). Participants in the research was 374 teachers in private and public schools. Although not elaborates in details, the study "carefully considered and compared" previously publish definitions and standards for IL including Doyle' Rubrics for Information Literacy, AASL & AETC's Information Literacy Standards and ACRL's Information Literacy Competency Standards for Higher Education (Kurbanoglu et al., 2006: 738). The 28-item scale was also used in developing IL scale in other fields.

Medical-specific scale, *Information Literacy Self-Efficacy Scale for Medicine*(ILSES-M) is based on the ILSES. The 35-item scale is an expanding version through the inclusion of medical discipline-specific items (Richardson, 2019). In recent years, due to the changes in the information landscape and as a result of the internet's popularity that have occurred since the scale's inception, ILSES also has been investigated its validity. The seven-factor model to become a four-factor model based on confirmatory factor analysis (CFA) literature and model fit indices employed in their research of 253 undergraduate learners (Sommer et al., 2021).

Another instrument using IL perception-based approach is *Perception of Information Literacy Scale* (PILS) (Doyle et al., 2019). Developed in 2019 and based on the *ACRL Framework for Information Literacy for Higher Education*, the instrument evaluates information literacy competencies by figuring out how graduate students view their information literacy abilities, especially in relation to where they place themselves on the comprehending continuum of IL competencies. It measures self-perceptions of IL competency on a developmental scale from novice to expert. The scale consists of 36 items measuring seven different information literacy constructs.

Pinto describes in details on the design of self-assessment approach of IL, namely *IL-HUMASS Survey on Information Literacy* (Pinto, 2010). The assessment's main target is to be applied to a population of students, teachers and librarians holding various degrees in social science and humanities in Spain and Portuguese universities. The 26-item survey is grouped into four categories consist of information search, assessment, processing and

communication/dissemination. Three self-reporting dimensions consists of motivation, self-efficacy and preferred source of learning are also added in this IL survey (Maidin et al., 2022). The self-assessment are also being used to examine the attitudes and opinions of psychology students in Spain and Portugal on the importance of belief-in-importance (BI), self-efficacy (SE), and favourite source of learning (SL) for information literacy (IL) competences (Pinto et al., 2021).

Information Literacy Skills Questionnaire (SPIL-Q) is another IL measurement tools which use perception-based as its approach in getting information from the students. This secondary instrument requires graduate business students to response six statements in a 5-point Likert scale with 1 (strongly disagree) to 5 (strongly agree) (Michalak, Rysavy, 2016). In the research, SPIL-Q is used in corporation with IL test-based Information Literacy Assessment (ILA) to determine the students' perceptions of their IL skills and their actual test-assessed IL skills.

Information Skills Survey (ISS), meanwhile, is another information literacy competencies self-report or perception-based assessment. Developed by the *Council of Australian University Librarians* (CAUL) in 2003, ISS is referred to assess the six standards presented in the *Australia and New Zealand Information Literacy* (ANZIIL) framework (Catts, 2003). The test has 20-item forms for general social sciences and 28-item form for law. ISS employed a 4-point Likert scale (never, sometimes, frequently, always) to assess their information literacy knowledge and proficiency in a range of information literacy tasks (Sparks et al., 2016). Development process by another statistically validated self-assessment scale for assessing IL is discussed. The scale is developed by integrating information literacy and academic writing (Yu, 2023). In Pakistan, one cross-sectional survey was conducted to determine students perceived of IL. According to the study, students' perception of their information proficiency was found to be somewhat above the average, and there were no statistically significant differences seen depending on gender or academic year (Irfan et al., 2024).

Finally, *Informed Learning scale* is another tool developed based on students' perceptions of using information to learn. Data produced from this assessment scale are used by instructors to refine learning outcome, evaluation and teaching activities (Flierl et al., 2021).

However, not all perception-based approach assessment tools are used to assess IL proficiency and competencies. Some of the tools are used to create metacognitive awareness and perceived use of IL knowledge. *Information Literacy Reflection Tool* (ILRT) is one of information literacy tools which are used to create metacognitive awareness instead of only for evaluating IL competencies. It is established to create metacognitive awareness, critical reflection and acts as a teaching tool and a formative assessment. In line with PILS which is based on the *ACRL Framework for Information Literacy for Higher Education*, the scales developed in ILRT "promotes awareness of and reflection on IL concepts and strategies, but does not measure competency, skill, or achievement" (Robertson et al., 2022). The ILRT employs a Likert-style scale to ask participants to rate their own reflections using frequency percentage of time. The statement item consists of "true of me", and range from very untrue of me (0 % of the time) to very true of me (100 % of the time). Another self-reported instruments that is developed to measure metacognitive awareness of information literacy are the *Metacognitive Strategies for Library Research Skills Scale* (MS-LRSS) (Catalano, 2017). Instead based on IL standards and guideline, initial items in MS-LRSS are based on two metacognition instruments as a framework, namely the *Metacognitive Awareness Inventory (MAI)* and the *State Metacognitive Inventory (SMI)*. After expert review procedure, however, items written for each subscale represents major information literacy skills as defined by the *ACRL Standards*. Respondents indicate their agreement with 21-item statements based on a 5-point Likert scale from *Not at all* (1) to *Extremely* (5). The scales were deployed to students from two private post-secondary institutions.

Perception-based assessment, however, is not a replacement for testing or examining actual information literacy competencies and skills (Mahmood, 2013; Rosman et al., 2015). Many literatures reported that people always overestimate their IL capabilities compared to their real capabilities when performing IL perception-based assessment. This behaviour, which is referred as Dunning-Kruger Effect proposed by Justin Kruger and David Dunning of Cornell University (Kruger, Dunning, 1999). Although the four studies conducted by them are in the areas of humour, logical reasoning, and English grammar, many studies have confirmed or substantiated this Dunning-Kruger Effect with other areas, including in information literacy (Gross, Latham, 2009; Mahmood, 2013).

Combination of test-based and perception-based assessment

Besides objective-based assessment and self-perception assessment, there are other literature reported using the combination of both assessment approaches. One of them is combining IL objective-based assessment approach (PIKE-P Test) with IL self-efficacy, which is one form of IL self-assessment (Rosman et al., 2015). They also suggest that both tests to be complemented with several standardised information searching tasks. The self-assessment, as suggested by them, should be taken place at the end of the testing practice.

Another assessment developed using combination of both approaches is Scale of Information Literacy Competency for Agriculture Postgraduate Students (SOILCAPS) (Singh, Joshi, 2013). The instrument is developed based on the ACRL Information Literacy Standards for Science and Engineering/Technology. The tool is to be used in pre-test and post-test setting and consist of 2 parts. Part 1 is a 37 multiple choice questions & 25 true/false items and Part 2 consists of non-scoring questions. The non-scoring questions are related to the use of various information resources and experience in locating and utilizing data for educational objectives.

Finally, an innovative assessment tool is introduced, specifically developed to gauge the level of visibility of information literacy services offered by Spanish university libraries. MeLIL, which stands for *Metrics for Library Information Literacy*, addresses the latest challenges in information literacy, including mobile learning, fake news, data literacy, and open science. The instrument comprises six criteria and 38 indicators (Pinto et al., 2024).

4. Results

Information literacy objective test-based approach and perception-based approach are two approaches commonly used in determining level of IL competencies and skills. Most literature in this review indicate how the reliability and validity of these assessment instruments have been checked. This condition indicates the quality of the assessment tools. Literature on test-based information literacy assessments emphasizes the use of standardized tests, objective measures, and performance tasks to evaluate students' abilities to recognise the need for information, locate, evaluate, and use information effectively. These assessments are valued for their reliability and validity, providing quantitative data that can be compared across different populations and time periods. However, they often fail to capture the nuanced, contextual, and process-oriented aspects of information literacy. The primary limitation is their focus on end results rather than the learning process. Perception-based assessments meanwhile, focus on learners' self-reported confidence and perceived abilities in information literacy skills. These tools provide insights into students' attitudes, motivations, and self-efficacy, which are critical for fostering lifelong learning. While this approach offers valuable qualitative data, perception-based assessments are often subjective and may suffer from biases, such as over- or underestimation of information literacy abilities. They are often criticized for their lack of objectivity and the difficulty in measuring actual skill acquisition.

Integrating test-based and perception-based assessments provides a more comprehensive evaluation of information literacy. The limits of each approach can be addressed by combining test-based approach measurements with perception-based assessment, which provides a balanced assessment of the skills learned as well as the learner's self-awareness and confidence. This holistic approach can enhance instructional strategies, support personalized learning, and improve overall educational outcomes.

However, there are other IL assessment type which can be used such as portfolio, essay, observations, simulation and final grades. These subjective-based assessment approaches are discussed in a review by Walsh (Walsh, 2009). Many factors should be considered in determining IL assessment approach when deciding to design assessment tools. The main factors is the need to balance between the purposes and objectives of the IL assessment with the capability to establish tool that can assess the subjects' IL competencies and skills.

5. Conclusion

Assessing and evaluating information literacy (IL) competencies is essential for comprehending and improving the efficiency and effectiveness of the IL educational programs. The purpose of this assessment is to measure students' competence in IL, provide direction for curriculum development, and enhance instructional methods. There are two main methods for assessing information literacy: test-based and perception-based approaches. Test-based assessments, such as multiple-choice questions and standardized test, provide unbiased and

measurable information about students' competencies and abilities. They are well regarded for their dependability and simplicity in management, but they may not fully capture the extent of students' comprehension and utilization of IL skills. Examples such as *Project SAILS* and ILT are effective in assessing general competencies but sometimes do not adequately cover the intricate and practical aspects of IL in real-world scenarios. Perception-based assessments, in contrast, depend on students' self-reported confidence and their perceived competencies. The *Information Literacy Self-Efficacy Scale* (ILSES) and the *Perception of Information Literacy Scale* (PILS) are useful tools for understanding students' attitudes, perceived abilities and self-awareness regarding information literacy. These evaluations can identify areas that need work and encourage a more profound involvement with IL concepts. Nevertheless, they are essentially subjective and susceptible to biases such as the tendency to overestimate own competencies and skills.

By integrating these two approaches, namely test-based and perception-based, a comprehensive perspective on students' information literacy skills can be obtained. This integration combines the objective assessment of competencies with an awareness of learners' self-perceptions and levels of confidence. This comprehensive method promotes personalized learning and improves educational outcomes by considering both the knowledge obtained and the learners' self-assessment. As a result, it leads to more effective training in information literacy (IL) and better curriculum design.

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Appendix 1

ERIC

Search on 12 December 2023, 517 results

Search term – Using 'Subject heading – MAINSUBJECT'. Limited by peer-reviewed ERIC journal and full-text only.

Mainsubject ((assessment OR measurement OR evaluation)) AND mainsubject (("information literacy" OR "information skills"))

ProQuest Education

Search on 13 December 2023, 210 results

Search term – Using 'Subject heading – MAINSUBJECT'. Limited by peer-reviewed journal and full-text only.

Mainsubject ((assessment OR measurement OR evaluation)) AND mainsubject (("information literacy" OR "information skills"))

EBSCO Academic Search Ultimate

Search on 15 December 2023, 14 results

Subject term – Using 'SU – Subject term' Limited by peer-reviewed journal and full-text only.

Subjectterms ((assessment OR measurement OR evaluation)) AND subjectterms (("information literacy" OR "information skills"))

EBSCO Education Source

Search on 15 December 2023, 11 results

Subject term – Using 'SU – Subject term' Limited by peer-reviewed journal and full-text only.

SU (assessment OR measurement OR evaluation) AND SU ("information literacy" OR "information skills").

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New Media in Health Communication for Development: the Impact of Social Television in Interactive Health Communication

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Abstract

Social television holds great promise for enhancing health communication across the world, especially Africa. By leveraging the power of social media and interactive broadcasting, health campaigns can reach wider audiences, engage viewers more effectively and contribute to better health outcomes across the continent. The importance of interactive health communication cannot be overstated in modern society. Health information dissemination has, with the explosion of digital technologies, transcended the constraints of time and space, enabling prompt, two-way dialogues between healthcare providers and the public. This paper examines the impact of the application of social television in health communication, investigating its potential to develop and improve the efficacy of health campaigns through interactive and participatory engagement. Drawing upon the Diffusion of Innovations Theory and the Social Cognitive Theory, the study provides a comprehensive analysis of how social television can influence health behaviours and outcomes. The findings suggest that social television's real-time feedback, personalised messaging and enhanced audience engagement position it as a critical tool for future health campaigns. However, challenges such as misinformation, privacy concerns and the balance between entertainment and educational value must be addressed. The paper concludes with a call to action for stakeholders to leverage the potential of social television and recommendations for strategic integration, audience engagement, content accuracy, privacy and security and ongoing research.

Keywords: development communication, interactive engagement, audience participation, health campaigns, health behaviour.

1. Introduction

In the vastly growing mediascape of development media communication, social television as a new media platform has carved out a niche as an innovative intersection between traditional broadcasting and interactive digital platforms (Siapera, 2018). Defined as a method of content delivery that combines television viewing with social media interaction, social television transforms passive consumption into an active, participatory experience (Smith, Telang, 2019). This synergy not only enriches the viewing experience but also opens new avenues for health communication strategies that leverage the power of social engagement. Moreover, development (media) communication is a field of study that examines how communication can be used to promote social change, particularly in developing countries (Okunna, 2015; Servaes, 2008).

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The significance of interactive health communication cannot be overstated in contemporary society. With the proliferation of digital technologies, health information dissemination has transcended the limitations of time and space, enabling instantaneous, two-way dialogues between healthcare providers and the public (Johnson, Ambrose, 2021). This interactive paradigm shift is crucial in addressing the dynamic and complex nature of health-related issues, fostering a more informed and health-conscious society.

Thesis statement: social television has emerged as a pivotal new media platform, enhancing the efficacy of health communication through interactive and participatory engagement. By integrating the reach and visual impact of television with the conversational dynamics of social media, social television offers a unique blend of entertainment and education, facilitating a more nuanced and impactful health dialogue (Bennett, Glasgow, 2020). This medium's potential to influence public health outcomes is profound, marking a significant step forward in the way health messages are crafted and received.

Aim and objectives: The paper aims to critically evaluate the impact of the application of social television toward the development and improvement of health communication strategies on public health outcomes. The study aims to contribute to the field by synthesising current knowledge and identifying areas for future research and practice. Specific objectives of the paper are 1) to explore how social television has been integrated into health communication campaigns; 2) to assess the effectiveness of social television in engaging audiences and promoting health behaviour change; 3) to identify the strengths and weaknesses of social television as a tool for health communication; 4) to examine the potential challenges and ethical considerations associated with the use of social television in health campaigns; and 5) to provide recommendations for optimising the use of social television in future health communication efforts.

Research questions: Furthermore, the paper attempts to answer the following research questions: 1) how has Social Television been used in health communication campaigns to date?; 2) what are the demonstrated effects of Social Television on audience engagement and health behaviour change?; 3) What are the key advantages and limitations of using Social Television for health communication?: 4) what challenges and ethical issues need to be considered when implementing Social Television in health campaigns?: and 5) how can health communicators leverage the features of Social Television to enhance the impact of their campaigns?

*The Landscape of Health Communication: Historical perspective on health communication methods:*The annals of health communication are replete with a myriad of methods, each reflecting the zeitgeist of its era. Historically, health communication was an integral part of public health education and training, primarily delivered through didactic lectures and printed materials. This approach was largely unidirectional, with a focus on disseminating information from health authorities to the public (Malikhao, 2016). As societies evolved, so too did the methods of communication, with the advent of radio and television providing new platforms for health messages to reach a wider audience (Colle, 2003).

*The role of traditional media in disseminating health information:*Traditional media, encompassing radio, television and print, have long been the stalwarts of health information dissemination. These mediums have played a pivotal role in educating the public on health matters, shaping health behaviours and influencing public opinion on health policies (Dunn, Woo, 2019). Despite the rise of digital media, traditional media continue to be regarded as credible sources of health information, particularly during global health crises such as the COVID-19 pandemic (Najie, Widati, 2021).

*The shift towards interactive communication with the advent of new media:*The digital revolution has ushered in a paradigm shift towards interactive communication, characterised by the emergence of new media platforms such as social media, blogs and online forums. This shift has transformed the landscape of health communication, enabling a two-way exchange of information and allowing individuals to actively engage in their health-related decision-making processes (Stoumpos et al., 2023). The interactive nature of new media has not only democratised health information but also presented new challenges in ensuring the accuracy and reliability of health content (Kim et al., 2019).

Social television as a new media:*Definition and characteristics of social television:*Social television represents the confluence of television broadcasting and social media, creating a platform where viewers engage with televised content and each other simultaneously. This phenomenon allows for real-time interaction and sharing of television experiences across social

networks, effectively turning individual viewing into a communal event (Kim et al., 2019). Social television is characterised by its ability to foster audience participation, create communities around television content and facilitate a shared viewing experience, regardless of geographical boundaries (Kim et al., 2019; Kim et al., 2021).

Comparative analysis with traditional health communication methods: When juxtaposed with traditional health communication methods, social television stands out for its interactive capabilities. Unlike the one-way dissemination of information typical of traditional media, social television encourages a two-way dialogue, allowing viewers to contribute to the conversation and influence the narrative (Yang et al., 2023). This interactivity enhances the personalisation and relevance of health messages, potentially increasing their impact on health behaviours (Kim et al., 2019; PMC, 2020).

*Case studies of successful social television initiatives:*One illustrative case study is the repositioning of Sun TV's channel, Sun Life, which leveraged social television to target a younger, digitally-native demographic. Through a strategic use of social media, Sun TV successfully enhanced viewership and engagement by aligning content with the consumption patterns and preferences of its target audience (Media Samosa, 2020). Another example is the advocacy work by Caribbean Natural Resources Institute (CANARI), which used social television to amplify its message and foster community involvement in governance and development processes (CANARI, 2018).

Advantages of Social Television in Health Communication:*Enhanced audience engagement:*Social television has revolutionised the way audiences engage with health communication. By integrating social media tools with television programming, broadcasters can foster a more dynamic and participatory viewing experience. This enhanced engagement is evidenced by increased interactions with televised content, as viewers are encouraged to share opinions, participate in polls and become part of a larger conversation about health topics. The immediacy of social television allows for a more immersive experience, which can lead to greater retention of health information and a deeper understanding of health issues (Chen, Wang, 2021; Kanchan, Gaidhane, 2023).

Real-time feedback and interactivity: The interactivity of social television provides real-time feedback from viewers, creating a two-way communication channel between broadcasters and the audience. This immediacy allows health communicators to gauge audience reactions, answer questions and address misconceptions as they arise, thereby enhancing the effectiveness of health messages. Real-time interactivity also enables a more personalised approach to health communication, as viewers can receive tailored responses to their concerns (Chen, Wang, 2021; Kanchan, Gaidhane, 2023; Kim et al., 2019).

*Personalisation of health messages:*Social television allows for the personalisation of health messages, making them more relevant to individual viewers. By utilising data analytics and viewer feedback, health communicators can customise content to address specific demographics, cultural backgrounds and personal health concerns. This level of personalisation ensures that health messages resonate more deeply with viewers, potentially leading to positive changes in health behaviours (Chen, Wang, 2021; Kanchan, Gaidhane, 2023; Kim et al., 2021).

*Broader reach and accessibility:*The accessibility of social television extends the reach of health communication to a broader audience. With the proliferation of digital devices, health messages can be disseminated across multiple platforms, ensuring that they are available to individuals regardless of location or socioeconomic status. This increased accessibility is crucial for public health campaigns, as it allows for the distribution of vital health information to diverse populations (García-Perdomo, 2021), including those who may have previously been underserved by traditional media (Chen, Wang, 2021; Kanchan, Gaidhane, 2023; Kim et al., 2019).

Challenges and Considerations:While the potential benefits are clear, there are challenges to consider. These include addressing misinformation and ensuring content accuracy, privacy concerns and data security, balancing entertainment and educational value and ethical considerations in health message dissemination. Moreover, balancing entertainment with educational value is crucial to keep the audience engaged without compromising the quality of health information (Chen, Wang, 2021).

A*ddressing misinformation and ensuring content accuracy:*In the realm of social television, the rapid dissemination of information presents a formidable challenge in mitigating the spread of misinformation. Ensuring content accuracy is paramount, as health-related misinformation can have dire consequences. Strategies to combat misinformation include employing fact-checking protocols and fostering media literacy among audiences. It is essential to establish trust and

accountability, particularly in journalism, where the veracity of information is critical (Chen, Wang, 2021; Kanchan, Gaidhane, 2023; García-Perdomo, 2021; Yang et al., 2023).

*Privacy concerns and data security:*The integration of social media with television raises significant privacy concerns and data security issues. Protecting users' privacy requires a careful balance between personalisation and the risk of data exposure. Anonymisation techniques and robust data protection measures are necessary to safeguard user information while still allowing for the personalisation that makes social television engaging (Chen, Wang, 2021; Kanchan, Gaidhane, 2023; Kim et al., 2021).

*Balancing entertainment and educational value:*Social television must navigate the delicate balance between entertainment and educational value. While the primary aim is to inform and educate, the content must also be engaging to capture the audience's attention. Employing entertainment-education strategies can enhance the appeal of educational messages, making them more relatable and memorable for viewers (Kim et al., 2019, 2021).

*Ethical considerations in health message dissemination:*Ethical considerations in disseminating health messages through social television are complex. Issues include respecting viewers' autonomy, avoiding the perpetuation of social inequities and ensuring that content does not infringe on privacy or freedom of choice. Public health researchers and broadcasters must adhere to ethical principles that prioritise the protection of individual users (Colle, 2003; Hunter et al., 2018).

2. Materials and methods

The methodology for the literature review research paper was designed to ensure a semi-systematic analysis of existing literature related to social television and its impact on health communication. The following steps outline the process:

Defining the scope: The scope of the literature review was defined by the research questions, which aimed to explore the role of social television in health communication and its potential to influence health behaviours.

Database and source selection: Relevant databases such as PubMed, PsycINFO and Google Scholar were selected for the literature search. Sources included peer-reviewed journal articles, books, conference proceedings and reputable online publications.

Search strategy: A combination of keywords and phrases related to social television, health communication, audience engagement and interactive media was used. Boolean operators (AND, OR, NOT) were employed to refine the search results.

Inclusion and exclusion criteria: Criteria were established based on publication date (within the last 10 years, 2023-2014), language (English) and relevance to the research questions. Studies that did not focus on social television or its application in health communication were excluded.

Screening and selection: Titles and abstracts were screened for relevance, and full texts were reviewed to determine their suitability for inclusion. The reference lists of selected articles were also examined for additional sources.

Data extraction: Key information was extracted from each source, including the authors, year of publication, study objectives, methodology, results and conclusions.

Quality Assessment: The quality of the sources was assessed using established criteria such as the clarity of research objectives, appropriateness of the methodology and the rigour of the analysis.

Synthesis and analysis: Data were synthesised to identify common themes, trends and gaps in the literature. A narrative approach was used to integrate findings and provide a comprehensive overview of the research topic.

Justification of methodology: The chosen methodology was justified by its ability to provide a thorough and unbiased review of the literature, contributing to the reliability and validity of the research findings.

3. Discussion

Research Gaps and Future Studies: Despite the promising prospects of social television, there are notable research gaps that need addressing. Current literature indicates a need for more comprehensive methodologies that assess the impact of social television on health behaviour change. Additionally, there is a call for research that explores the effectiveness of social television in various sociocultural contexts and its ability to respond rapidly to public health emergencies. Future studies should also consider the characteristics of messages, digital communication strategies and the attitudes and perceptions of healthcare providers.

Future implications and research directions: *Potential for social television in global health campaigns:*Social television holds immense potential in global health campaigns, offering a platform that can transcend geographical boundaries and cultural barriers. Its ability to engage audiences in real-time and foster community dialogue makes it an ideal medium for widespread health initiatives. Studies suggest that social media, a key component of social television, can significantly contribute to health promotion beyond mere awareness, potentially influencing long-term behaviour change. However, the long-term impact of such campaigns requires further exploration to understand sustainable behavioural changes (Chen, Wang, 2021; Kanchan, Gaidhane, 2023; Kim et al., 2019, 2021).

*Predictions for the evolution of interactive health communication:*As we look towards the future, interactive health communication is predicted to evolve significantly. The integration of digital health solutions is expected to increase exponentially, as healthcare systems develop trust in technology due to peer usage, cost benefits and observed improvements in patient health outcomes. The versatility of remote patient monitoring and other digital health tools will likely lead to more personalised and community-based care, reshaping the landscape of health communication (Chen, Wang, 2021; Kanchan, Gaidhane, 2023; Kim et al., 2019).

The potential for social television in health campaigns, especially in Africa, is significant, given the continent's rapidly increasing access to digital technology and the widespread use of social media. Social television, which combines traditional broadcasting with interactive social media platforms, offers a unique opportunity to engage audiences in health-related discussions and interventions (Chen, Wang, 2021; Kim et al., 2019).

*Enhanced engagement and education:*Social television can enhance audience engagement by allowing viewers to participate in health campaigns actively. This can be achieved through interactive features such as live polls, Q&A sessions and social media discussions that accompany the broadcast. Such engagement not only increases the viewers' knowledge but also empowers them to take charge of their health. For instance, in South Africa, social media has been identified as a tool with the potential to scale health promotion programmes due to its low cost and ability to create virtual communities (Abroms, 2019; Chen, Wang, 2021).

*Overcoming geographical barriers:*One of the most significant advantages of social television is its ability to overcome geographical barriers. In many parts of the developing world, especially in Africa, access to healthcare facilities and professionals is limited. Social television can bridge this gap by providing health education and information to remote and underserved areas, thus playing a crucial role in public health campaigns (Abroms, 2019; Gunasekeran et al., 2022; Kim et al., 2021).

*Real-time feedback and data collection:*The interactive nature of social television allows for real-time feedback from the audience. This can be invaluable for health organisations to gauge the effectiveness of their messages and campaigns. Additionally, data collected from audience interactions can help tailor future health interventions to be more effective and targeted (Chen, Wang, 2021; Gunasekeran et al., 2022; Kim et al., 2019).

4. Results

Theoretical Framework:The theoretical framework of research into social television as a new media platform for health communication can be anchored on two key theories: the Diffusion of Innovations Theory (DIT) and the Social Cognitive Theory (SCT).

Rogers (Rogers, 2003) defines diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). DIT explains how new ideas, products, or technologies spread within a social system over time. DIT posits that media, as an agent of change, can influence audiences to adopt new behaviours or innovations through a series of stages: knowledge, persuasion, decision, implementation and confirmation. In the context of social television, this theory can explain how health communication campaigns disseminated through interactive TV can lead to widespread adoption of health behaviours among the population (Rogers, 2003).

Social Cognitive Theory (SCT), on the other hand, emphasises the role of observational learning, imitation and modelling in behaviour change. Social television, with its interactive features, allows viewers to observe health behaviours being modelled, discuss them and receive reinforcement through social media platforms, thus influencing their own health decisions and actions. SCT, proposed by Bandura (Bandura, 1989, 2001), emphasises observational learning, imitation and modelling in behaviour change. Social television, with its interactive features, allows viewers to:

– Observe health behaviours being modelled.
– Discuss these behaviours.
– Receive reinforcement through social media platforms.
This influences viewers' own health decisions and actions (see Bandura, 2001).

5. Conclusion

Social television holds great promise for enhancing health communication across the world, especially Africa. By leveraging the power of social media and interactive broadcasting, health campaigns can reach wider audiences, engage viewers more effectively and contribute to better health outcomes across the continent. Furthermore, the transformative potential of social television in the realm of health communication cannot be overstated. As a medium that seamlessly integrates the interactive capabilities of social media with the broad reach of traditional television, social television stands poised to revolutionise the dissemination and reception of health information. The theoretical frameworks, particularly the Diffusion of Innovations Theory and the Social Cognitive Theory, provide a robust foundation for understanding how social television can influence health behaviours and outcomes. These theories underscore the importance of media as a catalyst for change and the power of observational learning and modelling in shaping health decisions.

The thesis of this research – that social television has emerged as a pivotal new media platform, enhancing the efficacy of health communication through interactive and participatory engagement – has been substantiated by the evidence presented. The integration of real-time feedback, personalised messaging and enhanced audience engagement positions social television as a critical tool in the future of health campaigns, especially in reaching diverse and widespread populations.

Therefore, it is imperative for stakeholders in health communication – ranging from policymakers and healthcare providers to media professionals and public health researchers – to recognise and harness the potential of social television. There is a call to action for these stakeholders to collaborate in creating content that is not only informative and accurate but also engaging and accessible. By doing so, they can ensure that health communication is not just a broadcast but a dialogue, one that empowers individuals and communities to make informed health choices. Future research should focus on identifying the most effective strategies for implementing social television in various African contexts and measuring its impact on public health.

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An Analysis of Graduate Theses in Digital Literacy in Türkiye

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Abstract

This study aims to explain and examine how we can use and develop digital literacy concepts and skills in Türkiye by investigating graduate theses. This study is carried out on digital literacy graduate theses and dissertations in the Turkish Council of Higher Education National Thesis Center between January 1, 2019, and June 1, 2024, in Türkiye. Graduate theses are analyzed using the content analysis method. A detailed and developed search was conducted for the digital literacy keyword at the Turkish Council of Higher Education National Thesis Center. This study is limited to the topic of digital literacy and graduate digital literacy theses and dissertations. The study's findings indicate that the problem of digital literacy is becoming more and more important. Graduate theses in communication science make up about 12 % of all theses. The most prominent approach is the survey method in examined graduate theses followed by mixed method. A total of 128 graduate theses – 108 master's degree theses, 19 PhD dissertations, and 1 doctor of arts – are analyzed in this study. It is observed that education science, computer and instructional technologies, and Turkish and social studies education departments are classified as the most written areas of research on digital literacy.

Keywords: digital literacy, content analysis, Türkiye, graduate theses, new communication technologies.

1. Introduction

Societies in the technologically advanced world of today differ in how they use and have access to communication tools. As a result, it is believed that each society exists at a distinct age. Regretfully, the differences between developed, emerging, and underdeveloped nations in terms of technology, social, and economic aspects are widening daily. Disparities may be exemplified in a variety of areas, including internet accessibility, GDP, educational rights, national economic development, and income level. The majority of social inequalities, according to Zheng and Walsham (Zheng and Walsham, 2021), are caused by digital communication technologies. Focusing on digital accessibility, literacy, skill, digital legislation, and the use of digital technologies, the digital divide has persisted. Digital technologies have begun to become killer applications for interpersonal communication and interaction between individuals. However, the spread of digital technology has made disparities in digital skills, access, and usage rates among sociodemographic categories worldwide more pronounced. In this instance, the exponential advancement of digital technologies has caused social inequities to worsen over the past few decades.

Time, place, relationships, connections, and human-machine interactions have all changed as a result of the Internet and digital communication technology. Everyday human-machine interactions are what made the famous statement by communication scientist Marshall McLuhan that "technology is an extension of humans" possible (Martinez-Bravo et al., 2022). For this reason,

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we can assert that in the words of Marshall McLuhan, technology, human-machine interaction, and the rapid development of the internet and communication technologies have impacted and transformed societies globally in every aspect of life — social, political, technological, and otherwise. To survive, contribute to society, and be a decent citizen, one must possess a comprehensive set of skills and knowledge known as 21st-century skills, which include literacy, comprehension, critical thinking, social skills, and digital literacy. Especially with the spread of information and communication technologies, digital literacy skills are needed for people to live a sustainable future, contribute to global citizenry and development, and effectively use digital tools (Bravo et al., 2021: 78). We can point out that digital literacy is an inseparable part of daily life that forms part of this digital world, both present and future.

Digitalization and the ever-growing significance of new communication technologies are changing everything from work to play, from health to education. These changes have led to the development of new knowledge in the areas of digital literacy, digital skills, and internet usage. In the current digital world, being digitally literate means knowing how to use, evaluate, and comprehend digital resources effectively. Digital literacy is a developing topic in Türkiye and all around the world with the spread and use of digital technologies and digital communication tools. Therefore, this study aims to explain and examine how we can use and develop digital literacy concepts and skills in Türkiye by investigating graduate theses. Additionally, the goal of this study is to advance the fields of digital literacy, artificial intelligence literacy, data literacy, new media literacy, information and communication technologies, digital literacy, digital comprehension, and digital reading subjects.

In the current digital era, digital literacy is one of the most important abilities for every person. However, in the literature, the use and dissemination of information and communication technology, as well as digital literacy, are broad concepts. As a result, many interpretations and applications of the notion of digital literacy are first discussed. Paul Gilster originally introduced the term "digital literacy" in 1997. It refers to the capacity to use and comprehend data and digital materials in digital settings (Phuapan et al., 2016: 25). The capacity to use information and communication technologies, particularly web-based services and the internet, is referred to as digital literacy (Gilster, 1997: 3). The skills necessary to effectively use means, texts, tools, and communication technologies are known as digital literacy. These skills also include critical thinking, analysis, creativity, and ethical thinking in digital technology environments. Collaboration, teamwork, and active participation are also included (Suwana, 2021: 2). Additionally, digital literacy refers to a set of abilities required to access, comprehend, and stay abreast of new ideas, agendas, and information in the contemporary information age, as well as to actively participate in the digital world and digital societies (Baron, 2019: 1). New media literacy refers to the social and cultural competencies that are fostered through networking and are based on fundamental literacy, research abilities, and media critical-analysis competencies (Suwana, 2021: 2). Eden et al. (Eden et al., 2024: 688) posit that digital literacy means the ability to effectively examine and evaluate, create digital contents, texts, and videos, and understand new information.

Digital literacy is one of the paramount concerns among countries with increasing digital inequality in terms of digital access, digital education, digital laws, digital services, and so on. It was determined that five digital literacy or information computer technology skills are needed: access, manage, integrate, evaluate, and create (Phuapan et al., 2016: 25).

Digital literacy is a combination of knowledge of digital means, critical thinking, and social relationships (Mishra, Sharma, 2018). Digital literacy involves a variety of skills, such as cognitive, social, sociological, motoric, emotional, and so on. Therefore, this skill needs to more efficiently use, understand, evaluate, and examine digital communication technologies and digital tools. By the way, digital literacy in modern digital societies is a survival skill that exists in all digital settings (Eshet-Alkalai, Amichai-Hamburger, 2004: 421). Meanwhile, digital literacy compiles practical skills, social skills, awareness, and competencies for users to use, access, understand, examine, evaluate, communicate with others, and create digital content (Iordache et al., 2017: 10). In this context, Eshet-Alkalai and Amichai-Hamburger (Eshet-Alkalai, Amichai-Hamburger, 2004) classified digital literacy into five dimensions: photo-visual literacy skill, branching skill, reproduction literacy skill, information literacy skill, and socio-emotional skill.

1. Photo-visual literacy skills need cognitive skills to create creative and innovative photo-visual communication with the environment.

2. Branching skills provide multidimensional thinking skills to understand complex phenomena or issues.

3. Reproduction literacy skills enable you to edit text, video, and digital content. This skill is defined as the ability to create new meanings and new perspectives by reproducing.

4. Information literacy abilities include the analysis and evaluation of data and the astute gathering of information.

5. Social-emotional competency encompasses the social and emotional aspects of using digital devices. This literacy skill is the most advanced and intricate of all of them.

According to Spires et al. (Spires et al., 2018), digital literacy is classified into three different sections: locating and consuming digital content, forming digital content, and communicating digital content. All dimensions need critical evaluation to use, understand, evaluate, and examine digital content. Therefore, we indicate that digital literacy is an ability that every digital citizen needs to effectively use, manage, design, and communicate with others in digital settings. With information and communication technology, all of us need to have digital literacy skills. This situation paves the way for new media literacy concepts such as data and artificial intelligence literacy. According to Kavut (Kavut, 2024: 232), data literacy is the capacity to communicate, analyze, read, and comprehend information to assist organizations in making better decisions, performing better, creating data visualizations, and managing more effectively. For this reason, we can argue that people in digital societies require new skills like media literacy, data literacy, and literacy to function on digital platforms, maintain digital profiles, produce creative and useful digital content, and take advantage of services like digital banking, e-government, and e-health.

In this context, Bravo et al. (Bravo et al., 2021: 92) point out that digital literacy may be explained by the six basic ideas:

1. In the 21st century, digital literacy means reading, understanding, comprehending, evaluating digital content, and communicating with others in digital environments.

2. Digital skills are a fundamental skill that is becoming necessary in the 21st century.

3. Digital literacy is a holistic concept that includes a variety of approaches, areas, abilities, and perspectives.

4. Digital literacy is a set of abilities, values, competencies, and information.

5. Digital literacy requires and provides safe, reliable, efficient, and effective usage of information and communication technologies, state-of-the-art technologies, digital tools, and applications.

6. Digital literacy supports access to the digital world and digital settings in society by providing an equal digital future and decreasing digital inequality.

2. Materials and methods

This study aims to explain and examine how we can use and develop digital literacy concepts and skills in Türkiye by investigating graduate theses. In the context of this aim, the following research questions are investigated:

Research Question 1: What is the distribution of graduate theses according to years?

Research Question 2: What is the distribution of theses according to the type of thesis?

Research Question 3: What are applied methods in graduate theses?

Research Question 4: Which sampling types are preferred for graduate theses?

Research Question 5: What is the distribution of graduate theses according to universities?

Research Question 6: What is the distribution of graduate theses according to public or foundation university rates?

Research Question 7: What is the distribution of graduate theses according to the area of research?

Research Question 8: What is the distribution of graduate theses according to the type of respondents?

This study is carried out on digital literacy graduate theses and dissertations in the Turkish Council of Higher Education National Thesis Center between January 1, 2019, and June 1, 2024, in Türkiye. In this study, the patterns of graduate theses, types of theses, used methods, areas of research, types of respondents, university preferences, and sampling are presented. It is applied as a content analysis method by analyzing graduate theses. A detailed and developed search at the Turkish Council of Higher Education National Thesis Center is conducted for the digital literacy keyword (Turkish..., 2024). This study has two stages: a digital literacy literature review and an

examination of digital literacy-based graduate theses in the Turkish Council of Higher Education National Thesis Center. This study is limited to the topic of digital literacy and examines graduate digital literacy theses and dissertations.

3. Discussion

The consequences, significance, and outcomes of digital literacy, as well as its use and the relationship between the digital divide and digital literacy, are assessed in this section based on a review of the research and its applicability to various cultures, institutions, individuals, and age groups. In order to stay relevant in the digital age and reduce the digital divide in society, digital literacy is crucial. Harvey et al. (Harvey et al., 2023) researched the costs and challenges of the digital divide in the United Kingdom in terms of electronic government, digital literacy, and the digitization of public services. The findings of this study show that despite the development of digital communication technologies, some people in the UK do not keep up with the current times, and some people lack digital skills, especially the elderly population. Polizzi (Polizzi,2020) indicates that media literacy and media education in England require educationalists and policymakers to examine and evaluate online content. Digital literacy is defined as the skill of evaluating digital content involving a variety of usages of digital tools in all digital environments in this study. Tinmaz et al. (Tinmaz et al.,2022) emphasize that some skills, such as critical thinking, problem-solving skills, and digital skills, affect the level and success of digital literacy. Digital literacy skills enable correct decision-making and implementation.

Digital literacy provides opportunities in both social and business life. Firstly, digital literacy allows employees to access, examine, retrieve, and analyze information transmitted in business and among businesses through digital communication technologies (Deschenes, 2024). Deschenes (Deschenes, 2024) collected data on public service workers. Digital literacy and digital technologies, especially in the in the post-pandemic era, enable the advent of several new work systems. According to this study's findings, digital literacy has given rise to the positive effect of the use of collaborative technologies in hybrid work environments, including both office and home-office work. Relatedly, digital literacy and digital communication have affected most sectors, primarily education. Farias-Gaytan et al. (Farias-Gaytan et al., 2023) examined digital transformation and digital literacy in higher education institutions. It has been found that higher education institutions and teachers use new education trends and digital communication technologies for didactic reasons. The pandemic triggered the need for digital literacy skills in education for both students and teachers. The effect of digital literacy on pre-school children is also important. Meng et al. (Meng et al., 2023) examine the effect of digital literacy and human-computer interaction on preschool children. It is evident that digital literacy has a positive effect in terms of reading skills, mental well-being, and resilience among preschool children.

Digital literacy skills and digital transformation have become a fundamental need for not only large-scale institutions but also small and medium-sized institutions in the digital era. Zahoor et al. (Zahoor et al., 2023) examine the importance of digital transformation and the effect of digital literacy on small and medium-sized enterprises (SMEs). This study's findings show that managers digital literacy impacts digital transformation through the use of digital communication technologies. Digital literacy is also associated with consumption habits. Digital technologies changed the consumption patterns of consumers from shop to online consumption and behavior.

Guess and Munger (Guess, Munger, 2023) analyzed digital literacy and online political behavior by conducting surveys on five different sample groups (Mechanical Turk, Facebook ads, high-skilled targeted sample, low-skilled targeted sample, and lucid) in the USA. This study emphasizes the importance and effects of heterogeneity in digital literacy skills. It is noted that sample groups are different from each other in terms of political knowledge, nudges and defaults, microtargeting, and campaign persuasion. Low et al. (Low et al., 2023) evaluated the concept of algorithmic imagination, the effects of algorithms on digital culture, and algorithmic awareness by #BookTok. BookTok is the home of book-related content on the TikTok social media platform. Algorithmic imaginings are shaped by interviewing BookTokers and indicate the elements of critical digital literacy. This study mentioned that many social media users have reached a point of relative comfort in co-existing alongside algorithmic agents thanks to the existence of algorithms.

The advent and spread of new communication technologies changed literacy, learning patterns, and digital literacy. Chang et al. (Chang et al.,2023) demonstrate the relationship between extended reality (XR) and digital literacy (DL). Eight digital literacy dimensions for

extended reality and metaverse technology were discovered as a consequence of this study. These dimensions include access and understanding, evaluation, ethics and well-being, interaction, collaboration, creation, problem-solving, and civil engagement and responsibility. After COVID-19, new technologies impacted higher education institutions libraries. Martzoukou (Martzoukou, 2021) examines online learning and digital literacy in academic libraries in the UK. Digital access to libraries is an important opportunity for equality in education. It is noted that academic libraries are well-positioned to increase awareness of digital literacy and current information among academic staff and students.

4. Results

The distribution of graduate theses by years, type, university, department, areas of research, preferred sampling strategy, percentages of foundation and public universities, and topics of theses are explained in this section.

Table 1. Distribution of graduate theses according to years

Thesis Year	*N*	*%*
2019	23	18 %
2020	22	17 %
2021	34	27 %
2022	28	22 %
2023	14	11 %
2024	7	5 %
Total	128	100 %

Table 1 shows that a total of 128 graduate theses on digital literacy were examined, according to the Turkish Council of Higher Education National Thesis Center. The most graduate thesis-written year is 2021. The 2024 year includes January 2024 through June 2024.

Table 2. Distribution of type of theses

Type of Thesis	*N*	*%*
Master's Degree	108	84 %
PhD	19	15 %
Doctor of Arts	1	1 %
Total	128	100 %

According to Table 2, the master's degree thesis rate constitutes 84 percent of the total. The PhD dissertation rate creates 15 percent of the total. As for doctor of arts, only one percent of total graduate theses.

Table 3. Distribution of theses according to methods

Method	*N*	*%*
Survey	92	65 %
Mixed	19	13 %
Quasi-experimental design	2	1 %
Literature review	3	2 %
Interview	7	5 %
Observation	2	1 %
Structural equation modelling	5	4 %
Document analysis	4	3 %
Focus group discussion	1	1 %
Content analysis	2	1 %
Multiple situation analysis	1	1 %
Action research	1	1 %

Method	*N*	*%*
Situation analysis	2	1 %
Discourse analysis	1	1 %
Total	142	100

Table 3 shows that the most commonly used method for graduate theses is the survey method. 65 percent of all these are conducted using the survey method. Mixed methods, involving both qualitative and quantitative methods, account for 13 percent of total graduate theses. Examined theses present a variety of methods and techniques, such as document analysis, content analysis, discourse analysis, and structural equation modelling, that are used in theses and dissertations. The least applied methods were focus group discussion, discourse analysis, multiple situation analysis, and action research, with 1 percent. A literature review, an interview, observation, document analysis, quasi-experimental design, content analysis, structural equalizing modelling, and scenario analysis were among the other techniques used in these theses. It has been discovered that certain graduate theses employ multiple methodologies. Thus, the total applied method and the total thesis rate are different, as the table illustrates.

Table 4. Distribution of theses according to universities

University	Master's N	%	PhD/ Doctor of Arts N	%
Afyon Kocatepe University			1	5 %
Ağrı İbrahim Çeçen University	1	1 %		
Akdeniz University	1	1 %		
Amasya University	4	4 %		
Anadolu University	2	2 %	2	10 %
Ankara University	3	3 %		
Ankara Hacı Bayram Veli University	1	1 %		
Ankara Müzik ve Güzel Sanatlar University	1	1 %		
Atatürk University	2	2 %	2	10 %
Aydın Adnan Menderes University	1	1 %		
Bahçeşehir University	4	4 %	1	5 %
Balıkesir University	1	1 %		
Bandırma Onyedi Eylül University	1	1 %		
Bartın University	2	2 %		
Bolu Abant İzzet Baysal University	1	1 %		
Burdur Mehmet Akif University	2	2 %		
Bursa Uludağ University	2	2 %		
Çanakkale Onsekiz Mart University	5	5 %		
Çukurova University	1	1 %		
Dicle University	1	1 %		
Dokuz Eylül University	1	1 %		
Düzce University	2	2 %		
Ege University			1	5 %
Erciyes University			2	10 %
Erzincan Binali Yıldırım University	3	3 %	1	5 %
Eskişehir Osmangazi University	3	3 %		
Fırat University	3	3 %	1	5 %
Gazi University	7	6 %	1	5 %
Gaziantep University	1	1 %		
Gebze Teknik University	1	1 %		
Hacettepe University	2	2 %		
İnönü University	1	1 %		
İstanbul Arel University	1	1 %		
İstanbul Aydın University	3	3 %		

University	Master's N	%	PhD/ Doctor of Arts N	%
İstanbul Okan University	3	3 %		
İstanbul University	1	1 %	2	10 %
İzmir Katip Çelebi University	1	1 %		
Kadir Has University	1	1 %		
Kapadokya University	1	1 %		
Karadeniz Teknik University	1	1 %		
Kastamonu University	1	1 %		
Kırıkkale University	2	2 %		
Kırşehir Ahi Evran University	1	1 %		
Kocaeli University	4	4 %		
Maltepe University			1	5 %
Marmara University	2	2 %	1	5 %
Mersin University	1	1 %	2	10 %
Muğla Sıtkı Koçman University	2	2 %		
Munzur University	1	1 %		
Necmettin Erbakan University	2	2 %		
Niğde Ömer Halis Demir University	2	2 %		
Ondokuz Mayıs University	2	2 %		
Pamukkale University	2	2 %		
Sakarya University	3	3 %	1	5 %
Sakarya Uygulamalı Bilimler University	1	1 %		
Selçuk University			1	5 %
Süleyman Demirel University	2	2 %		
Ufuk University	1	1 %		
Uşak University	1	1 %		
Üsküdar University	3	3 %		
Yıldız Teknik University	1	1 %		
Zonguldak Bülent Ecevit University	2	2 %		
Total	108	100 %	20	100 %

The distribution of PhD dissertations and master's theses among Turkish universities is shown in Table 4. Gazi University was placed first among universities with seven master's theses and one PhD dissertation on the subject of digital literacy, according to the chart. Afyon Kocatepe University, Ağrı İbrahim Çeçen University, Akdeniz University, Ankara Hacı Bayram Veli University, Ankara Müzik ve Güzel Sanatlar University, Aydın Adnan Menderes University, Balıkesir University, Bandırma Onyedi Eylül University, Ege University, Gaziantep University, Gebze Teknik University, İnönü University, İzmir Katip Çelebi University, Kadir Has University, Kapadokya University, Karadeniz Teknik University, Kastamonu University, Kırşehir Ahi Evran University, Maltepe University, Munzur University, Sakarya University.

Table 5. Distribution of theses according to university type

Type of University	*N*	*%*
Public University	110	86 %
Foundation University	18	14 %
Total	128	100 %

Table 5 shows the distribution of theses according to university type. The results clarify that graduate theses on topics related to digital literacy are written at public universities in 86 percent of cases. The percentage of graduate theses on topics related to digital literacy that come from foundation universities is 14 %. The following foundation universities — Üsküdar, Okan, Kadir Has, Kapadokya, Istanbul Arel, Istanbul Aydın, and Bahçeşehir — have been cited in publications regarding digital literacy. Among public universities, Gazi, Amasya, Anadolu, Atatürk Kocaeli,

Sakarya, and Çanakkale Onsekiz Mart universities have emerged as leaders in the field of digital literacy research.

Table 6. Distribution of theses according to area of research

Area of Research	*N*	*%*
Medical Education	1	1 %
Business	9	7 %
Computer and Instructional Technologies Education	16	13 %
Physical Training and Sports	4	3 %
Education Science	15	12 %
Education Technologies	1	1 %
Social Studies Education	3	2 %
Radio Cinema and Television	2	2 %
Health Management	3	2 %
Math and Physical Science	9	7 %
Public Relations and Publicity	4	3 %
Political Science and Public Administration	2	2 %
Nursing	2	2 %
Sculpture	1	1 %
Communication Science	2	2 %
Turkish and Social Science Education	15	12 %
Western Languages and Literature	2	2 %
Public Health Nursing	1	1 %
Basic Training	6	5 %
Music Education	1	1 %
Tourism Management	1	1 %
Science Education	1	1 %
Advertising	1	1 %
Education Programs and Teaching	2	2 %
English Language Education	5	4 %
Child Development	2	2 %
New Media and Communication	2	2 %
New Media and Journalism	1	1 %
Strategy Science	1	1 %
Journalism	5	4 %
Management Information System	1	1 %
Sociology	2	2 %
International Trade and Logistics	1	1 %
Primary Education	1	1 %
Total	128	% 100

The distribution of theses according to the area of research is presented in Table 6. As stated in Table 6, there are 34 different areas of research in total. According to this result, we can say that the topic of digital literacy has sparked interest in a variety of areas of research, from health to communication to education to business. Table 6 indicates that the Department of Computer and Instructional Technologies Education has produced the greatest number of theses on the subject of digital literacy. Otherwise, 13 % of theses focused on computer and instructional technology education, with education science coming in second with 12 % and Turkish and social science education with 12 %. Education Technologies, Sculpture, Public Health Nursing, Music Education, Science Education, Tourism Management, Advertising, New Media and Journalism, Strategy Science, Management Information Systems, International Trade and Logistics, and Primary Education had the fewest number of thesis writers (1 percent).

Table 7. Distribution of theses according to sampling methods for the selection of respondents

Type of Sampling	*N*	*%*
Convenient sampling	19	7 %
Purposive sampling	18	14 %
Simple random sampling	27	20 %
Convenience sampling	38	29 %
Systematic random sampling	5	4 %
Stratified sampling	12	9 %
Quota sampling	4	3 %
Cluster sampling	2	2 %
Not mentioned	7	5 %
Total	132	100 %

According to the statistics in Table 7, convenience sampling ranked highest among the sampling methods used for the selection of respondents, with 29 percent (38 theses). Cluster sampling, at two percent, is the least popular sample strategy in graduate theses on digital literacy issues. Table 7 lists the sampling techniques used in written graduate theses on digital literacy, including probability and non-probability sampling (convenient, purposive, simple random, systematic random, stratified, quota, and cluster). It was discovered that the not-mentioned sampling type makes up 5 % of all graduate theses. Techniques like literature reviews, document analyses, and content analyses are used in theses with a not-mentioned sampling type.

Table 8. Distribution of theses according to the types of respondents

Type of Respondents	*N*	*%*
Secondary and High school students	27	21 %
Teachers	27	21 %
Accounting Member of Profession	1	1 %
Financial Advisor	1	1 %
University students	35	27 %
Adults over 18 ages	1	1 %
Communication specialists	1	1 %
Academicians	7	5 %
Patient/Patient's relatives	2	2 %
Civil registry employees	1	1 %
Z generation	3	2 %
Health managers/employees	1	1 %
Individuals living in Istanbul	2	2 %
Parents	4	3 %
Individuals living in Mersin	1	1 %
University administrative personnel	1	1 %
Civil aviation workers	1	1 %
Associate students	1	1 %
Social media users	1	1 %
Those who live in the Western Mediterranean region	1	1 %
Techno pole workers	1	1 %
Highly trained people	1	1 %
White collar workers	1	1 %
Institute of Forensic Medicine	1	1 %
Literature review	2	2 %
Document analysis	4	3 %
Content analysis	1	1 %
Total	130	100 %

The distribution of theses according to the types of respondents is presented in Table 8. According to Table 8, the majority of respondents were instructors, secondary and high school students, and university students. Combinations of two or more respondents came in second and third. Highly skilled individuals, white-collar workers, administrators at universities, workers in civil aviation, and so forth were the least attentive answers.

5. Conclusion

The study's findings indicate that the problem of digital literacy is becoming more and more important. The most prominent approach is the survey method in graduate theses. It can be observed that the mixed technique, which combines quantitative and qualitative methods, came in second. A total of 128 graduate theses — 108 master's degree theses, 19 PhD dissertations, and 1 doctor of arts – are analyzed in this study. The digital literacy levels of the participants, digital citizenship, digital literacy and lifelong learning, new media literacy, and issues related to the use of information and communication technology were found to be prevalent titles among the graduate theses that were evaluated. It was discovered that in Türkiye, public universities account for 86 % of graduate theses on subjects connected to digital literacy, whereas foundation universities account for 14 %.

Examined theses present a variety of methods and techniques, such as document analysis, content analysis, discourse analysis, and structural equation modelling, that are used in theses and dissertations. The least applied methods were focus group discussion, discourse analysis, multiple situation analysis, and action research. The need for and importance of mixed method in graduate theses has increased year by year, according to the examined graduate theses in the digital literacy area.It has been found that more than one method is used in some graduate theses. According to the findings, both probability and non-probability sampling types are used in theses. The convenience sampling method was the dominant method in graduate theses. Put differently, both probability and non-probability sampling, such as convenient, purposive, simple random, convenience, systematic random, stratified, quota, and cluster sampling, are used in written graduate theses on digital literacy.

It is examined in national and international literature. According to current studies, digital literacy's importance and need for citizen's increase day by day. Moreover, digital literacy skills are associated with the digital divide or the level of development of countries. According to Chetty et al. (Chetty et al., 2018), there are two phases of the digital divide: low- and middle-income nations' expensive, inadequate infrastructure and low levels of digital literacy. Digital access to communication technology is limited in low- and middle-income nations due to high costs, inadequate infrastructure, and a lack of diverse opportunities.

Orakova et al. (Orakova et al., 2024: 4) indicate that digital literacy is a crucial component of learning and education, with digitalized education and digitalization in classrooms and teaching methods. They go on to say that teachers and educators have been impacted by this shift. In this context, we can say that digital literacy and digital literacy studies will become more common in the future. It is known that one of the aims of digital literacy is to enable people to participate in society on equal terms and to decrease the digital gap between different socio-economic groups. Undoubtedly, the examined graduate theses and findings revealed the importance of digital literacy in society, the education system, and all other infrastructure.

Mishra and Sharma (Mishra and Sharma, 2018) explain that in today's digital world, citizens need to succeed and provide sustainability to digital skills like critical thinking, digital literacy, media literacy, technology literacy, information literacy, collaboration, communication, creativity, flexibility, leadership, productivity, initiative, social skills, e-safety, character, and citizenship. As a result, it is seen that digital literacy helps individuals succeed in life, understand others, produce digital content, and communicate with others.

In total, it is seen that it examines 34 distinct scientific fields. This research indicates that digital literacy has generated interest in Turkish foundations and public universities in a wide range of academic domains, including business, education, health, and communication. The bulk of respondents were discovered to be university students, secondary and high school students, and instructors. Stated differently, most of the graduate theses that were analyzed had secondary and high school pupils, teachers, and university students as their intended audience.Highly skilled individuals, white-collar workers, administrators at universities, workers in civil aviation, and so forth were the least attentive answers. Another important finding in this study is that the

communication field constitutes 12 percent (15 theses) of total digital literacy graduate theses. These rates are classified into Journalism 5, New Media and Journalism 1, Public Relations and Publicity 4, Radio Television and Cinema 2, Advertising 1, and New Media and Communication 2. Graduate theses in communication science make up about 12 % of all theses.

When measuring digital literacy, e-literacy, media literacy, or literacy abilities in graduate theses through survey methodologies, the majority of researchers employed the original scale. Each of these features includes enlightening titles, abstracts, and literature evaluations on digital literacy. Except for tables, most theses employed graphic aids to describe and illustrate the subject under investigation and the field of study. Attached were research instruments, questionnaires, forms for semi-structured interviews, forms for collecting personal data, forms for developing scales, and scale forms that were utilized in the majority of theses.

It is observed that education science, computer and instructional technologies, and Turkish and social studies education departments among the investigated graduate theses ranked as prominent. The fact that the main thesis subjects of the theses under examination in this study may be broadly classified into three categories—digital literacy levels, information and communication technology usage and lifelong learning, and information literacy—is also noteworthy. This study contributes to the body of knowledge on digital reading themes, artificial intelligence literacy, data literacy, new media literacy, information and communication technologies, and digital literacy.

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Social Media in Sports Marketing

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Abstract

Social media are playing an increasing role in today's society, and sports industry is not an exclusion. The study explores how exactly social media affect the sports sphere. The analysis shows that several directions of this influence can be underlined. They include an impact on fans/consumers, sport clubs and organizations, players' and athletes' personal brands and sport-related businesses. Social media has changed the way sports content is consumed in many ways. Previously, broadcasts were conducted only on official channels such as television. The study concludes that fan engagement is the key channel that allows clubs and organizations to monetize this attention using several models. Also, the study suggests the ways of enhancing the interaction between sport brands and their fan base.

As clubs and particular players have become brands, fans want to know more about them, and clubs should satisfy this demand. Organizing activities such as charity meetings, autograph sessions, presentations, issuing special video content are other methods for enhancing fan engagement.

Keywords: social media, fan engagement, sport brand, sport marketing, marketing mix.

1. Introduction

Sports has always been an object of public interest. It is interesting to watch sports even for those who do not make sports themselves. The roots of this attractiveness lay deeply in the human psychics as athletes in high-achievement sports act at the peak of their physical and mental abilities while spectators compensate their inability to perform at the same level by supporting and cheering for the athletes (Filo et al., 2015).

Sport has become a global industry with revenues of hundreds of billions of dollars. As of 2023, its revenue was estimated as $512bn, and it is expected to grow at a 5 % rate in the period 2023–2028 annually (BRC, 2023). The main drivers of this growth are expected to be the general economic growth in in both developing and developed regions and unquenchable people's interest to the sphere of entertainment in general and the sports sphere in particular.

The main reason why sports has gained global outreach is the media and internet. Sports competitions were held throughout the entire 20th century, but it was the media, and later the Internet, that made them massive and ensured the interest of the public. Since the competitions are held in a specific location, many people do not have the physical opportunity to attend them, but media coverage allows them to be watched remotely. And while earlier broadcasting was conducted only through official sources and was one-sided, which made it impossible to discuss events on the same sites, then the heyday of social networks allowed for creating networks of communication and multiplied the amount of content created around the events themselves.

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The aim of this article is to disclose how exactly social media affect the development of the sports industry, what channels contribute to it and how this process can be enhanced.

2. Materials and methods

The study is conducted using the analysis and synthesis as main research methods. The theoretical basis of the study is the existing theoretical literature on the topic as well publications in thematic journals and on websites.

Along with that, it is necessary to explain some prerequisites to the topic analysis. First of all, it is necessary to explore how the Internet and media in particular turned into the main instrument of sports promotion. This increase in the influence evolved with the development of the Internet itself.

Oddly enough, the very definition of Web 1.0 came into use after the advent of Web 2.0. The comparison showed that the Internet has become completely different and it was possible to highlight the features and differences of the previous "version". Web 1.0 can be explained by one phrase – “read-only”. That version of the Internet was quite similar to traditional media such as TV or radio as the communication was unilateral. Users only had the opportunity to browse the pages and interact with the content. The Internet has not yet developed the possibilities for users to participate in the creation of content, they only consumed what appeared on web resources. No authorizations, trackers, or registrations existed.

The term Web 2.0 belongs to Tim O’Reilly who issued an article ‘What is Web 2.0’ in 2005 (O’Reilly, 2005). This stage has been lasting nowadays. At this stage, large corporations recognized new great perspectives and opportunities to present themselves, form their image and reach their customers. Along with that, users were given permission to create their own content (UGC, user-generated content) and create their profiles on different websites and platforms. This can be characterized as Read/Write web.

Finally, the emergence of social networks has become as much a breakthrough innovation as the mass Internet itself. Although social networks remain within the framework of the Web 2.0 concept, they have radically changed the interaction in many industries. Not only ordinary users received an opportunity to communicate when they wanted and where they wanted, but also various types of content have become available. Moreover, it soon became clear that social media can be effectively used for running and supporting businesses as they allowed for personalizing information provided to users, gather tons of information about users, their characteristics and preferences, and reach users directly.

Sports industry is not an exclusion. Given long-lasting interest of the audience to sports, it would be a crime not to use social media for popularizing sport content, involving new people into fan clubs and selling more merchandise goods such as sports apparel, shoes, souvenirs among many others (Escamilla-Fajardo et al., 2020).

3. Discussion

The analysis shows that the key function of social media in the context of sports marketing is involvement of fans and customers into interaction with sport brands, be it clubs, athletes or producers of apparel and equipment (Stander, 2016). Social media have changed the marketing mix strategies substantially. Su et al. (Su et al., 2020) suggest that the traditional marketing 4P model has already evolved into the 4S model: Product is replaced by Consumer as it is consumers who decide what to consume, when and by what means. Price is replaced by Cost as customers and fans compare how much the good, be it new experience, impressions, or physical goods, will cost for them and whether they are ready to pay for it. Place is replaced by Convenience as social networks and new technologies allow customers to have almost the same experience from virtual presence and live broadcasts instead of being at the stadium. Finally, Promotion that had been a unilateral message turned into Communication as brands are interested in feedback and reaction of the audience to better tailor their product to consumers’ preferences.

The strategy of involvement is also in line with the model by Fowler and Wilson (Fowler and Wilson, 2016) that has four dimensions: (1) hosting fans even in non-match days; (2) connect the fans beyond the stadium in non-match days; (3) improve and extend spectator experience in match days; (4) give fans opportunities to touch the match live even if they are not at the stadium. The latter three dimensions of involvement can be ensured by using social media. Discussion of matches including user generated content, virtual stadium tours, contests, lotteries and sweepstakes become possible due to social networks.

Engaged fans contribute to development and prosperity of their favorite clubs as clubs' revenue largely depends on cash streams received from the fan base (Wann, James, 2019). Based on data received from the fan base including personal data, preferences, set of preferred activities, frequency of purchases, clubs have an opportunity to personalize their messages and offerings. In the recent years, social media have become the main channel of interaction with customers (Vale, Fernandes, 2018). Being a new phenomenon and an innovation only a decade ago, social media have turned into a must-have tool for collaboration with fans and co-creation of development strategy. Clubs take into account feedback from fans when designing their products and services in order increase value which ultimately will turn into larger revenue streams (Thomas, 2018).

The ways of monetizing social network activities are diverse. Mohammadkazemi (Mohammadkazemi, 2015) suggests 5 main channels of monetizing customer attention:

1) Freemium (free + premium) model that divides all the content into two types – some portion of content is provided for free but if consumers want to get some exclusive content, they have to pay for it.

2) Affiliate model implies that a service generates traffic due to interesting content and redirects customers to sponsors' or partners' websites. A typical example for the sport industry is the partnership between sport news portals and betting organizations.

3) Virtual Goods model is used for around-sport activities including the sale of virtual points, statuses, clothes and other insignia. Also, virtual contests such as forecast contests and fantasy leagues are directed at popularizing sport support.

4) Subscription model requires users to pay fees for a period of access to specific content. NBA League Pass and streaming service subscriptions are examples of this model.

5) Advertising model merely implies placing banners and other ways of mentioning products or services on social media platforms.

4. Results

The analysis shows that social media have a great impact on the way sport marketing activities are currently conducted. At the same time, several directions of this influence can be distinguished. These are the impact of social media on fans, sport teams, particular athletes and players, and on sport brands.

Impact of social media on fans/consumers

Social media has changed the way sports content is consumed in many ways. Previously, broadcasts were conducted only on official channels such as television. This meant that there was a centralized content producer, and the viewer received exactly as much content as the producer intended. At the same time, most of the broadcasts were conducted once, and therefore the user did not have the opportunity to watch them at another time. The Internet has given new opportunities – to see statistics and have constant access to them, discuss the results of sports events remotely, generate your own sports-related content, and conduct your own broadcasts. However, it was social networks that made interaction with other users and direct participants in sports events so simple and convenient that the number of people willing to participate in such interaction began to grow continuously.

Moreover, if at first different channels coexisted and viewers could watch sports broadcasts on TV and then discuss on the Internet, now there is a tendency to replace the "old" broadcasting methods with more modern ones (Figure 1).

This trend will only grow, and the next generations will be increasingly immersed in social networks or interaction formats that will replace them. Moreover, this trend is typical for any content. And it would be strange to expect that younger generations consume content on social networks, and sports broadcasts will be an exception. This is largely due to the change of generations and the rapid development of new technologies. With much more advanced technology at their disposal, young viewers will no longer want to watch broadcasts the way their parents did.

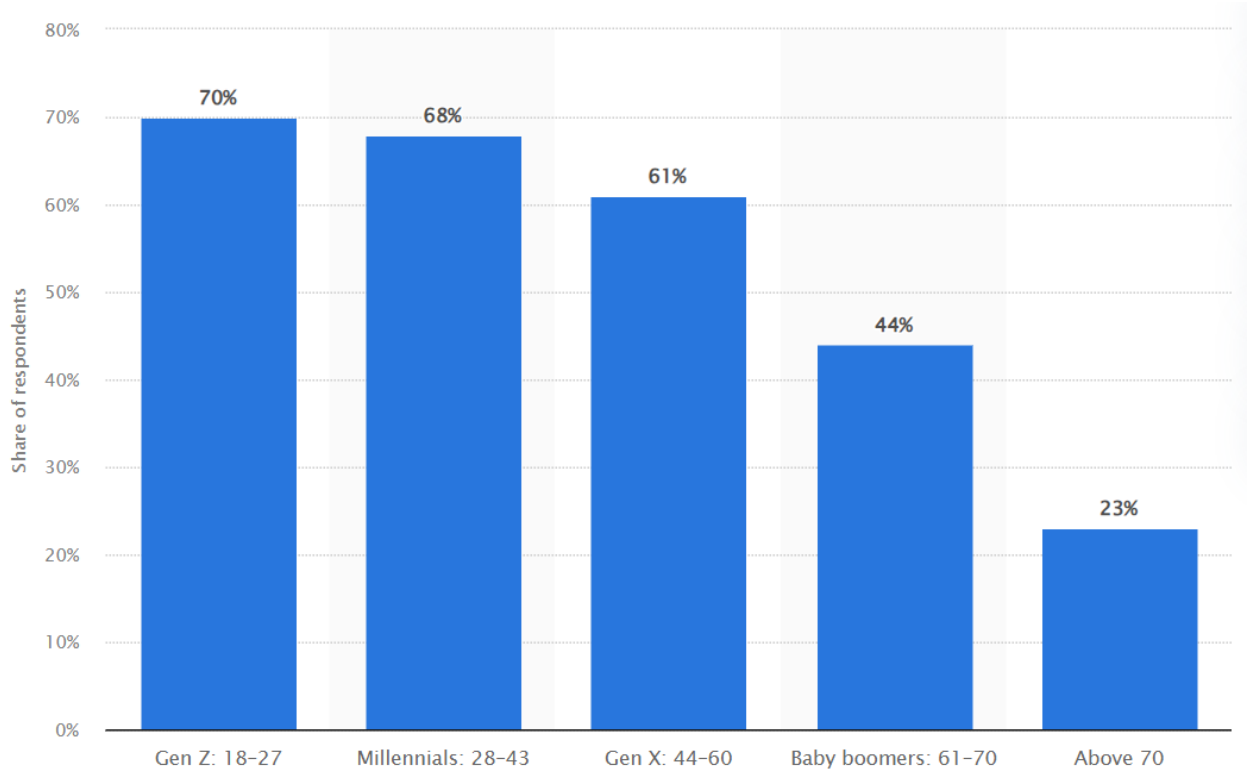

Fig. 1. Share of fans who prefer to watch sports on social media worldwide as of April 2023, by age
Source: Statista, 2023

Impact of social media on teams

Social networks have also become an important development tool for sports clubs, which have realized their commercial potential in time. The Internet and social media have become the key to clubs' access to international markets. If in the pre-Internet era, sports clubs were most often objects of interest to local fans, now the market for large clubs has become global. The European and American markets have been saturated for a long time, and clubs should not expect rapid profit growth here. But the markets of developing countries are a huge growth driver for leading sports teams. In the countries of Asia, Africa, and Latin America, the general standard of living is gradually increasing, people are gaining access to new benefits, which means that the population of these countries is becoming more solvent. Residents of developing countries are ready to spend part of the increased income on entertainment, including the consumption of sports content and the purchase of sports symbols (McCarty et al., 2014).

In order to promote their brands in foreign markets, clubs are becoming more open and producing more and more sports-related content. Separately, it is worth highlighting films for leading streaming services such as Amazon Prime and Netflix – *All or Nothing: Manchester City, Sunderland 'Til I Die', Being: Liverpool, All or Nothing: Brazil National Team, Take Us Home: Leeds United* and many others. They show the inner life of the teams, their training, daily routine, and staff work. In addition, the clubs additionally hold contests on social networks, charity and sponsorship events, shoot short videos about the life of the club, cut the most memorable events, inform fans about important events and remind them of memorable dates. On match days, the clubs work with the spectators at the stadiums, holding additional events and competitions. Here, the standard of work is American professional leagues such as the NBA, NFL, NHL, MLB, MLS. All these activities strongly attract viewers and make them empathize with these teams even more.

The transformation of high-performance sports into a show has become a major trend especially in the 21st century, and social networks have played a special role here. Sports-related content is actively published, and most of it is produced not by the teams, but by the viewers themselves. Thus, the effect of word of mouth is also connected, when interest in such an atmosphere of competition spreads and grows like a snowball.

There is also a kind of competition between the clubs to attract the attention of the fans. It has long been proven that loyal fans are the most profitable customers who bring huge amounts of money

to clubs. Therefore, clubs are looking for ways to increase the degree of fan engagement, to give them more opportunities to participate in the life of the club, which then pays off many times.

The model in which the team and the audience interact only during the competition is outdated. It has been replaced by a more advanced concept, according to which the club's brand and user experience are considered as an object of consumption (Gantz, 2013). Therefore, clubs should maximize the frequency and depth of audience engagement, give them the opportunity to interact with their brand not only during competitions and matches, but almost constantly. And social networks combined with new technologies, including augmented and virtual reality, are an effective tool for implementing a new understanding of the work of sports clubs.

Impact of social media on athletes and players

The era of personal brand development began before social networks appeared. You can recall Michael Jordan, who signed a "shoe" contract with the then little-known Nike company. As a result, the company gradually turned into a world leader in the sportswear industry, and Jordan himself became a billionaire not so much due to the money earned by basketball, but thanks to the creation of a personal sub-brand under the wing of Nike and a lifetime contract with the company.

However, it was social networks that made possible a giant leap in the salaries of top athletes, the massive development of personal brands, but at the same time the strategy of athletes' behavior in the public field. If earlier information about how athletes spend their time outside of competitions was extremely scarce, then with the advent of social networks it became known about almost every step they took. It has become extremely difficult for athletes to hide from prying eyes – everywhere you can find a camera pointing at you with a desire to photograph a celebrity. On the one hand, athletes began to complain about the consequences of total publicity, such as panic attacks and multiplied stress. But on the other hand, with competent PR work, athletes have the opportunity to become much more recognizable, and therefore receive much higher fees outside sports grounds. The personality of the athlete has become a personal brand, and now, when moving from one club to another, in addition to age and potential achievements, the transfer amount necessarily takes into account the marketing potential.

Many viewers, especially in cities that are not spoiled by a large number of stars, go not so much to the competition itself or the match, but rather to see a particular athlete. It would not be a big exaggeration to say that it is the stars that assemble stadiums, and it is the stars that are the main assets of the teams. Sometimes this leads to excesses when a star player begins to dictate his terms to the club – to lobby or directly approve the appointment of a coach he likes, to force the club to transfer the right players, to set additional conditions. For example, the NBA is already directly called the "league of stars", meaning that coaches and even owners of many, especially clubs not from large media markets such as Los Angeles or New York, having got a star in the draft, will make any sacrifices just to keep it. How are social networks involved in this? Sometimes a single tweet or hint on Instagram is enough to encourage the team to make serious changes in the composition or coaching staff.

It is no coincidence that perhaps two of the most famous athletes of our time – Lionel Messi and Cristiano Ronaldo – are competing not only on the football field, but also on social networks (Figure 2).

Although this rivalry is virtual, and the football careers of both are coming to an end, their global popularity does not blur. Facebook's list of the top 10 accounts with the largest number of subscribersat least includes companies and organizations such as Samsung, Real Madrid (football, again) and CGTN, Instagram's similar list consists of only world-famous show business stars who are side by side with these two players. Moreover, only these two players are present in the ratings of both social networks. This may indicate that they themselves have turned into stars not only of football, but show business stars. And social networks played one of the main roles in this evolution.

Without social networks that reflect every step of football players, there would not be this global popularity. Michael Jordan is almost unanimously recognized as the greatest basketball player in history, but his popularity still practically does not go beyond the circle of basketball fans. It remains to be seen how far his popularity would have gone if he had lived in the era of social networks.

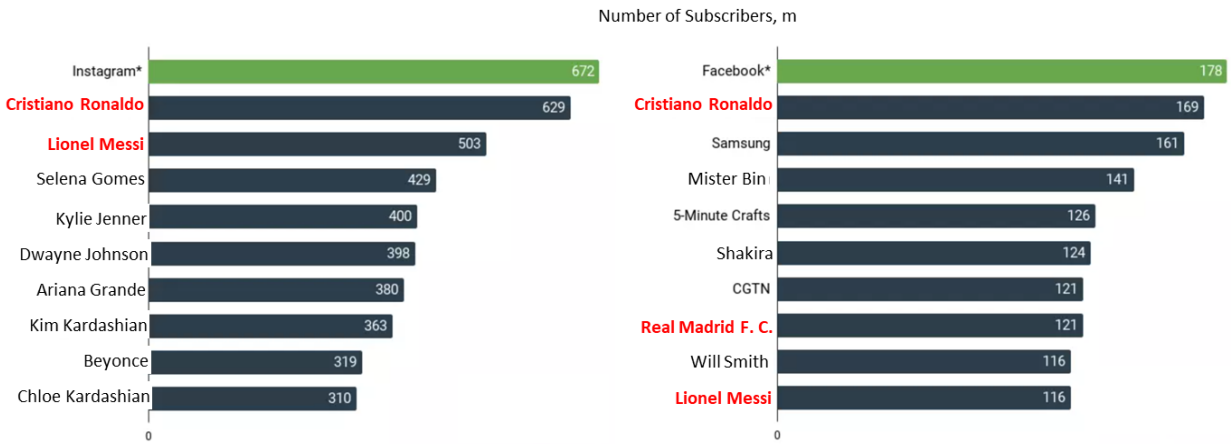

Fig. 2. Top 10 accounts by the number of subscribers in Instagram and Facebook
Source: Social blade, 2024

Impact of social media on sport brands

Finally, the sports industry as a whole should not be ignored as its popularity would be impossible without the popularity of clubs and individual athletes. Nike, Adidas, Gatorade and many others are strongly associated with elite-level sports. It can even be said that the most popular sports competitions are, on the one hand, a showcase of achievements in sports technology, and on the other hand, a field of competition not only for athletes, but also for the brands they represent.

The task of such companies is to create a dense associative link between the achievements of athletes and clubs and the equipment in which they perform. At the same time, athletes become brand ambassadors, sign advertising contracts under which they appear in public, perform and advertise specific brands on personal social media accounts.

5. Conclusion

The main conclusion that can be made from the article is that social media have become one of the main channels of communication between sport brands including clubs, athletes and players, and producers of sport-related goods. It is social media that increase the scope of information and impressions that spectators and sport fans receive. This, in turn, helps to raise the level of customer involvement that stems into revenue streams for sport organizations.

Social media marketing is here to stay. The content of marketing mix has changed significantly over decades. Digitalization and virtualization are common trends in the sports industry. It is not sufficient for fans to be at the stadium during the match. Pre-match and post-match entertainment, non-matchday activities, virtual services have great potential of monetizing, therefore sport organizations should account for them in order to be financially sustainable.

To enhance this communication, should further extent the density and deepness of contact with existing and potential customers. This can be done in different ways. Providing more information around the sport is one of them. As clubs and particular players have become brands, fans want to know more about them, and clubs should satisfy this demand. Organizing activities such as charity meetings, autograph sessions, presentations, issuing special video content are other methods for enhancing fan engagement. Although a lot has already been done on the way of integrating social media into marketing mix, this channel still has a great potential which has yet to be implemented.

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Media Literacy Ecosystem Model for Senior High Schools in Indonesia

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Abstract

This article explains how the media literacay ecosystem should be run in Indonesia high schools. Based on the 2022 PISA report, the levels of mathematics, reading, and science are quite low. Seeing this fact, the Ministry of Education and Culture created the School Literacy Movement (GLS) program, which aims to increase the literacy level of school students. The journey of the GLS program itself is different for each school, including its challenges and potential. In the current situation, it is necessary to apply new approaches, techniques, and methods to the education system at different levels in order to develop students 21st century skills that are in demand in a modern technological environment. Therefore, we researched how GLS was implemented at SMAN 106 Jakarta and SMA GAMA Yogyakarta. The reason we chose these two high schools is that Jakarta and Yogyakarta are areas with good literacy levels. After we conducted a focus group discussion (FGD) with the school, we discovered a number of challenges and potential for implementing GLS from these two schools to other schools. Based on the results of the discussion, we created a literacy development model in schools to become an alternative reference for other schools.

Keywords: literacy model, school literacy movement (GLS), Indonesia literacy, 21st century skills, education, high school.

1. Introduction

Globalization, technological change, internet speed, changes in reading culture and school organization, supply and demand for higher levels of literacy skills in the information age (Muqsith, 2019; Muqsith et al., 2021; Muqsith, 2022; Muzykant et al., 2022; Muzykant et al., 2023). Literacy is very important for students in education, especially as a set of skills needed to find, retrieve, retrieve, analyze, and use information to make decisions and solve problems (Ranaweera, 2008). The module book entitled School Literacy Movement (GLS) for Senior High Schools (SMA), issued by the Ministry of Education and Culture of the Republic of Indonesia (Kemandikbud RI) in 2020, literacy develops into multiliteracy skills. Abidin (Abidin, 2016) defines it as using various methods to combine and understand ideas and information using conventional text forms and innovative text forms, symbols, and multimedia. The text used is called multimodal text.

These skills are expected to achieve learning outcomes, including aspects of students' attitudes and knowledge in culture, citizenship, finance, digital, and science. The mention of various types of literacy emphasizes the importance of mastering various literacy skills. Frankel et

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al. (Frankel et al., 2016) state the use of reading, writing, and spoken language to extract, construct, integrate, and criticize meaning through interaction and engagement with multimodal texts in social situation practice. The definition above provides a more functional perspective on previous literacy. Literacy is about action: how a person uses reading, writing, and language skills to form meaning through social interaction and engagement. This definition complements what is expressed by the GLS. If we integrate it, literacy is how we utilize financial, digital, cultural, civic, and scientific knowledge to benefit society and create meaning. In other words, literacy is our ability to process and interpret things.

We cannot escape from the PISA indicator when discussing literacy in Indonesia. In the 2022 PISA report, Indonesia's position is still below the OECD standards: mathematics (355), reading (359), and science (383). This shows that Indonesia is still lagging in fundamental literacy. The low reading culture of Indonesian society also supports this. Literacy skills play an important role in processing incoming information in social life. Good literacy skills enable us to understand many things. In an economic context, good literacy skills make us get better jobs. On the contrary, their inability to read and write can prevent them from seeing what they are entitled to and demand for themselves (Zua, 2021).

In Indonesia, the literacy ecosystem is not well formed. There are two indicators that we can assess. The first indicator is based on the data that has been attached; two aspects trigger the low number of Indonesians who have an interest in reading. First, Indonesian people have limited access to reading. According to school library data from the national library, the ratio of the availability of new school libraries to the total required is 50 % (P3KMB, 2016). This means that there are still many schools that do not have libraries in their schools.

The second factor is the preferences of activities carried out by the community. In the current era, Indonesian people prefer surfing the internet. According to We Are Social data for 2023, the average Indonesian spends 7 hours and 42 minutes surfing the internet. Meanwhile, Indonesians spend 1 hour 37 minutes reading books (Adisty, 2022). Other research suggests that 68% of students read 1-2 hours a day. Meanwhile, 4 % of students read for 2 hours daily, and the remaining 14 % read books for 30-60 minutes. This means that Indonesians prefer to spend their time surfing the internet rather than reading books.

Seeing this phenomenon, the Ministry of Education and Culture elaborated the School Literacy Movement (GLS), which involves all stakeholders in the education sector from the central, regional, district/city, and educational units. GLS aims to optimize student character by cultivating the school literacy ecosystem. The stages of literacy activities in the GLS Senior High School (SMA) Guidebook are divided into three, namely, habituation, development, and learning.

The GLS program has been implemented in many schools with varying results. Simabur's research (2022) examined the implementation of GLS in SMA Negeri 1 and SMA Negeri 3 in Tidore Islands. There are differences between SMA Negeri 1 and SMA Negeri 3. In SMA Negeri 3, they have only reached the habituation stage and have not yet realized it until the development and learning stage. Another thing happened at SMA Negeri 1, where they had implemented these three stages. The reason for this difference is that SMA Negeri 1 is supported by the commitment of teachers and principals and the formation of a school literacy team. Meanwhile, SMA Negeri 3 does not yet have a school literacy team, and teacher commitment is low (Simabur, 2022).

Several other high schools also experienced this incident at SMA Negeri 3. Maribun and Tambunan (Maribun, Tambunan, 2022) researched the implementation of GLS at SMA PGRI Ge'tengan. They have not fully implemented the GLS optimally because the availability of facilities in the library room is still inadequate. Pradana et al. (Pradana et al., 2017) found something interesting when researching SMAN Negeri 4 Magelang. Literacy habits have not been fully formed because there is still a dichotomy between students with good reading and writing habits and those with low reading and writing habits (Gorbatkova, Bayer, 2023). This difference hampered the GLS because only some responded well to this movement.

Taking into account that the cultivation of literacy in high schools has not been optimal, the researchers took the initiative to study the literacy ecosystem model referring to the GLS program guidelines at SMAN 106 Jakarta and SMAS GAMA Depok Yogyakarta because the Jakarta and Yogyakarta areas have the highest Community Literacy Development Index scores in 2022 (Puslitjakdikbud, 2019). It is hoped that the results of this research can become a reference for high schools in other areas so that they can apply this ecosystem model to improve their students' literacy skills.

2. Materials and methods

This research uses a qualitative research approach using an exploratory approach carried out on school officials starting from the principal, deputy principal, student affairs, teachers, student organizations at school, and those in charge of literacy, for example. According to Sugiyono (Sugiyono, 2011), qualitative research is research used to examine the condition of natural objects, where the researcher is the key instrument. The difference with quantitative research is that this research starts from data, utilizes existing theory as explanatory material, and ends with a theory. According to Bungin (Bungin, 2003), an integrative and more conceptual analysis method is for finding, identifying, processing, and analyzing documents to understand their meaning, significance, and relevance. According to Bungin (Bungin, 2003), Moleong (Moleong, 2008), qualitative research is research that intends to understand the phenomenon of what is experienced by research subjects, for example, behavior, perception, motivation, and action, holistically and by means of descriptions in the form of words and language, in a special natural context and by utilizing various natural methods.

According to Saryono (Saryono, 2010), qualitative research is research that is used to investigate, discover, describe, and explain the qualities or features of social influence that cannot be explained, measured, or described through a quantitative approach. According to Sugiyono (Saryono, 2011), the qualitative research method is a research method based on post-positivism philosophy, used to research the natural conditions of GAMA Yogyakarta High School and 106N High School in Jakarta, (as opposed to experimentation) where the researcher is the key instrument, data source sampling was carried out purposively and snowball, the collection technique was triangulation (combination), data analysis was inductive or qualitative, and qualitative research results emphasized meaning rather than generalization.

3. Discussion

Dynamics of the Literacy Ecosystem in Jakarta and Yogyakarta

Every school struggles to increase the literacy level of its students. The aim is for students to understand reality and respond to situations based on their knowledge and experience. Different aspects of learning process through media technologies described in several research (Kabha, 2019; Mason et al., 2018; Müller, Denner, 2019; Reid, Norris, 2016; Shen et al., 2019; Wilson, 2019) as well as the most optimal media technologies for distant learning analyzed by F. Macqilchris, H. Allert, A. Bruching (Macqilchrist et al., 2020), news literacy and social media behavior studied by in information society studied by E.K. Vraga E.K., M. Tully (Vraga, Tully, 2021), teachers' English language training described in details by researchers H. Crompton, D. Burke, K. Jordan, S.W.G. Wilson (Crompton et al., 2021; Lomicka, 2020), English as a Foreign Language (EFL) in education is studied by B.E. Siddig (Siddig, 2020) proving that media education enhancing acquired new knowledge while interactive media produce better memory for specific events (Anderson, 2020).

Innovative forms of media education considered by the foreign (Barrot, 2021) and Russian scholars (Egorov, 1986; Fedorov et al., 2019; Fedorov, Levitskaya, 2015; Guruleva, 2018). The benefits of online education in times of crisis studied by C. Damşa, M. Langford, D. Uehara, R. Scherer (Damşa et al., 2021). Research shows that there are several benefits of increasing literacy for students: 1) literacy can be used to eradicate poverty and broaden participation in society; 2) can easily access information to improve education, health, and safety; and 3) more likely to know their rights and can effectively use their rights to defend themselves (Zua, 2021). Every school is competing to create innovative programs so that students' literacy increases.

In the context of SMAN 106 Jakarta and SMA GAMA Yogyakarta, they are trying to create an adequate literacy ecosystem for their students. SMAN 106 and SMA GAMA have their ways of developing students' interest in literacy. For example, SMAN 106 has implemented literacy programs such as digital literacy, expression celebrations, literacy stages, and the application of literacy in teaching and learning activities (KBM). Meanwhile, SMA GAMA focuses on implementing it in teaching and learning activities and giving awards.

If you look closely, there are different patterns. SMAN 106 focuses on developing interests and talents as well as creativity. We can see from the aim of the program itself. The literacy stage, for example, aims to explore children's creativity by displaying various ideas in the school canteen. Then, there is the literacy corner, which aims to increase students' creativity by designing the class so that there is a literacy corner. There is also a wall magazine to display students' work. SMAN 106

trains students' digital literacy by getting them used to QRIS and Google Forms. The school also collaborates with subject teachers to conduct library teaching and learning activities.

GAMA High School requires book reviews after students read a book they like. The school has a 15-minute reading program aimed at high school students. GAMA also encourages its students to visit the library. The school will give awards to students who visit the library the most. Apart from that, the school incorporates the use of literacy in subjects. For example, in Mathematics subjects, students are accustomed to reading and studying the material before the class learning session begins. The questions presented in Mathematics are HOT (high-order thinking); the questions are shaped like stories from everyday life and are fully contextual (according to PISA standards). Analysis of students answering questions becomes more of an assessment by the school.

From these two high schools, we can see quite striking differences. SMAN 106 has an adequate ecosystem because it seeks to integrate fundamental (reading habit) and practical (literacy corner, literacy celebrations) literacy to increase creativity. On the other hand, GAMA High School greatly emphasizes fundamental literacy, such as reading and writing. This activity was intensified by encouraging children to visit the library and a 15-minute reading program. GAMA High School hones students' analytical and critical thinking skills.

Another striking difference is in the aspect of digital literacy. SMAN 106 promotes digital literacy among its students. Digital literacy implemented at SMAN 106 Jakarta is in the form of the provision of artificial intelligence (ChatGPT) and a code of ethics in utilizing IT to foster students' sense of wisdom. The program is also carried out in the form of reading habits (non-textbooks and non-holy books) within 15 minutes; then a resume is made. Collecting student resume results maximizes the use of Google Forms, WhatsApp, and QRIS.

Therefore, the ecosystem between SMA GAMA and SMAN 106 can be different. However, what needs to be emphasized is that the difference here is not a challenge. The school has tried to develop students' creativity, analytical skills, digital literacy, and critical thinking. All of these abilities are very important abilities in the 21st century. Research shows that there is a relationship between critical thinking and creativity, where: 1) there is a significant correlation between critical thinking skills and creative thinking skills on cognitive learning outcomes, (2) the contribution of critical thinking skills and creative thinking skills simultaneously to cognitive learning outcomes amounting to 72.80 % (Siburian et al., 2019).

Overall, what these two high schools have done is of great benefit. For example, Handayani (2018) found that excitement of expression influences courage in expression, talent development, and increasing students' skills and interests (speaking, reading, and writing). Meanwhile, Anjelica et al.(Anjelica et al., 2023) revealed that extracurricular performances can expand and enrich students' abilities and knowledge. Nurfadhilah et al. (Nurfadhilah et al., 2023) explained that the implementation of a scientific approach to learning, especially Physics, was able to increase students' scientific literacy.

Challenges of Building a Literacy Culture

SMAN 106 Jakarta and SMAS Gama have challenges building a literacy culture that refers to the GLS program manual. There are three sources of challenges related to GLS, starting from schools, government, and students.

The challenges from a school perspective are related to budget and competency. Regarding budget challenges, this is experienced by SMA GAMA, especially in providing books. The Principal of GAMA High School expressed this when he wanted to provide proper books for his students:

...."From the government, but we have quotas, for example, percentages; for example, the allocation for libraries is tens of percent. How much later, I'll bring it. I went to the bookstore and chose it myself, choosing books that I felt were suitable for school children. Not much. I've only purchased it twice, and usually, for example, in an English novel, the price is higher. So, the obstacle, yes, is (the budget)."

In this context, books are facilities and infrastructure that must be met if the government wants to improve student literacy. And when we talk about budgets, this problem continually arises, even in A-accredited schools. A-accredited schools themselves also experience funding problems. The research found at least six problems related to financing to achieve National Education Standards: 1) the operational cost burden if it only complies with the provisions will make it difficult to innovate; 2) the addition of classrooms and laboratories on the 2nd floor requires support from educational development donations (SPP) due to government assistance only for one floor, 3) there is always a shortage of operational costs, 4) there are non-personal

operational costs that the existing budget cannot possibly cover, 5) there is a lack of synchronization in the use of the school budget with the technical guidelines for budget allocation from the APBD and BOS, and 6) the burden is not yet sufficient large non-personal costs due to limited school financial resources, both from the Indonesian State Revenue and Expenditure Budget (*APBN/APBD*) and the community (Yuliana, Raharjo, 2019). Merangin 4 High School could also not provide practical equipment due to budget constraints (Basri et al., 2021).

As a result, budget limitations narrow the space for school innovation in program creation. It can be said from the principal's explanation that the GAMA SMA budget is quite limited, so they optimize existing resources. The role of the budget is important so that schools can carry out innovative programs to increase the capacity of their students. Moreover, Indonesians expect a lot and trust schools to educate their children. Even though education is a shared responsibility, schools still play a central role in developing quality humans.

Another challenge is competency, especially in terms of increasing digital literacy. SMAN 106 does have a digital literacy program, especially ChatGPT. The program is not optimal because teacher capabilities have not increased to an adequate level. Amin Supriyono, one of the teachers at SMAN 106, said:

"So, when we collect works created by students in a drive, say. So, later, the team will determine which works should be checked, but until now, we haven't been able to do that. Work towards getting there gradually while getting there like that. "Just to see the work's validity, genuineness, or originality, it seems like we still need to learn a lot, too."

Currently, digital literacy has become an important skill in this era. Students have also been exposed to developing technologies. Digital literacy itself has meaning as a set of skills, knowledge, understanding, and awareness that can enable a person to be critical, creative, productive, responsible, and safe in using information and communication technology. And the internet and being present in the digital world according to the context of certain needs and/or environments (Nugraha, 2022). High schools play an important role in following rapid technological developments because they are responsible for forming a young generation who can face the challenges of a world increasingly digitalized and connected to various aspects (Kurniawan, Sarah, 2023). Therefore, teachers must have the capability to teach fundamentals regarding how to have an appropriate technological culture.

Apart from competency, another challenge is that a solid literacy team has not been formed. This is what GAMA SMA experienced. The principal of GAMA High School said:

"So, read 15 minutes before learning activities start, but there is no literacy team at school yet. We don't yet have a new literacy activity team limited to doing what the government calls for. "So, if there are any forms of literacy activities, we already know there are several things we can do, but what we are implementing is something we can do at school."

The unwillingness of a solid literacy team could be related to the teaching hours of high school teachers. This was mentioned by Hari Setiawan, one of the teachers at SMAN 106:

"...It is possible that in the future, we can be structured in our assessments because, again, we said earlier that we are stuck with subjects we don't understand except for the Indonesian language teacher. HR. Then we are also faced with 24 hours of teaching; even now, there are 35 hours. So, there's a bit less time to correct it."

The context, Mr. Hari said, is whether there are teachers who correct children's writing using ChatGPT. However, this is also the reality in high school. The large burden of teachers teaching students makes it difficult for teachers to focus on other activities. At MAN 2 Palu City, teachers have a dual role as teachers, homeroom teachers, and supervisors. The fairly high workload has reduced opportunities for some teachers at MAN 2 Palu City to prepare teaching materials, methods, and media for teaching (Jalil, 2020).

The challenges above reflect stakeholders' need to reformulate teacher workload and performance. Moreover, teachers have a vital role in increasing literacy in schools. When teachers have a workload that is too high, it will make it difficult for them to concentrate on more essential tasks, such as teaching and improving their students' literacy capabilities. In the end, a high workload will reduce teacher efficiency and teaching effectiveness, leading to increased stress. Teacher stress can only be reduced if everyone involved in the educational process knows the difficulties faced and tries to relieve some pressure on teachers (Clement, 2017).

4. Results

Strategic Steps to Create Literacy

Seeing the challenges above, several strategic steps need to be taken so that GLS fulfills its function as a literacy development program in schools. The key to developing literacy in schools lies in the teachers in each school. Teachers play an important role in increasing students' cognitive, affective, and emotional capacity.

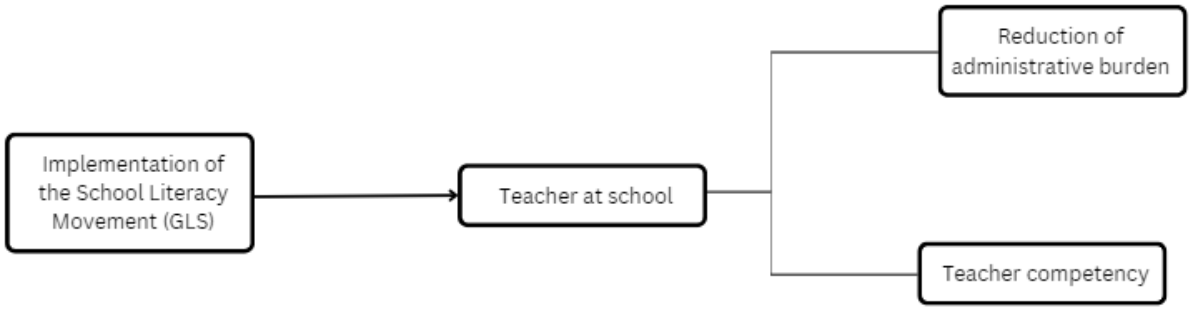

Fig 1. Implementation of the School Literacy Movement (GLS)
Source: Research team, 2023

Therefore, before creating various literacy programs in schools, what must be done is to strengthen the role of teachers. Overall, the role of teachers is important to the effectiveness of the school itself. When it is recognized that building effective schools is a difficult process, teachers are expected to be involved and perform at a high level to overcome these challenges and achieve the school's basic objectives at the desired level (Özgenel, 2019). With such a large role for teachers, we need to redefine the role of teachers as educators of the future generation. Rust (Rust, 2019) defines well what the role of teachers in schools, especially high schools, should be:

"Teacher educators then become not only those whom teachers encounter formally in their preservice programs – professors, mentors, cooperating teachers – but also their colleagues in preparation and then later in their workplaces and the whole apparatus of professional development that is proffered by schools, schools districts, and universities post graduation from preservice education."

This means that the teacher's position is not only as a formal teacher but also positions himself as a partner: a partner in learning, a discussion partner, and a partner in the development process. With the massive development of technology, the role of the teacher has changed to become a facilitator. Becoming a facilitator is not easy, and three keys must be mastered: (1) encouraging participation in discussions, (2) creating or adapting protocols for discussions, and (3) diagnosing emerging problems within discussions (Allen, 2016). Teachers do not have to be confined by traditional dogma, making teachers the knowledge source.

So that the role of teachers becomes stronger in building students' literacy capacity, the first thing that can be done is to reduce the administrative burden and working hours of teachers. This is important so teachers can focus their energy on developing their capacity. Research shows that excessive workload causes teacher stress and burnout, which affects teacher performance (Jomuad et al., 2021). Teachers with greater administrative workloads are less likely to spend time on instructional preparation and providing feedback on students' assignments (Kim, 2019).

Therefore, teachers' workload must be reduced to maximize GLS implementation. We can see for ourselves Indonesia's low PISA score. GLS can be a good program for increasing students' literacy capacity if teachers focus some of their energy on their students. Likely, GLS will not be effective if teachers do everything at once: teaching, administration, holding office, and implementing GLS. There must be a trade-off so everything runs optimally – or at least at the optimal point.

The next thing that must be done is to increase teacher competence. Teachers have to improve their competence because, day by day, the world is becoming more complex, science is increasingly developing, and the characters of students are becoming more diverse. This competency increase aims to ensure that teachers continue to update the latest knowledge useful

for teaching, serving, and running the GLS program. We can learn from SMAN 106, which has difficulty increasing the digital literacy of its students due to a lack of competence.

Research shows the competencies that teachers must master. At a macro level, there are six competencies that teachers need to have: (i) lifelong learning; (ii) multi-literateness; (iii) trans-disciplinarity; (iv) self-agency; (v) interacting with others; and (vi) interacting in and with the world (Marope, 2018). Other mandatory competencies are mastery of technology and information, critical thinking and strategic thinking. Teachers have great opportunities and competencies to diversify their teaching methods, and at the same time, the presence of technology helps create a more interactive and meaningful teaching environment (Sulaiman, Ismail, 2020).

At the same time as reducing workload and increasing competence, schools need to create comprehensive literacy development programs for their students. This literacy development program certainly needs to focus on creativity, critical thinking and analytical thinking. Look at picture 2 of the ideals of the New Model of the School Literacy Movement (GLS) in Indonesia.

Schools can do three things to improve literacy: fundamental literacy, interest and creativity, and student habituation. Fundamental literacy is the literacy that is needed in life. There are three literacies that, according to the author, are fundamental: digital, financial, and scientific.

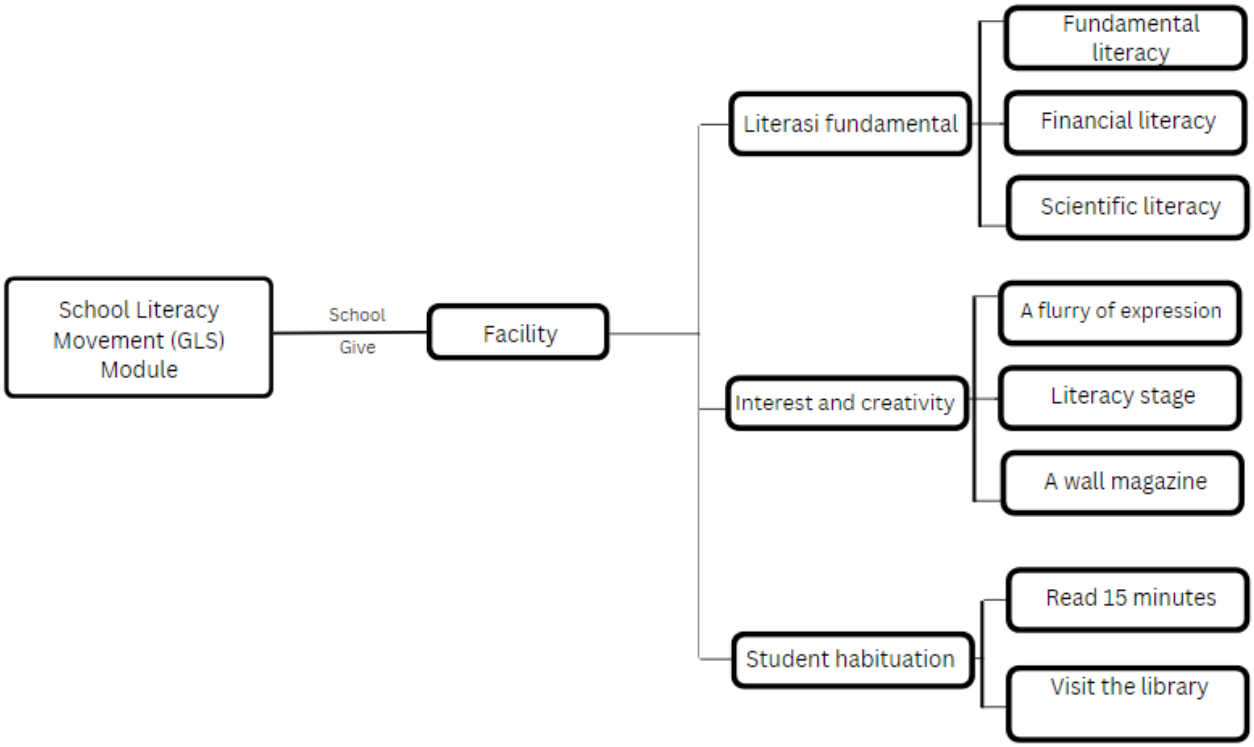

Fig 2. School Literacy Movement (GLS) New Module
Source: Research team, 2023

In the context of financial literacy, SMAN 106 has made efforts to increase its financial literacy. Abdul Rahman explains it as follows:

"For finance itself, there are many economic articles, including BPS. The BPS infographic is very interesting for testing literacy."

Financial literacy is important, especially for navigating life. Many young people only learn financial literacy when they finish higher education. As a result, this ability is important for equipping students in the future. In fact, in Germany, a study measuring the financial literacy of 10th-grade high school students found that German high school students share the general lack of financial knowledge that has been found across various samples (Erner et al., 2016). In India, despite having a high level of numeracy skills, students cannot transfer this knowledge to perform financial calculations (Jayaraman, Jambunathan, 2018). Therefore, financial literacy is very important for future students.

Then, we talk about digital literacy. Currently, young people are considered digital natives. They are exposed to social media, use cell phones to access knowledge, etc. However, in research

on high school students in Lampung province, digital literacy has not been achieved optimally, and student's ability to collaborate is influenced by students' lack of effort in using the internet as a learning resource and the lack of student-centered learning (Purnamasari et al., 2021). This reflects that schools must improve their students' digital literacy skills.

Lastly is scientific literacy. This was included because the PISA science scores were below average. We need to improve this so that students understand the scientific approach. Moreover, scientific literacy is the ability to use scientific knowledge, such as identifying problems and conclusions based on evidence, to understand and make decisions about nature and its changes through human activities (Ardiyanti et al., 2019).

Schools can use various methods to enhance students fundamental literacies. One of them is gamification. This gamification is intended to insert game features into classroom learning. This can be done by providing levels to the questions, a value point system, and rewards for students who are active while learning begins. This activity can be done every day during class hours.

Apart from fundamental literacy, schools must provide as much space as possible for developing students' interests and creativity. Programs like expression shows, literacy stages, and wall magazines can be continued or modified according to the school's capabilities and resources. Reflecting on SMAN 106's experience regarding one of the programs, namely the literacy festival, the teacher said:

"Literacy celebrations are usually at certain moments in the field. All generations. Mrs. Fausan's Language Month is also the same as Language Month. "That's why there are now 12+1 months, plus one more is the Language Month apart from January, February, March."

"Literacy Stage, which is held every two weeks. "This rotation per class is carried out in the school cafeteria during break time."

Implementing the literacy festival and literacy stage can be an example of what SMAN 106 does. Schools can adapt this program according to their conditions. In essence, schools must provide literacy programs that stimulate creativity. Every student is creative. Understanding how highly creative students are creative to varying degrees, depending on how environments support or inhibit creativity, has practical implications for students, teachers, school administrators, teacher education, and educational policy regarding how we can foster creative engagement and the development of creative intelligence in schools (Lassig, 2021).

Lastly is student habituation. This habit is more about how to encourage students to read more. The principal of GAMA High School said:

"There has been an appeal that 15 minutes before learning starts, there will be literacy activities. We have started this since the implementation of the K13 curriculum, but its implementation is only a formality. Children read for 15 minutes (then) make a review."

What GAMA SMA is doing is indeed good. Research shows a significant correlation between critical thinking skills, critical reading skills, and reading comprehension (Hidayati et al., 2020). Not only do students need to get used to reading, but teachers also need to get used to reading so that students can develop an awareness of enjoyable reading. Reading activities can be accompanied by discussions so that both students and teachers can exchange information from the results of reading. You need a reading schedule for every type of book, not only textbooks but fiction and nonfiction books. The variety of books read by students can enrich students' insights and perspectives. Therefore, schools must continue to familiarize their students with reading various books. As a result, when students get used to it, the initiative will be formed for students to read books independently .

The library can also be a place to study. Students should be accustomed to visiting the library. The library is not only a place to borrow books but also to discuss things. Schools must make the library a place for student discussions (Lebid et al., 2023). So students can develop critical and analytical thinking skills and coherently convey information.

With effective, creative, innovative, and progressive strategic steps, it can stimulate students' interest in reading and increase literacy rates in high school. Schools should implement a GLS program, which is interpreted as awareness, not obligation, so that students do not feel burdened. Increasing literacy requires optimal and continuous collaboration from every stakeholder in order to build a culture of literacy in society. The strategic steps implemented at SMAN 106 Jakarta and SMA Gama are expected to be a bridge to the success of Indonesia's educational ideals.

5. Conclusion

Implementation of the High School Literacy Movement (GLS) in Indonesia as an effort to carry out the mandate of the 1945 Constitution (UUD) article 31 paragraph 3 and Minister of Education and Culture Regulation (Permendikbud) No. 23 of 2015 for the government to strive for and implement a national education system that increases faith and piety as well as noble morals in order to educate the life of the nation, one of which is through implementing the GLS program to influence literacy activities in the information era to understand multiliterate texts, namely Proficiency, Access, Alternatives, Culture as an effort towards a reading culture society. State Senior High School (SMAN) 106 Jakarta was used as the research object because it was one of the two regions with the highest Literacy Index in 2019, first and second place in Indonesia, 58.16 and 56.20. This research found that despite the highest literacy index, there are still many shortcomings in improving the literacy reading culture in schools. The entire academic community at school must work together, especially teachers and administrators.

Work as a teacher that requires too much administration must be reduced, and teachers committed to improving student literacy every year should be appreciated. Energy for developing literacy programs can be the focus of schools, not just limited to implementing government programs. On the other hand, schools should prepare school literacy program strategies that are creative, innovative, and progressive in responding to current developments. Collaboration with students and parents is also important in cultivating reading books; students are encouraged to read at school and at home. Various creative programs to improve literacy skills can be used in the framework that the author describes, which can become a reference for literacy development in each school based on the situation and conditions in the school so that a literacy goal is achieved so that first enlightenment, enrichment and finally empowerment can be achieved to become a developed country.

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Factors That Explain Social Network Addiction in College Students

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Abstract

The objective of the present study is to evaluate the factors which explain university students' addiction to social networks as well as to determine and validate the underlying structure that explains this addiction. The design of the study is non-experimental and transversal. This was an empirical study of the descriptive hypothetical-deductive paradigm type, both exploratory and confirmatory. Our population is made up of public university students in Sonora, Mexico. Our sample is non-probabilistic by self-determination. It consists of 356 students (128 women and 228 men). The scale used was a questionnaire on the addiction to social networks (ARS) designed by Escurra and Salas (2014). A model of four factors with twelve items was obtained. The factors are obsessions with social networks (3 items), excessive time spent on social networks (3 items, neglect of social and school activities (4 items), and the need for being connected (2 items). With the results we can understand the dimensions of the scale used in this study, varying depending on the population studied. Thus, the factorial solution obtained in the exploratory analysis yields different structures which can be confirmed using SEM methodology. These may vary in the explanation of addiction to social networks, depending on the context and the population. It is important to continue using these kinds of studies in other scenarios of the private educational sector, in rural areas, with indigenous populations and students with disabilities, among others, in order to strengthen the scale. The greatest limitation in this kind of study will always be the lack of financing to cover the cost of fieldwork which would allow for broadening the specter of the population to obtain larger samples.

Keywords: social networks, college students, media, media influence.

1. Introduction

The influence the new forms of communication (blog, chat, social network) have on the formation of the identity of young people and their social behavior, is important, as it becomes an alternate route which broadens the spaces and times of social coexistence with family and friends. However, the interaction of adolescents in traditional spaces such as school, cafes, parties, among others, has been annulled (Morduchowicz, 2012).

Social networks are one of the basic tools used for communication nowadays in knowledge-based society. The growth of social networks has brought about their being included in

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environments of formation, not only for administrative work and information for families, but rather within teaching practices, to transmit information and as a means of working in collaboration with others (Marín-Díaz, Cabero-Almenara, 2019).

Social network sites are spaces whose priority is interpersonal contact between individuals or groups, besides establishing personal, professional and geographic connections, among others, stimulating the construction of week links. In online society the concept of connectivity is a quantifiable value which is also known as popularity. That is, the more contacts an individual has, the more valuable that person is because people recognize that he/she is popular and will want to have a relationship with them (Van Dijck, 2016).

Empirical studies on the addiction to the internet suggest alterations in functions such as inhibitory control, decision-making and verbal fluidity. However, it is impossible to establish a profile which indicates the risk for developing addictions in university students. They also point out that more studies need to be carried out to allow for differentiating the addiction on the types of application and where variables such as sex, type of work and stimulus are taken into account (Bernabéu et al., 2020).

In a study carried out at the University of Granada, Spain with 1013 students participating, Romero-Rodriguez et al. (Romero-Rodriguez et al., 2021) found that the abuse in use of internet mainly affects the states of depression, anxiety and stress, and to a lesser degree, self-control. On the other hand, addiction to the internet is spreading among young people, increasing fatigue, anxiety, tension, unrest and errors in everyday life.

Social networks are a part of everyday life; however, it is estimated that problems of mental health in young people have increased along with the increase in social networks. In one systematic review of thirteen studies carried out by Keles et al. (Keles et al., 2020), four areas of predominance in social networks were discovered: time dedicated, activity, investment and addiction. There was a correlation between these areas and depression, anxiety and psychological unrest. Nevertheless, it was pointed out that deeper studies in qualitative research and cohort longitudinal studies are required. It has been documented that people with social anxiety and loneliness are involved in a more problematic way seeking support on social networks (O'Day, Heimberg, 2021). This interaction on social networks is to make up for the lack of physical contact with other people. This study concluded that the problematic use of social networks is due to the frequency and not the pattern of use. At the same time, they recommend more longitudinal studies be made in order to decrease the bi-directional relations between loneliness, social anxiety and the use of social networks.

Along another line, to determine the mediating effect of envy in relation to social networks and the fear of loss, a study is underway in China, in which 704 adolescents are participating. The results show evidence that the addiction to social networks is positively associated with fear of loss. Meanwhile, an analysis of moderate mediation indicated a stronger relationship for adolescents with a greater necessity of belonging (Yin et al., 2021).

Ünal-Aydin et al.'s (Ünal-Aydin et al., 2020) research with 337 individuals was meant to determine the potential role of the recognition of emotions played in the development of addiction to social networks and thus propose alternative solutions to the problems entailed in this addiction. The results showed that there are deficits in recognition of emotions among people with addictions to social networks. The mechanisms behind addiction to social networks in adults mainly remain hidden, and for this reason Liu and Ma (2019) developed a study of 463 university students. The results indicate that on-line social support and the fear of loss interceded in the relationship between anxious attachment and the addiction to social networks both in parallel and serial ways. Moreover, on-line social support presented a negative mediation to anxious attachment and the addiction to social networks. In conclusion, it was found that anxious attachment is related to addiction to social networks.

The effect that addiction to social networks has on students' academic performance was studied by Azizi et al. (Azizi et al., 2019). They carried out a cross sectional stratified random sampling study with 360 students. The findings indicate with a statistically significant difference that the male participants are more prone to addiction to social networks. There is a negative, statistically significant relation between students' addiction to social networks and their academic performance.

Through the years the phenomenon of addiction to social networks has increased. The study by Gong et al. (Gong et al., 2019) is centered on determining the process of the formation of this addiction. In their study 335 users of WeChat participated. The results showed that addictive

behavior is determined by the perception of the benefits for the individual, such as social and hedonic benefits, of social networks on the cellular phone. These benefits are influenced by the sense of belonging and habit as distal causes and the benefits perceived are proximal causes.

In research, personality type D (tendency to negative affectivity and social inhibition) has been considered a risk factor for addition to social networks. In the face of this, a study of 679 adolescents was carried out and the findings show that, while controlling for age and sex, the personality type D positively correlated to addiction of social networks. The affective relations with friends also tempers the mediating effect. For adolescents with type D personalities and low degrees of affective relationships with friends, the addiction to social networks was significant. On the contrary, when there are high degrees of affective relationships, the relation was not significant. Thus, it was concluded that type D personality was a risk factor when combined with other factors such as affective relationships with friends, which contributes to addiction of social networks among adolescents (Jia et al., 2019).

The use of social networks causes problems in psychological functioning. In the work of Balikci et al. (Balikci et al., 2020), the association between metacognitive beliefs and problems of social networks among young people was analyzed. 308 individuals participated in the study where variance/covariance analysis was used, with Pearson Correlation and multiple linear regression. The findings show that young people with addiction to social networks showed high scores on all the evaluations on the scale of addiction to social networks and on the questionnaire of metacognition, with the exception of cognitive self-consciousness. Negative beliefs about uncontrollability and dangerous concerns, cognitive confidence and the need to control thoughts are associated with dimensions of modification of the frame of mind, relapse and conflict. The study concludes that dysfunctional metacognitive beliefs are related to the problems of young people's using social networks.

In a study by Li et al. (Li et al., 2022), the reciprocal relationship between fear of loss, the use of social networks and addiction to smart phones is analyzed. 1258 university students in China participated in the study. The results show that a close relationship between fear of loss, the use of social networks and addiction to smart phones exists. The excessive use of social networks and high degrees of fear of the loss of belonging contribute to the addiction to smart phones. Furthermore, the addiction to smart phones also increases the use of social networks and the degree of fear of loss. Thus, a bidirectional influence among the addiction to smart phones, the use of social networks and the fear of loss is suggested.

In research by Chen and Roberts (Chen, Roberts, 2020) they explored the variables conformity, improvement, social and confrontation mediated between the types of personality, kindness, extraversion, neuroticism and openness to experience, as well as the addiction to social networks. Also, impulse control was included as a moderator. 304 users of social networks participated in the study which used structural equations for data analysis. The results show the conformity, improvement and motives of confrontation which act as mediators among the various types of personalities and addiction to social networks.

It becomes pertinent to ask ourselves: What factors explain university students' addiction to social networks? What is the underlying structure in the explanation of the phenomenon of addiction to social networks? Thus, our objective: to evaluate the factors which make up the scale of addiction to social networks. Moreover, we hope to determine and validate the underlying structure that explains addiction to social networks in university students.

2. Materials and methods

Our study is of a non-experimental design taking into account that the independent variables are not manipulated and the temporality of data collection. It is cross-sectional since the information was collected at one time. The empirical study is addressed from the hypothetical-deductive paradigm, which is descriptive, exploratory and confirmatory.

Participants and samples

The population of the study is public university students in the state of Sonora, Mexico. The sample is non-probabilistic by self-determination and the census was voluntary. The criterion of inclusion is students registered in the semester who accepted to participate voluntarily and anonymously by answering a questionnaire. Authorization had been obtained from the heads of the university. The instrument was answered digitally and accessed by way of a QR code.

The total number of students at the end of the survey was 356, 128 women and 228 men. 97 % of the participants were between 17 and 24 years old. 68 % only study while 32 % study and work. 52 % of the students are in the first year of university, 39 % in the second and third years and the rest from the fourth year on. In a first filter it was found that in 5 cases the students did not interact on social networks, and they were therefore excluded. Of the students who did use social networks, 97 % used them on their phones and the rest on computers. With reference to where the students connect to social networks, the answers indicated that at home and at school were the two main spaces for connecting to social networks.

In relation to the frequency of connection to social networks, 35 % said they are always connected and another 35 % said that they connected between seven and twelve times a day. 39 % said they personally know over 70 % of their contacts on social networks, 31 % said they know between 51 % and 70 % of their contacts. The rest physically know at least half of the people with whom they interact on social networks. On social networks they share information about their identification, 72 % affirming that the information with which they identify themselves on social networks is real. With respect to the reasons for using social networks, 52 % used it to socialize, for academic and work purposes while 39 % say they use it only for socializing. 5 % use it exclusively for academic purposes and 2 % use it exclusively for work-related purposes is 2 %.

Instrument

The scale used in this study is a questionnaire of addiction to social networks (ARS) designed by Escurra and Salas (2014). The instrument is made up of two parts. The first section asks for socio-demographic information (sex, age, years of studies, present-day activity, educational program, semester, means they most frequently use to connect social networks, place and frequency they connect, people they know personally on the social networks, use of real information on social networks, kind of use they give to social networks). The second section is made up of 24 questions with a Likert scale on what they feel, think and do on social networks. There are five options for answers in this section: always, almost always, sometimes, almost never and never.

The ARS scale is made up of three dimensions (Table 1). The first dimension includes 10 items and is called “obsession with social networks” and refers to the mental ties with social networks, continuously thinking about them, as well as anxiety and anguish for not having access to them. The second dimension is made up of 6 items called “lack of personal control in the use of social networks. In this dimension we find apprehension for the lack of control or suspension of social networks, causing abandonment of school and daily life obligations. In the third dimension, “the excessive use of social networks,” made up of 8 items, we see the difficulties for regulating the use of social networks, the time and impossibility of decreasing their use (Escurra, Salas, 2014).

Table 1. Dimensions and items which make up the ARS scale

Dimension	Ítems
Obsession with social networks	2, 3, 5, 6, 7, 13, 15, 19, 22, 23
Lack of personal control in the use of social networks	4, 11, 12, 14, 20, 24
Excessive use of social networks	1, 8, 9, 10, 16, 17, 18, 21

Source: Escurra, Salas, 2014.

Procedure

To analyze the data, we first verified the internal consistency and reliability of all items as well as the normality. If it is found that the univariant is biased or has an excess of Kurtosis, analysis using polychoric correlation matrices. Following, in order to obtain underlying structure of the database exploratory factor analysis with extraction of components and Varimax rotation. With the factor solution obtained, confirmatory structural analysis is carried out using AMOS v23.

The resulting model is evaluated for absolute fit, structural fit and parsimony to achieve the best adjustment model (Hair et al., 1999). The indicators for measurement areX^2 (chi squared), Goodnes of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI), Root Mean Square Error Approximation Fit Index RMSEA) and the Comparative fit index (CFI), which compare the estimate model with the null model that indicates the independence of the variables being studied.

Internal consistency and validity test

The instrument was validated using Cronbach alpha coefficient, where $\alpha = .9$ scale for the 24 items was obtained (without including the corresponding social-demographic information). $\propto = .87$ was obtained for the three dimensions which make up the scale, these values being greater than .7, which indicates acceptability according to what Oviedo and Campo-Arias (Oviedo and Campo-Arias, 2005) described. Thus, it was concluded that the instrument complies with the desirable characteristics of internal consistency and reliability for validating a scale. 351 cases were validated, excluding the 5 cases which corresponded to participants who said they never used social networks.

Data normality

To verify data normality, the data matrix was evaluated using the asymmetric values which must be less than 2 and in the kurtosis the values should be less than 7, besides the asymmetric significance KS-1 (Kim, 2013). In Table 2 the values of asymmetry and Kurtosis are shown. Here it can be seen that they do not comply with said criteria, since in most cases the values are negative. The asymptotic significance does not exceed the recommended threshold (>.05), the reason for which it must be assumed that the data matrix does not present normality.

Table 2. Statistical Description, asymmetry and Kurtosis

Variables	$\bar{X}$ Measure	Standard Deviation	Asymmetry	Kurtosis	Asymptotic Signifiance Kolmogorov-Smirnov)
X1	3.1	1.05	-.007	-.45	.000
X2	3.44	.992	-.242	-.238	.000
X3	3.92	1.021	-.92	.605	.000
X4	3.05	1.186	-.042	-.84	.000
X5	3.91	1.084	-.82	.052	.000
X6	4.29	.987	-1.423	1.447	.000
X7	4.04	1.072	-.995	.254	.000
X8	3.44	1.053	-.103	-.673	.000
X9	2.96	1.222	.035	-.858	.000
X10	2.87	1.107	.089	-.648	.000
X11	3.72	1.093	-.609	-.132	.000
X12	3.12	1.296	-.179	-1.005	.000
X13	2.78	1.248	.142	-.989	.000
X14	3.43	1.121	-.4	-.419	.000
X15	4.08	1.029	-1.024	.482	.000
X16	3.05	1.111	-.208	-.616	.000
X17	2.85	1.103	.046	-.629	.000
X18	2.87	1.241	.085	-.905	.000
X19	4.07	1.033	-1.098	.817	.000
X20	3.72	1.065	-.545	-.183	.000
X21	3.52	1.055	-.372	-.283	.000
X22	4.26	2.906	15.226	267.108	.000
X23	3.97	1.028	-.927	.517	.000
X24	3.68	1.196	-.698	-.317	.000

Note: n = 351

Faced with the absence of data normality, evaluating using polychoric correlation matrices for measuring (Ogasawara, 2011; Timmerman, Lorenzo-Seva, 2011) and Chi-squared statistics with *n* degrees of freedom and the Bartlett's sphericity test with Kaiser to evaluate the pertinence of performing Factorial Exploratory Analysis was recommended. Thus, FEA was carried out to obtain a factorial solution based on the extraction of principle components and Varimax rotation.

3. Discussion and Results

The results obtained with FEA are now presented: Bartlett's sphericity test deliver the value Chi-squared of 4092.154 with 276 *gl* and p-value <.001 and the Kaiser-Meyer-Olkin (KMO) measure of 0.937 as well as the MSA values which all exceeded the > 0.5 threshold, making them

acceptable values. Besides the polychoric correlation matrices show positive values in all cases (Table 3), which provides evidence use FEA.

Table 3. Matrices of polychoric correlations and measurements of sample adequacy

Item	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	MSA
X1	1	0.684	0.523	0.487	0.478	0.452	0.509	0.454	0.347	0.425	0.495	0.435	.941
X2		1	0.57	0.448	0.436	0.441	0.425	0.429	0.32	0.38	0.453	0.348	.919
X3			1	0.393	0.435	0.478	0.421	0.4	0.233	0.319	0.43	0.238	.927
X4				1	0.415	0.379	0.432	0.374	0.364	0.521	0.405	0.275	.953
X5					1	0.578	0.611	0.505	0.373	0.397	0.456	0.313	.973
X6						1	0.701	0.558	0.342	0.358	0.494	0.315	.927
X7							1	0.575	0.403	0.429	0.503	0.416	.941
X8								1	0.365	0.411	0.485	0.337	.958
X9									1	0.666	0.357	0.427	.916
X10										1	0.418	0.493	.918
X11											1	0.351	.967
X12												1	.899
	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23	X24	MSA
X13	1.00	-0.01	-0.08	-0.19	-0.21	-0.22	-0.13	-0.13	-0.14	-0.10	-0.15	-0.13	.846
X14		1.00	0.43	0.39	0.35	0.19	0.38	0.35	0.31	0.20	0.37	0.49	.942
X15			1.00	0.37	0.39	0.27	0.49	0.35	0.37	0.16	0.47	0.44	.948
X16				1.00	0.65	0.41	0.35	0.48	0.41	0.08	0.40	0.52	.950
X17					1.00	0.48	0.32	0.46	0.48	0.12	0.41	0.47	.944
X18						1.00	0.26	0.31	0.33	0.11	0.34	0.33	.963
X19							1.00	0.51	0.36	0.23	0.43	0.48	.939
X20								1.00	0.54	0.21	0.49	0.52	.934
X21									1.00	0.17	0.63	0.41	.922
X22										1.00	0.20	0.21	.848
X23											1.00	0.47	.925
X24												1.00	.935

Five components were obtained in the extraction of principle components which account for 61.31 % of the variance explained (Table 4).

Table 5 shows the rotated components matrix.

Table 4. Explanation of Total Variance

Factors	F1	F2	F3	F4	F5
Values	3.896	3.378	2.628	2.570	2.242
% variance	16.235	14.075	10.951	10.709	9.340
Accumulated variance	16.235	30.310	41.261	51.970	61.310

Table 5. Rotated components matrix

Item	Component				
	F1	F2	F3	F4	F5
X6. I get in a bad mood if I can't connect to social networks.	.791				
X7. I feel anxious when I can't connect to social networks.	.740				
X8. Access and use of social networks makes me feel relieved. It relaxes me.	.698				
X5. I don't know what to do when I am disconnected from social networks.	.672				
X15. Even when I'm doing something else, I'm thinking about what's going on on social networks.	.559				
X11. I think about what might be happening on social networks.	.540				
X12. I think I should control my urge to connect to social networks.		.726			
X10. I usually spend more time on social networks than what I'd originally planned on.		.721			
X9. I lose track of time when I connect to social networks.		.708			
X16. I spend a lot of time each day connecting and disconnecting from social networks.		.591			
X24. I think the intensity and frequency I access and use social networks is a problem.		.572			
X20. I neglect homework and studying to be connected to social networks.			.631		
X23. When I'm in class without access to social networks I feel bored.			.627		
X21. Even when I'm in class I secretly connect to social networks.			.600		
X22. My girlfriend/boyfriend or friends or relatives have called attention to my dedication to and time spent on social networks.			.561		
X19. I ignore my friends and family so I can be connected to social networks.			.502		
X2. I need more and more time to take care of matters related to social networks.				.738	
X3. The time I used to spend connected to social networks isn't enough anymore. I need more.				.684	
X1. I feel a great need to keep connected to social networks.				.662	
X14. I try unsuccessfully to control my habits of prolonged and intense use of social networks.					
X13. I can remain without access to social networks for several days.					.643
X18. I am aware of alerts sent to my phone or computer from social networks.					.524
X4. As soon as I wake up, I connect to social networks.					.516
X17. I spend a lot of time connected to social networks.					.500

Note: Method for extraction using analysis of principle components. Method of rotation with Varimax and normalization Kaiser. The rotation has converged 7 iterations. Item X14 does not present a charge $> .5$.

Confirmatory test

With the factorial solution obtained in FEA, we now proceed to the confirmation of the model of initial measurement, but using SEM methodology based on these criteria: Charges must be $\geq .07$ in order to evaluate the adjustment of the various existing models of indicators of goodness of fit which may be used, depending on the size of the sample, the kind of variables and the points, among others (Hair et al., 1999). These indicators are index of normed adjustment (INA), index of

non-normed adjustments (INNA), the index of incremental adjustments (IIA), the index of comparative adjustments (ICA) and the root mean squared error (RMSE).

The goodness of fit allows for establishing a model which predicts that the correlation matrix for the structural equations model is the maximum Chi-squared plausibility. This criterion to determine probability, whose value should be between two and three, allows us to verify that the model presents an acceptable adjustment, although it may reach five (Hair et al., 1999). With respect to the index of the goodness of fit (IGF), this indicates whether the model shows an acceptable fit when it nears one. If it nears zero, then it has a bad fit. The root mean squared error (EMSE) is an index of population discrepancy that when it has values equal to or less than .10 is evidence of a good fit of the model. However, if the values are less than or equal to .05, this shows an optimum fit of the model (Hu, Bentler, 1995). In Figure 1 a model of standardized estimators is presented.

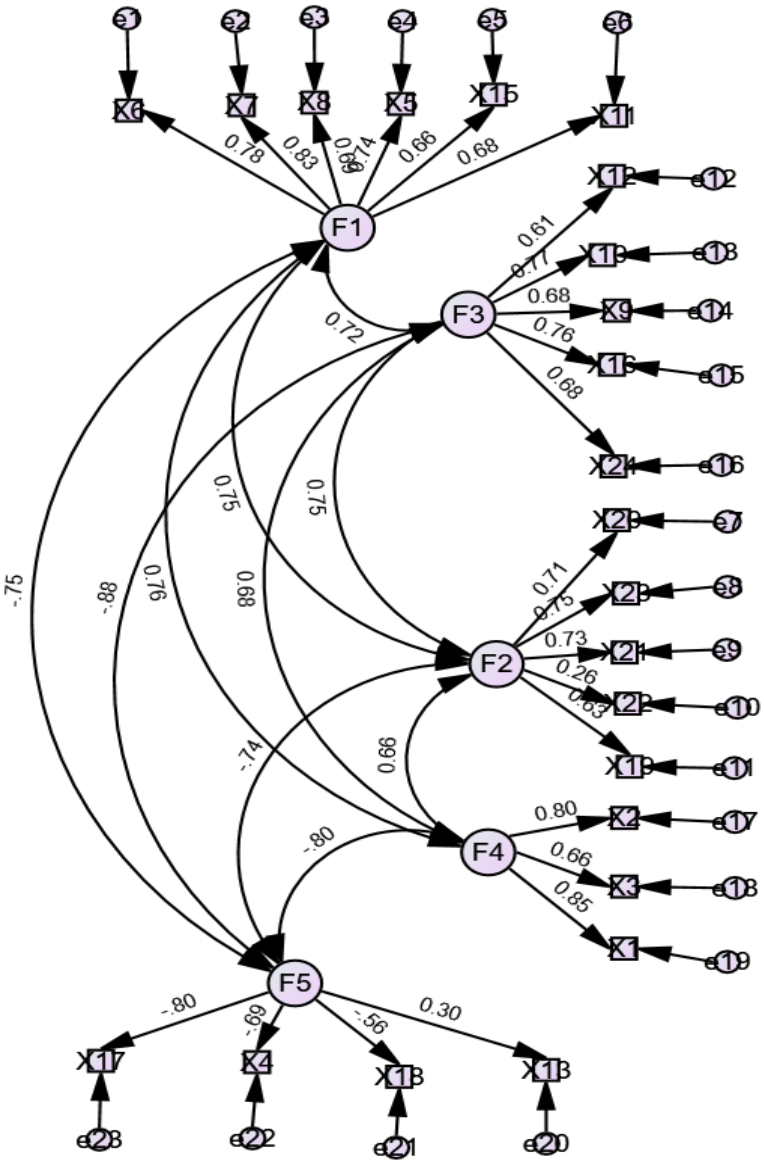

Fig. 1. Model of standardized estimators

To verify whether the model in figure 1 should be adjusted, the index of the maximum Chi-squared plausibility is used to prove the hypothesis of independence among the variables. The values obtained are CMIN/DF (2.558), RMSEA (.066), TLI (.885) and CFI (.908) and parsimony goodness of fit > .05, which indicates the model has a satisfactory fit. However, it is desirable to improve the values of the standardized estimators (>.65) and exclude the negative values. Thus, the model must be further adjusted.

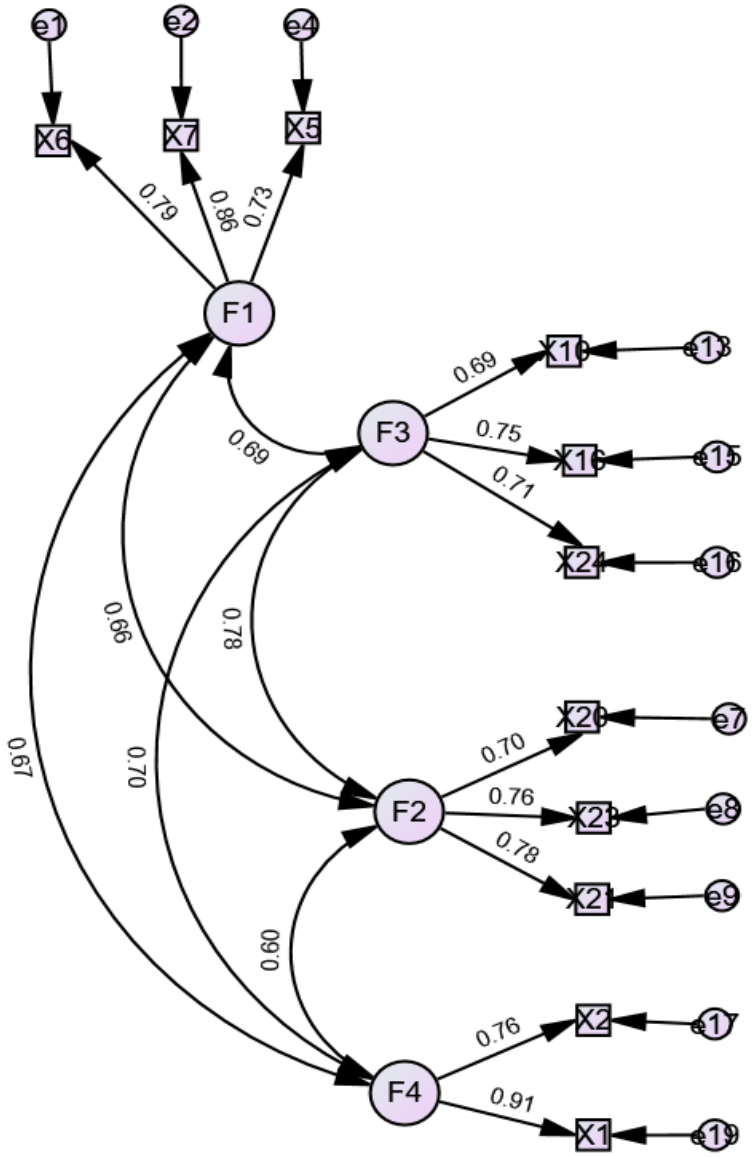

Fig. 2. Model of addiction to social networks

Table 6. Matrix of rotated components (confirmatory model)

Item	F1	F2	F3	F4
X6. I get in a bad mood if I can't connect to social networks.	.791			
X7. I feel anxious when I can't connect to social networks.	.740			
X5. I don't know what to do when I am disconnected from social networks	.672			
X10. I usually spend more time on social networks than I had originally planned to.		.721		
X16. I spend a lot of time each day connecting to and disconnecting from social networks.		.591		
X24.I think the intensity and frequency I access and use social networks is a problem.		.572		
X20. I neglect homework and studying to be connected to social networks.			.631	
X23. When I'm in class without access to social networks I feel bored.			.627	
X21. Even when I'm in class I secretly connect to social networks.			.600	
X19. I ignore my friends and family so I can be connected to social networks.			.502	
X2. I need more and more time to take care of matters related to social networks.				.738
X1. I feel a great need to keep connected to social networks.				.662

The results of model 2 of addiction to social networks show the following: Chi-squared = 82.705 degrees of freedom = 38 Probability level = .000, CMIN/DF (2.176); RMSEA (0.05); TLI (0.956), CFI (0.974) as well as the values of parsimony (>.5), which indicate the best fit for the model (Figure 2 and Table 6).

4. Conclusion

The results show a four-factor model which differs from Escurra and Salas' (2014) model, that presents three factors. Factor F1 is made up of three items (X6, X7, X5) which coincide with the factor of obsession for social networks of Escurra and Salas' model. Factor F2, excessive time on social networks is made up of items S10, X16 and X24. Factor F3, I neglect social and school activities for social networks, consists of items X20, X23, X21 and X19. Factor F4, the need to be connected, includes items X2 and X1. Factor 2, Excessive time on social networks is made up of three items, of which two of them make up lack of personal control on the use of social networks of Escurra and Salas' model.

Moreover, the model with four factors consists of two items, in contrast to Escurra and Salas' model in which the three factors make a total of 24 items. Similarly, Gonzalez et al. (Gonzalez et al., 2021), using the ARS scale with Mexican adolescents who attend high school in the private sector obtained a three-factor model, coinciding the factors of obsession to social networks and excessive use of social networks with Escurra and Salas' model, but with eleven of the original 24 items. Likewise, Lobos-Rivera et al (Lobos-Rivera et al., 2022) in a study on Salvadoran adults using the ARS scale obtained three factors, discarding 6 items from the original scale.

Bueno et al. (Bueno et al., 2019) found that the ARS scale applied to secondary students in public schools in Peru, presented a five-factor structure with an explained variance of 61.54 % in contrast to Escurra and Salas' three factors. Thus, it may be established that the dimensions of the scales emerge depending on the population being studied and on this the reliability of the model for determining addictions to social networks will be based.

Future lines of research

Future studies should broaden the sample to include other scenarios such as students in private schools, in rural area, Indigenous students, students with disabilities, among othesr to strengthen the scale. Similarly, the present study was developed for higher education and could be expanded to investigate other educational levels.

Furthermore, the possibility of building an instrument for evaluating addiction to social networks with the rapid growth of technology and the ever-growing number of people who are using one or various social networks simultaneously should be explored.

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Bricolage as an Alternative Way of Solving Educational Problems

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Abstract

The article considers the problems of modern education, innovative teaching methods, with the description of their practical application in the world and domestic pedagogical practice. Theoretical and practical aspects of bricolage as an alternative approach to education are studied in detail. It offers practical study of the subject by means of non-standard use of various materials with the use of previously created objects as resources for new projects. Characteristic features of bricolage as an innovative teaching method and a step-by-step description of the process of its practical realization on the basis of the conducted experiment on the creation of a distance learning course Bricolage course on the basis of Google Class online service: "By teaching we learn". The conducted experiment is an attempt to optimize the process of teaching English to 6th grade pupils of a comprehensive school on the basis of joint use of information technologies and bricolage as an alternative approach to education. Statistical analysis and evaluation of the experimental data through the application of series of dynamics was carried out. The results obtained at the end of the experiment allow us to speak about its success and justify the choice of the experiment model, in which the parents of students were the instrument of bricolage.

Keywords: bricolage, alternative approaches to education, innovative pedagogical methods, Google classroom, statistical analysis.

1. Introduction

In today's world, the use of digital information technologies in all areas of human endeavor is rapidly increasing. Among the most widespread technologies, it is worth mentioning the involvement of artificial intelligence (Ignatiev et al., 2019; Zakharov et al., 2022), machine learning (Filippov et al., 2022) and neural network technologies (Zemenkova et al., 2022), artificial intelligence systems exemplified by large language models LLMs such as GPT generated, LLama and others. The field of education is no exception, the limiting factors here are often the requirements for significant energy and infra-structural resources, not always available to institutions of higher education. Since the use of all kinds of smartphones and other gadgets among young people has become widely spread, the use of simplified models of intelligent digital learning technologies and small language models SLM (Borisova et al., 2021; Libing Wang, Tiachong Wang, 2024) will be more widespread.

Currently, there are problems in the field of education, for the solution of which traditional ways of organizing the educational process are not suitable, their successful overcoming is seen

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from the position of supplementing the existing educational system with alternative methods of education (Kharlamova et al., 2023; Potapova et al., 2023; Vinogradova et al., 2021).

Thus, one of the innovative educational trends is bricolage (Elsukov, 2012; Meirovitz et al., 2022; Varlakova et al., 2023). The use of this method of teaching allows the teacher to approach the creation of a new projectcreatively, using exactly what he or she needs, because this method does not require and does not imply the availability of ready-made methodological recommendations and authorizations of guidance. Instead, the teacher and learners can use available media technologies, materials and tools that were not originally intended for educational needs in an attempt to present their students with a new method of learning, replacing the routine learning process with more active entertainment activities.

The relevance of this article is due to the presence of a number of problems in modern education, the solution of which is seen, among other things, by filling the pedagogical practice with non-traditional ways and methods of organizing the educational process and greater involvement of information technologies (Korelskaya et al., 2021; Ovchinnikova et al., 2023; Shestakova, Morgunov, 2023).

In the conditions of ever-increasing educational load on students and insufficient time allocated in general education institutions for mastering and consolidation of knowledge, the methods of teaching, which involve providing students with the opportunity to independently study additional lecture material at a convenient time for them, are becoming increasingly important (Clement, Miles 2017; Gerasimova et al., 2022; Saba, 2003).

The object of the study is alternative innovative forms of teaching that involve modern information technologies.

The subject of the study is the use of one of the modern pedagogical innovations – bricolage.

The purpose of this work is to identify and study the features of the organization of the learning process when using bricolage as an innovative pedagogical method.

To achieve this goal, it is proposed to solve the following tasks:

To analyze the current state of the educational process in the information society.

To consider the theoretical basis and prerequisites for the emergence of bricolage as an alternative way of solving educational problems.

To study examples of practical use of bricolage in foreign and domestic pedagogical practice.

To develop and implement an educational course meeting the principles of bricolage on the basis of free Internet service Google Class.

2. Materials and methods

The analysis of the current state of the educational process in the information society

Modern approach to the learning process involves the formation of information interaction between a teacher and students and the development of skills and abilities of the latter to independently orient in a large volume of information and the formation of students' non-standard creative thinking. The main goal of the teacher's innovative activity becomes a qualitative change in the personality of the student with a great emphasis on creating conditions for self-motivation and self-education of the student.

The authors of works (Ferguson et al., 2019; Sharples et al., 2014) emphasize the following ten pedagogical innovations:

– Massive open social learning (Massive open social learning);
– Learning design informed by analytics (Learning design informed by analytics);
– Flipped classroom;
– BYOD (Bring-your-own-devices);
– Learning to learn;
– Dynamic assessment;
– Event-based learning;
– Learning through storytelling;
– Threshold concepts;
– Bricolage.

Let us analyze the listed innovative teaching methods. It should be noted at once that the Massive open social learning method (Hill, 2015) is based on the use of well-known MOOCs (Massive Open Online Courses) and social networks to engage learners in the educational process.

Massive open online courses (MOOCs), social games and quizzes are the main tools of engagement. The peculiarities of this approach are that learners meet only online and for short periods of time.

Learning design informed by analytics is often used to develop courses and lesson series and uses data analytics to create a coherent sequence of pedagogical tools and technologies (Mangaroska et al., 2020). The analytical approach used in the creation of methods contributes to the development of successful learning and teaching.

When using the Flipped classroom method, learners are engaged independently. Only tasks and exercises are discussed in detail with the teacher (Papadakis et al., 2019). The value of this method lies in the possibility to use lesson time for group activities, where learners can discuss the content of the lecture, check and supplement their knowledge, as well as devote more time to practical activities.

Bring-your-own-devices (BYOD, known in Russia as mobile learning) method of learning gives preference to smart phones or other modern gadgets with a specific training program in applications available to learners for classroom and home learning. The main advantage of BYOD is that the learning process may not be tied to a permanent stay in an educational institution, learners remain involved in the learning process even outside the institution (Ignashchuk et al., 2015).

Let us note the method of meta-learning (Learning to learn), which allows learners to acquire knowledge in a certain area in an easy and accessible form (Thrun et al., 2012). The essence of the method is self-education based on the use of online resources via the Internet. In order to achieve results, the method provides an opportunity to manage the process of knowledge acquisition through setting specific goals.

Stimulus assessment (Dynamic assessment) as a teaching method focuses on the evaluation of students' progress and achievements (Le et al., 2023). The essence of this method is to compare the results of one and the same student at different stages, which allows to take into account the individual characteristics of students and stimulate the desire for development.

The use of different types of thematic events (exhibitions, holidays, festivals) to involve students in the educational process suggests the method of event-based learning (Jurascheka et al., 2020) (Event-based learning). The advantage of this method is the involvement, personal interest and responsibility of each participant for their contribution to the common project and, as a consequence, to their education.

The method consists in the development of logically structured and effectively presented lecture material Learning through storytelling method (Bartan, 2020), involves writing stories that develop imagination, logic of thinking and, in general, the cultural component of the learner.

Involving certain background knowledge of learners to build an optimal learning process refers to the Threshold concepts method (Stopford, 2021). The challenging aspect of threshold concepts is that they often seem strange and unpredictable, and yet there is a growing interest in using threshold knowledge for subsequent successful learning in various disciplines.

Bricolage (Blankenship, 2020), which closes the list of the presented above methods, involves, according to the translation, reworking and using existing knowledge and constructs as resources for building new knowledge and projects. The method can be used for designing creative innovations and generating new ideas. It can be guided in organizing the interaction of relevant groups of people in order to implement innovative models in practice.

Bricolage takes the tenth places in the considered list, but it does not mean its last place in terms of its capabilities. The method, having as its main feature the ability to transform and adapt any available materials and practices for its own benefit, can easily use any of the above mentioned list of teaching methods as one of the components of its integrated approach to learning.

The considered educational methods show a variety of possible forms and methods of organizing the educational process that differ from the traditional approach.

The Czech multimedia project "Receptář (The Book of Prescriptions)" projects and know-how, is one of the examples of practical application of alternative teaching methods in foreign countries. Its main purpose is to organize the exchange of modern ideas This project is a full-fledged implementation of the bricolage learning method.

Another example of integrated application of such alternative learning methods as bricolage and BYOD, or mobile learning, is the South African project "Yoza Cellphone Stories", which consists of the use of mobile phones and BYOD (UNESCO-Fazheng, 2019), which consists of using young people's cell phones. The main goal of the Yoza Cellphone Stories project is to provide young

people with access to reading fiction by distributing it on their cell phones. This project creates a new community of readers and addresses the problem of insufficient supply of printed books.

A Russian example of using the bricolage approach to create multimedia products is the "Smeshariki" series. It combines a number of short stories aimed at a multi-age audience. The series was created as part of the educational project "The World Without Violence" with the support of the Ministry of Culture of the Russian Federation. The project is designed not only for children's audience. The stories are interesting for both children and adults. The series is in demand only in Russia, now it is broadcast in 60 countries and translated into 15 languages (Karpova, 2020).

The modern approach to the learning process implies the formation of information interaction between teachers and students, the development of the latter's skills and abilities to navigate a large volume of information and the formation of non-standard creative thinking of students.

The use of various media (Internet, television, social networks, etc.) by students presupposes their mastery of basic aspects of media literacy. Namely:

– Ability to interact with different types of media;
– A critical approach to the information provided;
– The ability to assess the reliability of its content;
– Taking into account copyright law and media economics.

These aspects are to be taken into account and monitored by the teacher.

Thus, the considered innovative methods of organizing educational and cultural projects, successfully implemented both in our country and abroad, clearly demonstrate changes in the traditional approach to the learning process, their active supplementation with modern alternative approaches.

Bricolage as an alternative way of solving educational problems

Let us consider examples of using the concept of bricolage in education. The terms "bricolage" and "bricoleur" in relation to processes in science and art were firstly used by French philosopher, ethnologist and culturologist Claude Lévi-Strauss. In his work (Galieva, Ibragimova, 2017), bricolage is defined as a form of activity that can be speculatively called "primary" rather than primitive science. According to C. Lévi-Strauss, a bricoleur can be defined as someone who creates a new thing by himself, independently, using available improvised means as opposed to the means used by a specialist. Each separate element can simultaneously reproduce a whole set of relations, both concrete and potential. In this case, all elements act as operators, suitable for any single-type operations.

When developing a training course in relation to the way of practical realization of bricolage as an alternative educational approach, we will adhere to the point of view of C. Lévi-Strauss, which implies the cumulative use of available and newly invented means and techniques, rather than opposing them to each other.

As follows from the previous considerations, the term "bricolage" defines a creative approach to working with any improvised means and materials. There are two known ways of using bricolage in pedagogy.

The first approach involves enabling individuals to create using improvised materials. Through the process of bricolage, both the learner and the materials are transformed through the use of imagination: a carpet becomes a rushing stream, sofa cushions become boulders, and children see themselves as explorers and discoverers, adopting various roles. At the same time, participants — particularly children — find enjoyment in the learning process by engaging in creative activities with a diverse range of objects, which they can modify and combine in any way they choose. This promotes sensory awareness of the shapes, properties, and qualities of various materials and their potential uses. Such experiences can be valuable for fostering creativity in a range of professional fields, from entry-level positions to specialist and managerial roles.

The second approach to integrating bricolage in education centers on fostering innovation and exploring new methods and technologies. The digitalization of educational resources, the proliferation of smartphone applications, and their growing use in the learning process have facilitated the rise of interactive classrooms. Physical attendance at classes and meetings is no longer essential for learning. A notable example of an alternative educational model that incorporates bricolage principles is the use of cloud storage via the Internet. In this scenario, the entire repository of information—shared files, curated materials on specific topics, discussions

of ideas, and more — can be stored in publicly accessible platforms (EDUTECH, 2014), such as Yandex Disk or Google Drive, allowing learners to access resources as needed.

The results of the 2014 Indian researchers' analysis of the use of pedagogical innovations (Sickel, Witzig 2016) show that educational programs created using cloud-based technologies rank 5 out of 10. The leading position in the analysis of Indian researchers is occupied by the method of learning based on the flipped classroom, and the same method is one of the first mentioned in this article.

Let's consider the process of creating an educational course based on the Google Classroom online service, which is integrated with Google Drive, Google Docs, Gmail and YouTube services.

Developing an online educational course based on bricolage principles

The experiment was conducted to optimize the educational process of teaching English to secondary school students using information technology and bricolage as an alternative approach to learning. The conducted experiment is based on two key elements that meet the stated requirements:

1. The experiment is conducted on the basis of Google Class Internet service.

2. The tool of bricolage as an alternative approach to learning is parents of schoolchildren who participate in the experiment together with their children.

At present, Google Class (Google Class Support, 2022) is a convenient and accessible way for students and teachers to communicate at a new level - now it is not limited by the limits of the classroom and strictly designated time of the class. Google Class allows teachers to create classes and add students, invite teachers to jointly teach a course, send assignments to students, organize thematic discussions, individual lessons, etc. In turn, students can receive assignments and submit completed work through the service, complete assignments online in Google Docs, comment and create entries in a shared news feed, etc.

All created documents are saved on Google Drive, which allows them to be available to both teachers and students at any time, eliminating the need to provide voluminous printed materials. The teacher can monitor the list of completed work in real time, check assignments, assign grades, and send the checked work to the student with a comment if it is necessary.

In this paper, the use of bricolage as an alternative way of solving educational problems is presented as an experiment to optimize the educational process. In order to comply with the basic principle of bricolage (using available resources and means in a non-standard way), we will use Google Classroom service to create a Bricolage course: "By teaching we learn", aimed at distance learning English for students in addition to the general educational program in order to repeat and consolidate students' knowledge by teaching parents, i.e. using parents as a bricolage tool, see Figure 1.

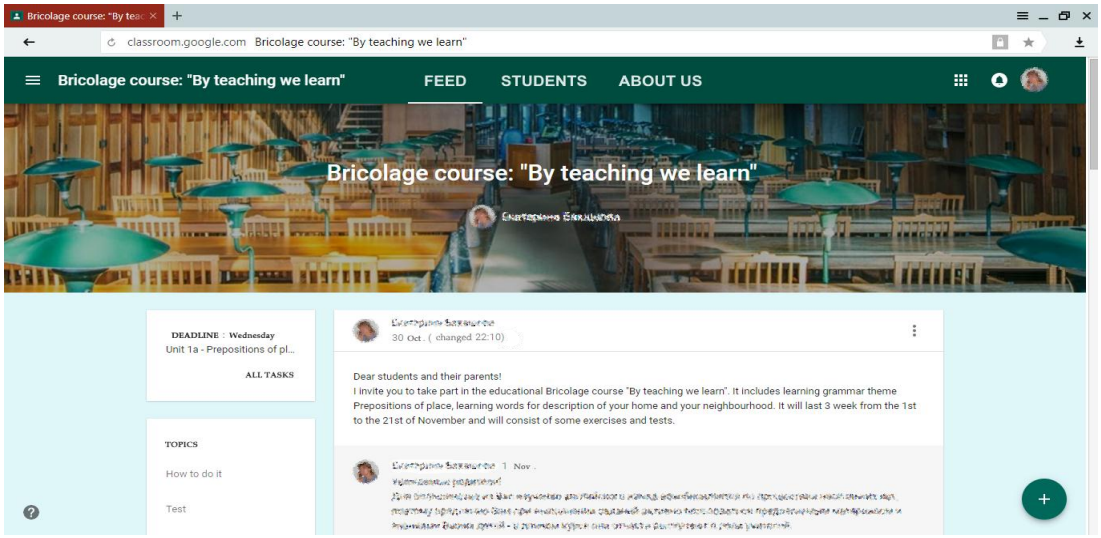

Fig. 1. Start page of the Bricolage course "By teaching we learn"

The Bricolage course: "By teaching we learn" involves pupils and their parents learning together the grammar and vocabulary material provided, with pupils acting partly as teachers,

as they are tasked with explaining to parents the grammatical rules of the topic and supervising the learning of the vocabulary. Thus, the aim of Bricolage course is:

1. To Involve parents in the process of learning English as children's learners, i.e. using them as a bricolage tool.
2. To revise and consolidate students' knowledge, skills and practice by explaining the material learned to their parents.
3. To increase the students' interest in learning English, their personal responsibility for achieving positive personal results and successfully implement joint activities with their parents.

The Bricolage course "By teaching we learn" was successfully conducted in a class of 14 students (7 students and 7 parents) from November 1 to November 21, 2023. In three consecutive lessons, participants were taught the topics "Prepositions of place" and "Description of my home and my neighborhood", see Figures 2, a) and b).

Exercise 2.
Look at the picture and answer the questions. Use the prepositions: ~~*in*~~, *behind, under, between, next to, on.*

Where is the woman?
She is ___***in***___ the house.
1. Where's the man?
   He's _____ the window.
2. Where is the horse?
   It is _____ the man.
3. Where are the trees?
   They're _____ the house.
4. Where's the rabbit?
   It's _____ the trees.
5. Where is the cat?
   It is _____ the roof.

Fig. 2a. An example of an exercise on the topic "Prepositions of place"

Exercise 3.
Look at the picture and number the phrases.

	0	in the butcher's
A		next to the boy
B		under the bank
C		on the butcher's
D		between the woman and the man
E		in front of the butcher's
F		above the bank

Fig. 2b. An example of an exercise on the topic "Description of my home and my neighborhood"

The course also contains introductory and final tests, see Figure 3.

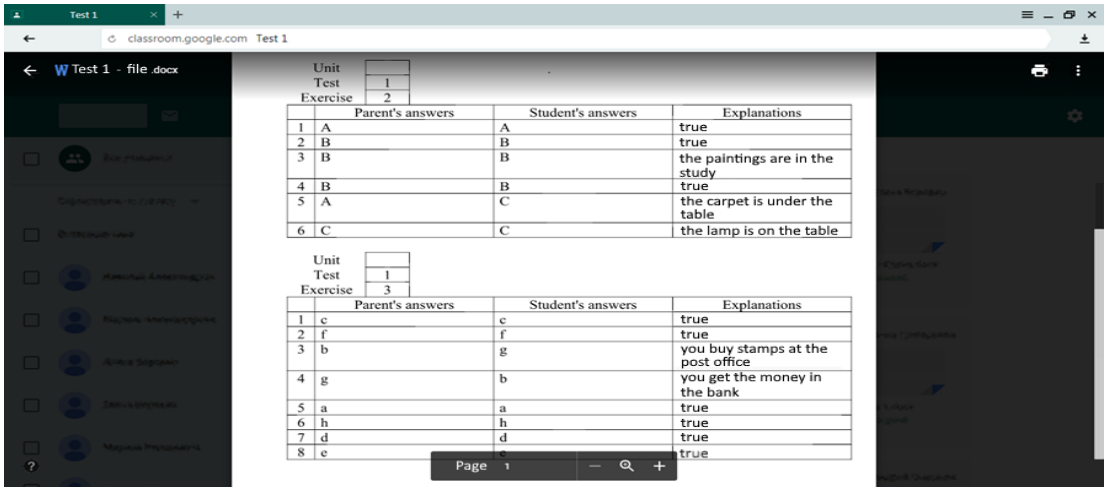

Fig. 3. Example of the completed form of answers to tasks from Test 1

We would like to emphasize the advantages of the ability to identify participants by their personal Google account – the last name and first name of the participant are automatically displayed in the lists of course participants. However, in order not to disclose personal information, their First and Last names are identified, for example, Student A / Parent A.

When performing some tasks, students had difficulties in explaining the material to their parents; in such cases, they turned to the course leader for help and clarification. This allowed the students to get timely answers to controversial questions and feel the teacher's support even in the conditions of online learning (Dorofeev, Korchagina, 2023).

When completing the tasks, both parents and pupils were responsible and attentive to the materials offered to them for study. When they received back work that had been graded low due to errors in their answers, participants had the opportunity to resubmit the answer form, if time permitted, before the deadline to improve their final score.

In some works of the course participants in addition to written answers, video recordings of their dialogs were also presented.

All participants of the Bricolage course: "By teaching we learn" met the stated deadline for completing the tasks of the final test. The results of completing the tasks, including introductory, intermediate and final tests, by the participants of the Bricolage course: "By teaching we learn" are reflected in Table 1.

Table 1. Results of completing the tasks of the Bricolage course: "By teaching we learn"

Bricolage course: “By teaching we learn”	Overall result	04.11	08.11	13.11	17.11	21.11
Participants of the educational course		Test 1	Unit 1a	Unit 1b	Unit 1c	Test 2
Student E	99,2	100	100	96	100	100
Student A	92,8	86	91	100	93	94
Parent A	76,0	67	64	74	86	89
Student B	91,8	86	100	83	93	97
Parent B	81,6	67	73	83	93	92
Student C	89,6	90	91	96	79	92
Parent C	86,6	90	91	91	75	86
Student D	99,2	100	100	96	100	100
Parent D	97,8	100	100	96	93	100
Parent E	92,8	90	91	87	96	100
Student F	98,2	100	91	100	100	100
Parent F	97,4	100	91	96	100	100
Parent G	68,0	52	64	78	71	75
Student G	84,4	57	91	91	89	94
Class average grade	89,67	84,64	88,43	90,5	90,57	94,21

During the course participants' performance on the sequential assignments, their results were predominantly positive, with growth and maintenance of high scores for both individual course participants and the class as a whole, see Figures 4, a) and b).

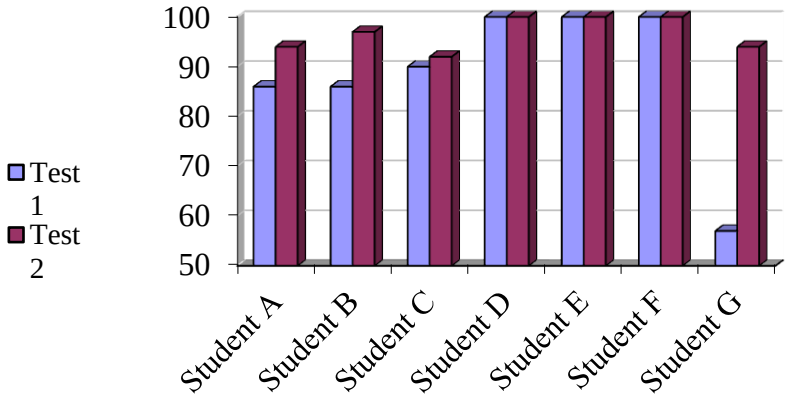

Fig. 4a. Dynamics of grades of pupils – participants of the Bricolage course: "By teaching we learn" for completed tests

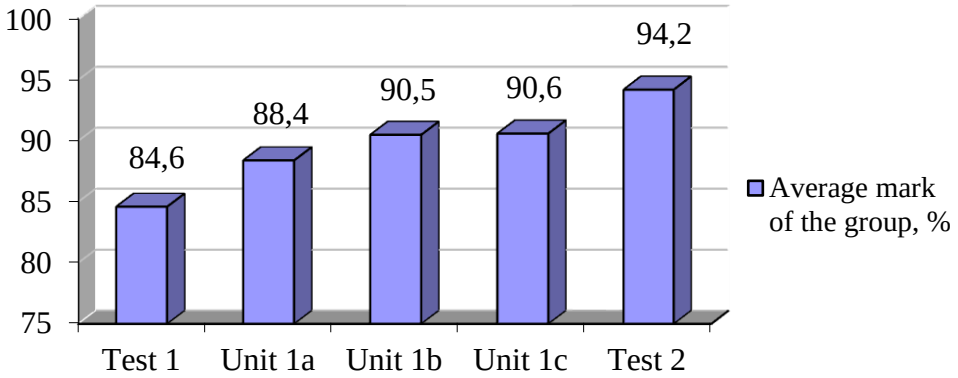

Fig. 4b. Dynamics of average grade by class of Bricolage course: "By teaching we learn"

3. Discussion and Results

The empirical data obtained during the experiment were analyzed using statistical analysis (Rock, 2016; Batkovskiy, 2020), see Table 2.

Table 2. Analysis of the dynamics of academic performance of the group of participants of the online course "By teaching we learn"

Stages	Average score	Absolute growth		Growth factor		Growth rate	
		Chain	Basic	Chain	Basic	Chain	Basic
0	84,64	—	—	—	1.00	—	100
1	88,43	3,79	3,79	1,04	1,04	104	104
2	90,5	2,07	5,86	1,02	1,07	102	107
3	90,57	0,07	5,93	1	1,07	100	107
4	94,21	3,64	9,57	1,04	1,11	104	111

In order to evaluate and analyze the dynamics of academic performance of the participants of the online course "By teaching we learn", we will use series of dynamics. These series contain two types of statistical indicators.

1. Time moments (introductory testing stage, intermediate testing stages, final testing stage).

2. Indicators of the levels of the series. Since the methodology of analyzing series of dynamics allows expressing their levels equally as absolute values and relative indicators or average values, we use the average sum of scores for the whole group, obtained for each stage of testing, rather than for each participant of the course separately, as indicators of the levels of the series.

The following requirements were taken into account in the process of constructing the series of dynamics:

– All indicators of the dynamics series are reliable; comparable in time; comparable in content;

– All indicators of the dynamics series are given in the same units of measurement.

Absolute growths show by how many units the subsequent level of the series has changed compared to the previous one – chain absolute growths (1) or compared to the initial level – base absolute growths (2).

$$\Delta y^c = y_i - y_{i-1}, \quad (1)$$

$$\Delta y^b = y_i - y_0, (2)$$

where Δy - absolute growth (Δy^c - chain, Δy^b - base),

y_i –level of the series for the current period,

y_{i-1} –level of the series of the previous period,

y_0 – initial level of the series.

The increase in absolute growth indicates that the average performance of the group has increased at each successive stage of testing.

The growth coefficient shows how many times the level of the series has changed compared to the previous one – chain growth coefficients (3) or compared to the initial level - base growth coefficients (4).

$$K_g^c = \frac{y_i}{y_{i-1}}, \quad (3)$$

$$K_g^b = \frac{y_i}{y_0}, (4)$$

The growth rate shows the number of percentages of the next level of the series compared to the previous one – chain growth rate (5) or compared to the initial level - base growth rate (6).

$$R_g^c = \frac{y_i}{y_{i-1}} \times 100\%, (5)$$

$$R_g^b = \frac{y_i}{y_0} \times 100\%, (6)$$

The presented results of statistical analysis clearly demonstrate the growth of pupils' performance in the process of jointly mastering grammatical and lexical material on a given topic with their parents. The positive effect on the growth of pupils' interest in the learning process organized with the use of bricolage as an alternative pedagogical method and, as a consequence, the increase in the level of knowledge acquisition was also due to the fact that pupils, acting partly in the role of a teacher, found themselves in an unfamiliar but rather responsible situation, when parents perceived them as more knowledgeable and listened to their recommendations when performing tasks. Pupils' consistent study of the provided information in the proposed form allows them to gradually accumulate knowledge and develop practical skills of applying the acquired knowledge.

3. Conclusion

The presented results of the consecutive solution of the tasks set by the research allowed us to confirm the main features and principles of bricolage organization as an innovative teaching principle.

Bricolage, considered in this article, as one of the innovative pedagogical methods is a rather interesting and effective way of learning.

The hypothesis about the usefulness of attracting alternative methods of learning in addition to traditional ways of organizing the educational process in order to successfully overcome the problems that currently exist in the field of education is confirmed.

As the next stage in the study of bricolage as an alternative method of learning to help solve existing educational problems, we can propose an experiment similar to the conducted one, but in which the instrument of bricolage will be junior school students.

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Visual Aesthetics and Cinematic Techniques in Indian Mythological Films: An In-Depth Exploration

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Abstract

This study explores the distinct artistic and technical qualities of Indian mythological films by focusing on the visual aesthetics and cinematic devices that characterize them. Indian mythological films use a unique visual language to bring ancient epics and folklore to life. It is firmly anchored in cultural and religious traditions. This study looks at the lavish costumes, vivid color schemes, and complex set designs that all add to the immersive experience of the genre. To improve the storyline, it also examines how special effects, camera work, and editing techniques are used. Examining contemporary and influential works, the study shows how filmmakers mix new technologies with classic motifs to appeal to a broad audience. The study examines audience response, narrative structures, and directing approaches through popular film acceptance case studies. This analysis aims to highlight how important visual storytelling is to the preservation and popularisation of Indian mythology, as well as how it affects the larger cinematic landscape. The study concludes that the combination of inventive cinematic techniques and rich visual aesthetics protects a cultural legacy and pushes the genre into new creative realms, guaranteeing its continued significance in modern film.

Keywords: Mythology Films, Bollywood, in-depth analysis, Indian movies, visual aesthetics.

1. Introduction

Indian mythological films, which combine traditional narrative methods with contemporary storytelling styles, have made a name for themselves in the film industry. These movies, which have their roots in folklore and ancient epics, serve as a vehicle for the preservation and advancement of cultural narratives in addition to being a source of enjoyment. To cater to a modern audience, the genre has changed over time, adopting cutting-edge cinematic methods and visual styles. With a focus on how these components contribute to the distinct identity and audience appeal of the genre, this study attempts to investigate the complex interactions between visual aesthetics and cinematic techniques in Indian mythological films (Dwyer, 2006; Valančiūnas, 2008).

A mythical film's narrative and immersive experience are greatly influenced by its visual aesthetics. For example, set designs, color schemes, and costumes are painstakingly created to immerse viewers in the mythological eras being portrayed. For example, the 2018 horror movie Tumbbad enhances its horror components by using a dark, atmospheric color palette to generate a sense of mystery and foreboding (Rajadhyaksha et al., 1999). In addition to giving the stories more depth, this meticulous attention to visual elements also serves to support the narratives' historical and cultural background.

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In mythical movies, cinematic elements like editing, special effects, and camera work enhance the narrative even more. Despite receiving mixed reviews, the film Adipurush (2023) demonstrates how modern technology may be used to bring ancient tales to life through the use of high-quality computer-generated imagery and visual effects (Gokulsing et al., 2004). These methods are crucial to producing the larger-than-life images that define the genre and allow filmmakers to credibly represent supernatural interventions and fantastical aspects.

The financial aspect of mythological films also provides significant insights into the genre's evolution. The budget and box office performance of films like *Brahmastra Part One: Shiva*(2022) and *Kantara* (2022) illustrate the varying degrees of commercial success within the genre. While *Brahmastra* struggled to break even despite a substantial budget, *Kantara* achieved remarkable success with a comparatively modest investment (Box Office India, 2022). Analyzing these financial metrics helps in understanding the economic viability and audience reception of mythological films.

Another important component of this study is audience response, as indicated by critical reviews and IMDb ratings. Adipurush's low rating raises the possibility of discrepancies between audience expectations and cinematic execution; whereas high ratings for movies like Tumbbad and Kantara imply a positive reception of its visual and narrative aspects (IMDb, 2023). To determine the elements influencing the critical and financial success or failure of these movies, this study looks at these ratings.

The study also examines how authentically these movies represent mythical stories and characters, probing their cultural authenticity. Accurate depictions of customs and mythology in movies such as *Hanuman*(2021) are highly praised by those who are familiar with these tales (Desai, 2004). The integrity and attraction of the genre depend on this cultural faithfulness.

This research attempts to describe the general patterns and distinctive practices that characterize the visual aesthetics and cinematic methods in Indian mythological films through a comparative analysis of the chosen films. Through an analysis of these components' interactions, the study aims to present a thorough picture of the genre's present situation as well as possible future developments.

By combining quantitative and qualitative data, this study provides a thorough examination of the visual aesthetics and cinematic devices seen in Indian mythological films. By using this diverse approach, the study hopes to shed light on the elements that contribute to the genre's ongoing appeal and dynamic character, providing insightful information for fans, academics, and filmmakers alike.

2. Material and methods

The study uses a mixed-methods approach to examine the visual aesthetics and cinematic devices in Indian mythological films by combining qualitative and quantitative data. The five movies that have been released in the last five years make up the primary data set: *Tumbbad, Adipurush, and Brahmastra Part One: Shiva, Hanuman,* and *Kantara*. A movie's budget, box office receipts, and IMDb rating are among the most important data points gathered. These movies were picked to give a broad picture of the genre by showcasing a variety of production values and viewer reactions. The financial aspects and the film's reception by the public are the main subjects of the quantitative study. Each film's return on investment (ROI), which offers insight into its commercial performance, is determined using the budget and box office collection numbers. We look at IMDb ratings to see how well-received the film was by the public and critics. This information aids in determining relationships between budget for production, artistic merit, and audience satisfaction. The visual aesthetics and cinematic techniques used in each movie are examined in the qualitative analysis. This entails thoroughly examining the editing styles, camera work, special effects, color schemes, and set designs. To achieve this, we employ content analysis to interpret and classify visual components that support the films' overarching aesthetic and story.

3. Discussion

The paper "Reconfiguring the Use of Video in Qualitative Research Through Practices of Filmmaking" highlights the transformative potential of video technology in qualitative research. It challenges traditional human-centred approaches by incorporating innovative filmmaking techniques that redefine what is considered "data," including non-human entities and sensory experiences. The authors advocate for a shift from language to visual and sensory elements,

democratising research by offering richer insights. Grounded in post-qualitative methodologies, the review suggests that these practices can reveal new forms of analysis that traditional methods may overlook (Menning et al., 2024).

The paper explores the underexamined concept of walking in experimental film and video, using a phenomenological approach to highlight its significance. It discusses diverse films that portray walking as a complex, disorienting experience connected to themes like social mobility, feminism, and urban memory. The paper underscores the link between walking and avant-garde storytelling, showcasing how experimental films push narrative boundaries. Additionally, walking is portrayed as a medium for cultural and social commentary, reflecting broader implications tied to identity and place. The review concludes by calling for further research in this area (Boczkowska, 2024).

The paper explores how filmmakers use editing techniques, such as elliptical and overlapping cuts, to manipulate the perceived duration of scenes, ensuring narrative flow and coherence. The paper addresses the gap in the literature by empirically validating the perceptual effects of these techniques, showing that time-expanded scenes are often overestimated in duration compared to compressed ones. It also highlights the interaction between scene characteristics and editing style in influencing time perception. The findings have important implications for filmmakers and researchers, emphasizing the need for interdisciplinary approaches to understand the psychological effects of cinematic techniques (Liapi et al., 2024).

The review of the film *Essentieel* (1964), created by Belgian abstract painter Jef Verheyen in collaboration with poet Paul De Vree, highlights its significance as a cinematic representation of Verheyen's exploration of light and colour. The film is positioned within the broader context of experimental cinema and the ZERO art movement, which sought to transcend traditional artistic boundaries. The review discusses Verheyen's collaborations with neo-avant-garde artists and the film's connection to the 1959 exhibition "Vision in Motion – Motion in Vision," a key event for the ZERO movement. The analysis of "Essentieel" examines its thematic and aesthetic elements, reflecting Verheyen's artistic aspirations and its impact on contemporary experimental cinema. The review concludes with references to critical essays and retrospectives that further explore Verheyen's contributions to abstract art and film (Jacobs et al., 2023).

The paper "The Upscaling of the Early Cinema Image through Artificial Intelligence" by Luis Navarrete-Cardero and Carlos Ramírez-Moreno examines how modern machine learning techniques intersect with early cinema images. It references psychological perspectives on aesthetic experience from authors like Renoir and Debray to explore viewer perception. The paper discusses image theory with contributions from Burch, Morin, and Bazin, focusing on realism in cinema and its impact on AI-enhanced images. It addresses the tension between traditional film restoration and AI upscaling, emphasizing Manovich's concept of cultural transcoding. Employing a hermeneutic analysis, the paper explores the aesthetic, significant, and ontological implications of mutated images, highlighting concerns about their aesthetic interference, relationship with reality, and ontological status (Navarrete-Cardero et al., 2023).

The paper "High-Fidelity Vibrokinetic Stimulation Induces Sustained Changes in Intercortical Coherence During a Cinematic Experience" explores the impact of HFVK technology on audiovisual (AV) immersion. It discusses how HFVK technology enhances immersive experiences, though its neurophysiological mechanisms are not fully understood. The study employed EEG to measure brain activity in subjects experiencing HFVK stimulation versus a control group, focusing on alpha- and theta-band activities. Key findings include enhanced coherence in brain areas related to emotion and AV-spatial processing, and uniform interhemispheric decoherence with the left insula in HFVK subjects. This research demonstrates the sustained effects of HFVK on brain activity, offering new insights into its role in enhancing AV experiences (Boasen et al., 2020).

The paper "Cinema and the Digital Revolution: The Representations of Digital Culture in Films" examines how popular cinema from 1980 to 2010 reflects and engages with digital culture. It highlights the impact of digital advancements like cyberspace, social media, and virtual communities on film narratives. The study analyzes four films: *WarGames* (1983), which explores early computer technology; *Perfect Blue* (1997), focusing on digital culture's psychological effects; *Pulse* (2001), presenting a horror perspective on technology; and *Life in a Day* (2011), capturing collective human experiences through digital means. The paper argues that these films reflect and critique the technological and social changes of their times, illustrating the significant influence of digitization on cinema and storytelling techniques (Gürkan et al., 2024).

The paper disclosed the intersection of touch and emotions, highlighting recent psychological and neuroscientific findings that establish a strong link between tactile stimuli and emotional responses. The rise of 4D cinema, which adds tactile vibrations to audiovisual experiences, has prompted research into how these multisensory elements influence viewer engagement and emotional processing. EEG studies have shown that emotional content alters brain activity, particularly in the frontal and orbitofrontal areas associated with emotion and attention. The addition of vibrotactile stimuli during film viewing increases brain activity in these areas, enhancing emotional intensity. The study also explores the clinical implications of haptic stimulation for therapeutic use and includes participant feedback on emotional experiences, providing a comprehensive view of how tactile stimuli affect emotional perception (Cerdán et al., 2024).

The early Indian cinema business was built on the foundation of Indian mythological stories, particularly those from the Ramayana and Mahabharata. Mythological films played a significant role in establishing the Indian film industry. Twenty-five films, the majority of which were mythological, were created in India between the years 1913 and 1919. The popularity of the genre began to decline in the 1940s, although it continued to be popular in South India, particularly in Telugu cinema, until the 1980s. Madras emerged as a key film hub with mythologicals as the dominating genre after the advent of sound in 1931. This was even though mythological films experienced a decrease during the latter part of the 1940s. The fact that mythological films continued to be shown in Telugu cinema up until the 1980s is evidence of both their economic viability and the cultural relevance they hold within the context of Indian film culture (Vardhan, 2011).

An examination of the development of the mythological genre in Indian cinema is presented in this dissertation. Particular attention is paid to the depiction of gods and heroes from Hindu myths and epics. It investigates how audience feedback changed cinematic portrayals throughout time, which resulted in changes in how characters were portrayed and the tales told within the genre. The research investigates the difficulties that producers encounter when attempting to depict divinities and avatars on screen. These difficulties include worries about regulation as well as competition from other popular genres such as social cinema. In addition to this, it explores the impact that the genre has had on other mediums, such as picture books and television, demonstrating how the depictions of myth and epic have been reincarnated in various platforms (Hemphill, 2018).

The purpose of this study is to investigate the aesthetics of Bollywood cinema from a semiotic point of view, with a particular emphasis on a particular film adaptation. In addition to Narrative Structure, Cultural Context, and Mise-en-Scène, it examines semiotics, which is defined as the study of signs, codes, and signifying activities, and how it can be applied to cinema analysis. As part of the study, we will be looking at the visual design, signs, symbols, metaphors, discourse, and linguistic meanings of songs, character appearances, clothes, and musical scores that are featured in the movie. The researcher uses movies like "3 Idiots," which emphasise aptitude-based choice, to highlight the significance of career guidance and aptitude counselling (Dandekar, 2021).

4. Results

Case Studies

To provide a greater knowledge of each film's distinct artistic and technical characteristics, each film is approached as a case study. These case studies include the following:

Tumbbad: distinguishes itself in the horror genre with its distinct artistic and technical aspects, particularly its atmospheric horror aesthetics and innovative use of low-budget special effects. The film's aesthetic is profoundly entrenched in precise set design and lighting, which create an eerie, immersive universe greatly influenced by Indian mythology and tradition. The village of Tumbbad, drenched in constant rain, provides a melancholy backdrop that heightens the film's sense of dread and doom. The use of natural lighting, combined with purposeful shadows and flickering oil lights, contributes to the film's dark, brooding atmosphere (R, 2023).

Technically, *Tumbbad* is a masterpiece of low-budget brilliance. The producers used physical effects and minimal CGI to give the scary aspects a sense of authenticity and tangibleness. For example, the team's use of prosthetics and makeup to create the hideous monster Hastar is both convincing and horrifying, demonstrating their inventiveness. The special effects, while small in size, are seamlessly interwoven into the story, preserving the film's realism and immersive quality (Helene, 2019).

The unique camera work, which includes tight close-ups and dynamic movement, conveys *Tumbbad*'s claustrophobic and unpleasant atmosphere. This, along with a riveting soundscape that matches the visual storytelling, elevates *Tumbbad* to the level of masterful atmospheric horror. Its accomplishment highlights how artistic vision and technological prowess can overcome financial restraints, resulting in a visually gorgeous and psychologically disturbing film experience (Morgan, 2019).

*Brahmastra Part One: Shiva***:** stands out for its ambitious, spectacular effects and intricate story framework, establishing it as a notable contribution to Indian cinema. Artistically, the film is visually spectacular, employing cutting-edge CGI to create a fantasy universe that effortlessly combines mythology and the contemporary. The special effects are big and intricate, bringing the Astry (mystical weapons) and their powers to life in a visually appealing and narratively relevant manner. The scenes involving the film's fire-wielding protagonist, Shiva, are especially noteworthy, with flames depicted in a highly realistic and dynamic manner, demonstrating the film's technical expertise (Kumar, 2022).

The narrative framework of *Brahmastra* is equally grandiose, involving several narratives and people from various timelines. This intricate story combines aspects of Indian mythology with a contemporary plot, resulting in a fascinating tapestry that explores issues of power, heritage, and destiny. The film's pacing is meticulously controlled, blending exposition with action to keep the audience engaged. Flashbacks and backstory disclosures are expertly interwoven to add depth to the people and the world they inhabit (Pro, 2022).

Technically, the film uses modern VFX methods and cutting-edge photography, pushing the limits of what is possible in Indian filmmaking. The blend of actual effects and digital upgrades creates a cohesive visual experience. Overall, "Brahmastra Part One: Shiva" demonstrates the ability of Indian filmmaking to develop globally competitive, high-concept visual narratives (Ramnath, 2022).

Adipurush: is a famous example of high-budget Indian cinema, attempting to bring the epic story of the Ramayana to life using cutting-edge visual effects. Artistically, the film aims to create a huge visual spectacle by employing advanced CGI to recreate mythological events and people in a modern and entertaining manner. The visual effects are intended to highlight the story's larger-than-life elements, such as the magnificent representation of celestial creatures and the dramatic war moments. The careful design of the characters, their costumes, and their supernatural abilities exemplifies the film's desire to combine traditional mythology with modern visual narrative (Balakumar, 2023).

Technically, *Adipurush* uses a large budget to push the limits of Indian visual effects. The film uses sophisticated motion capture technology and elaborate CGI to create realistic and immersive worlds. The action sequences, particularly those incorporating supernatural aspects, are designed with meticulous detail and dynamism to capture the spectator and elevate the tale (Bhaskar, 2023).

Despite its technical advances, *Adipurush* struggled with audience reaction. Critics and spectators pointed out inconsistencies in the portrayal of beloved legendary characters, as well as a perceived over-reliance on CGI, which at times overwhelmed the narrative's emotional depth. Combining faithfulness to the source material with contemporary cinematic expectations proved difficult, resulting in conflicting reactions. While the visual effects were lauded for their ambition, the film's response underlined the challenge of meeting various audience expectations while reconstructing cultural epics (Chauhan, 2022).

Hanuman: The film *Hanuman* demonstrates how effective use of a limited budget may produce fascinating visual narratives. The film's artistic qualities are founded on its vivid and precise animation technique, which brings the epic story to life with remarkable clarity and ingenuity. The color palette is rich and lively, adding visual appeal and keeping the audience engaged. Technically, the film uses a combination of conventional and digital animation techniques, resulting in fluid action and vibrant character designs. This mix results in a seamless storytelling experience that is both current and timeless (Sharma, 2024).

Despite its modest budget, *Hanuman* achieves great production value by strategically allocating resources. The special effects are used sparingly, complementing critical situations without overpowering the storyline. This balance ensures the story is the centre point, with visual effects supporting rather than overshadowing it. Another standout feature is the sound design,

which includes a well-crafted score and sound effects that suit the on-screen action and add to the overall immersion (The Economic Times, 2024).

The film's success stems from its ability to tell a vast mythological story with modest funding; demonstrating that creativity and good planning can transcend financial restraints. "Hanuman" exemplifies the power of storytelling and the excellent application of technical talents in animation, making it a notable example in its genre.

Kantara:*Kantara* stands out for its exceptional artistic and technical qualities, particularly its cultural authenticity and excellent audience ratings achieved on a limited budget. Artistically, the film is firmly based on local culture and traditions, perfectly merging myth and reality. The genuine portrayal of rituals, clothing, and languages exemplifies cultural immersion, enriching the narrative and providing the spectator with a vivid, immersive experience. The use of natural landscapes and traditional settings adds to the film's realism, taking viewers deep into rural India (Chalapathi, 2022).

Technically, *Kantara* succeeds at cinematography and sound design. The cinematography depicts the raw beauty and harshness of the rural area, utilizing natural lighting to great advantage. This method not only enhances the realism but also emphasizes the film's thematic focus on the relationship between people and nature. The sound design, which includes traditional music and ambient sounds, immerses the audience in the film's atmosphere and enhances the plot (Basu et al., 2023).

Despite its limited budget, *Kantara* has received great viewer ratings, owing to its engaging story and strong acting. The film's success can be due to its precise attention to detail and efficient use of resources, demonstrating that a well-crafted tale and genuine portrayal can elicit strong reactions from audiences. *Kantara* demonstrates how cultural authenticity and technical ability may result in a cinematic masterpiece that defies budget constraints (Shetty et al., 2022).

Comparative Analysis

To comprehend the relationship between the chosen films' budgets, visual appeal, and audience response, a comparative analysis is carried out. To evaluate how well the technological and artistic components translated into financial success and critical acclaim, compare the ROI and IMDb ratings.

The methodology offers a comprehensive understanding of the visual aesthetics and cinematic methods of Indian mythological films by fusing quantitative measures with qualitative observations. This method explores the creative processes that define the genre as well as the commercial and critical results of the movies. The goal of the study is to clarify the elements that contribute to the creative excellence and commercial success of Indian mythical cinema through this comprehensive investigation.

Table 1. Code Book Part 1

SR. No.	Name of the Film	Visual Aesthetics			Special Effects and CGI		Cinematography		Narrative Structure	
		Color Palettes	Set Designs	Costumes & Makeup	Quality and Realism	Integration with Narrative	Camera Angles and Movement	Lighting	Storytelling Techniques	Pacing and editing
1	*Tumbbad*	8	10	9	9	10	10	9	10	9
2	*Adipurush*	8	8	9	6	8	8	8	7	6
3	*Brahmastra Part One: Shiva*	8	8	7	9	8	8	8	7	7
4	*Hanuman*	9	8	8	9	9	8	8	8	8
5	*Kantara*	8	8	7	10	10	8	10	10	10

Table 2. Code Book Part 2

SR. No.	Name of the Film	Cultural Authenticity		Financial Analysis		Innovative Techniques		Character Representation	
		Depiction of Mythological Elements	Incorporation of Traditional Practices	Budget Utilization	Return on Investment (ROI)	New Technologies	Creative Approaches	Protagonist & Antagonist Portrayal	Supporting Characters
1	*Tumbbad*	10	10	8	8	9	9	10	10
2	*Adipurush*	9	9	8	8	7	7	8	7
3	*Brahmastra Part One: Shiva*	8	7	9	8	9	8	8	7
4	*Hanuman*	9	8	9	8	9	8	9	8
5	*Kantara*	10	10	10	10	9	9	10	10

Thematic Analysis of Indian Mythological Films

This study performs a thematic analysis of selected Indian mythological films to explore recurring themes, patterns, and significant aspects across these narratives. The films analysed include *Tumbbad, Adipurush, Brahmastra Part One: Shiva, Hanuman,* and *Kantara*. The analysis focuses on visual aesthetics, special effects, cinematography, narrative structure, cultural authenticity, audience engagement, financial analysis, innovative techniques, character representation, and comparative analysis.

Visual Aesthetics

The visual aesthetics of these films play a crucial role in enhancing the narrative and engaging the audience. Each film employs a unique color palette, set design, and costume makeup to reflect its mythological setting.

– Color Palettes: The films use vibrant and thematic color schemes to enhance the narrative. "Tumbbad" employs dark and atmospheric colors, while *Adipurush* uses vibrant and intense colors to depict grandeur and divinity.

– Set Designs: Elaborate and culturally rich set designs are a common feature. *Hanuman* uses traditional mythological designs, while *Brahmastra* integrates modern and fantastical elements.

– Costumes and Makeup: Detailed and authentic costumes reflect the mythological era and characters. *Kantara* and *Hanuman* focus on traditional authenticity, whereas *Adipurush* emphasizes grandeur.

Special Effects and CGI

High-quality CGI and special effects are integral to these films, bringing mythological elements to life and enhancing storytelling.

– Quality and Realism: *Adipurush* and *Brahmastra* utilize high-quality CGI to depict divine and supernatural elements realistically.

– Integration with Narrative: Special effects are seamlessly integrated into the narrative, enhancing the storytelling. *Tumbbad* uses low-budget but effective special effects to create a horror atmosphere.

Cinematography

The cinematography in these films varies from dynamic and creative camera work to traditional methods, capturing the grandeur and intensity of the scenes.

– Camera Angles and Movement: Dynamic and creative camera work is used to capture the grandeur of scenes. *Hanuman* and *Kantara* use traditional methods, while *Brahmastra* employs modern techniques.

– Lighting: The use of lighting ranges from natural and warm in *Kantara* to dramatic and ethereal in *Adipurush*.

Narrative Structure

The narrative structures blend traditional storytelling methods with contemporary styles, focusing on cultural authenticity and modern twists.

– Storytelling Techniques: These films blend traditional narrative methods with contemporary storytelling styles. *Hanuman* and *Kantara* focus on cultural authenticity, while *Brahmastra* incorporates modern twists.

– Pacing and Editing: The editing and pacing are designed to keep the audience engaged. "Tumbbad" uses a slower pace to build tension, while *Adipurush* maintains a faster pace.

Cultural Authenticity

Cultural authenticity is a key focus, with accurate representations of mythological stories and characters.

– Depiction of Mythological Elements: Authenticity is emphasized, with accurate representations of mythological stories and characters. *Hanuman* and *Kantara* are particularly noted for their cultural accuracy.

– Incorporation of Traditional Practices: Traditional practices and customs are integrated into the narratives, contributing to cultural richness.

Audience Engagement

These films aim to create a strong emotional connection with the audience through their storytelling and visual elements.

– Emotional Impact: The films aim to create a strong emotional connection with the audience through their storytelling and visual elements. *Kantara* is noted for its emotional depth.

– Critical Reception: Audience and critical reception vary, with *Tumbbad* and *Kantara* receiving high praise, while *Adipurush* had mixed reviews.

Financial Analysis

The financial analysis reveals varying budget utilization and returns on investment among these films.

– Budget Utilization: The films vary in budget, with *Adipurush* and *Brahmastra* having substantial investments, while *Kantara* and *Tumbbad* achieved success with modest budgets.

– Return on Investment (ROI): Films like *Kantara* and *Hanuman* showed high ROI despite lower budgets, while *Brahmastra* struggled to break even.

Table 3. Financial of Films

SN. No	*Name of Film*	*Budget*	*Box Office Collection*	*IMDb Rating*
1	*Tumbbad*	₹5 crore	₹13.57 crore worldwide	8.2
2	*Adipurush*	₹500 crore	₹432 crore worldwide	2.7
3	*Brahmastra Part One: Shiva*	₹410 crore	₹431 crore worldwide	5.6
4	*Hanuman*	₹40 crore	₹350 crore worldwide	7.9
5	*Kantara*	₹16 crore	₹400 crore worldwide	8.2

Innovative Techniques

The integration of modern CGI and visual effects is evident, along with innovative approaches to storytelling and visual presentation.

– New Technologies: The integration of modern CGI and visual effects is evident in *Adipurush* and *Brahmastra*.

– Creative Approaches: *Tumbbad* is noted for its innovative use of low-budget effects, creating a unique visual style.

Character Representation

Strong character portrayals are a hallmark of these films, with detailed and impactful depictions of protagonists and antagonists.

– Protagonist and Antagonist Portrayal: The films feature strong character portrayals, with detailed and impactful depictions of protagonists and antagonists. *Hanuman* and *Kantara* are particularly noted for their character depth.

– Supporting Characters: The supporting characters are well-developed and integral to the narrative, adding depth to the story.

Comparative Analysis

Comparing the films reveals a blend of traditional and modern elements, with cultural authenticity and high-quality visual effects being key success factors.

– *Across Films*: Comparing the films reveals a blend of traditional and modern elements. While *Hanuman* and *Kantara* focus on cultural authenticity, *Adipurush* and *Brahmastra* emphasize modern visual effects.

– Success Factors: Key success factors include cultural authenticity, high-quality visual effects, strong narrative structures, and effective audience engagement.

The thematic analysis of these selected Indian mythological films highlights their strengths in visual aesthetics, special effects, cinematography, narrative structure, cultural authenticity, audience engagement, financial analysis, innovative techniques, character representation, and comparative analysis. These films blend traditional storytelling with modern cinematic techniques, creating engaging and culturally rich narratives that resonate with audiences.

5. Conclusion

A thematic examination of selected Indian mythological films (*Tumbbad, Adipurush, Brahmastra Part One: Shiva, Hanuman*, and *Kantara*) reveals a complex interplay of visual aesthetics, narrative structure, and cultural authenticity. These films expertly combine ancient storytelling methods with modern cinematic techniques, resulting in visually spectacular and emotionally compelling stories. The unusual use of colour palettes, scene designs, and costume makeup throughout these flicks not only accentuates the legendary settings but also thoroughly engages the spectator. High-quality CGI and special effects add to the realism and immersion, while varied cinematography and lighting reflect the grandeur and drama of the epic stories.

The story framework and character depiction of each film reflect an emphasis on cultural authenticity and emotional involvement. Films like Hanuman and Kantara stand out for their culturally realistic depictions and strong emotional connections with their audiences. In contrast, Adipurush and Brahmastra use current storytelling elements and visual effects to appeal to modern audiences. The films' ability to mix conventional procedures with contemporary approaches demonstrates their success in reaching a wide audience. Financially, the variable budget allocations and returns on investment reflect the various techniques used by filmmakers to attain commercial success, with lower-budget films such as Kantara and Hanuman delivering remarkable profits.

The study suggests that the combination of traditional and modern features in Indian mythological films adds to their uniqueness and attractiveness. With careful attention to visual aesthetics, narrative strategies, and cultural representation, these films not only preserve but also revitalize ancient myths for modern viewers. These films, which incorporate advanced CGI, imaginative cinematography, and honest storytelling, propel the genre into new creative realms, ensuring its continuous relevance in contemporary cinema. The success of these films demonstrates the value of new ideas and cultural authenticity in attracting and captivating global audiences.

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Teachers' Perspective on the Integration of Media and Information Literacy into the Uruguayan Educational Curriculum

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Abstract

Media and Information Literacy (MIL) was explicitly incorporated into the Integrated Basic Education Curriculum of Uruguay in 2023. This article aims to analyze teachers' perceptions regarding this integration, considering four dimensions: a) curricular space; b) concept and scope; c) resources and key actors; and e) challenges and opportunities. To achieve this, a two-session technopedagogical experience was designed, involving 33 teachers from early, primary, secondary, and high school education from 10 departments across the country. Among the most significant findings, it is noteworthy that: a) teachers identify the lack of familiarity with the term MIL as the primary challenge for its integration, followed by the absence of specific training in the subject, particularly at the early educational levels; b) there is a predominant perception of MIL as a tool to address specific issues in the media environment, such as misinformation and digital fraud, rather than as a means to cultivate critical, informed, and creative citizens; and c) the Ceibal Center is recognized as the most committed key actor in promoting this type of education at the national level. Thus, the intention is to provide researchers, educators, and policymakers with up-to-date information regarding the configuration of this educational policy.

Keywords: media literacy, media education, media competence, educommunication, curriculum, teachers, Uruguay, Latin America, educational policies, curricular studies.

1. Introduction

Media and Information Literacy (MIL) is a critical and emancipatory process that empowers individuals to analyze, question, and transform the reality mediated by the media and information, promoting active and conscious participation in the digital society (Potter, 2022). This training involves the development of media competencies that encompass specific skills and essential knowledge to face the emerging challenges of the media ecosystem, which can be structured into four levels (Kačinová, Sabada-Chalezquer, 2022): the personal level, focused on individual empowerment through critical thinking and resilience against misinformation; the social level, which fosters collaboration and dialogue within diverse communities; the civic level, which encourages active participation in the digital public sphere and citizen empowerment; and the cultural level, which promotes understanding and respect for diversity.

According to Mihailidi (Mihailidi, 2019), due to the significant impact of media and information on daily life and civic participation, MIL should be an integral and mandatory part of educational curricula. However, Garro-Rojas (Garro-Rojas, 2020) argues that this aspect remains a "pending issue" in Latin America, largely due to the persistence of an instrumental view of the role of media in education and the lack of political will to develop comprehensive policies that engage

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various key actors, ensuring long-term sustainability. Despite these limitations, some countries in the region are making progress in this direction. Brazil has initiated the "Brazilian Strategy for Media Education" (Secretaria de Comunicação Social, 2023), which includes a series of initiatives and actions aimed at promoting media education and digital literacy among different age groups in the population. Similarly, Mexico, through the Federal Telecommunications Institute (IFT), is promoting MIL through various strategic projects (IFT, 2020).

In this context, Uruguay stands out in the region as the only country that has explicitly incorporated the concept of MIL into its educational curriculum, specifically in the curricular unit "Communication and Society" for the 9th grade (ANEP, 2023a: 24). However, an analysis of the curricular texts has shown that the objectives associated with the various dimensions of media competence are distributed across different subjects and educational levels, from early education to secondary education (Rojas-Estrada et al., 2024). These objectives range from analyzing the role of ICT in socioeconomic and environmental contexts to critically evaluating the stereotypes present in media content. Additionally, the study has revealed the use of alternative terms such as "digital citizenship" in curricular documents, without adequate clarification regarding their relationship with MIL.

Consequently, this research aims to complement existing findings by examining teachers' perceptions regarding the integration of MIL, considering aspects such as curricular space, concept and scope, key actors, available resources, teacher training, as well as the associated challenges and opportunities. This aims to provide updated and relevant information for policymakers, researchers, teachers, and other key actors interested in understanding the configuration of this educational policy.

2. Materials and methods

To determine teachers' perceptions regarding the incorporation of MIL into the curriculum of Integrated Basic Education (EBI) in Uruguay, a Digital Learning Object (DLO) has been created. This is a digital educational resource designed to facilitate the teaching and learning process and must be accessible, reusable, and have a specific educational purpose (Gava, Haviaras, 2022). The design followed the stages of the ADDIE Model (Analysis, Design, Development, Implementation, and Evaluation), an instructional framework widely used in the creation of educational materials and programs, which allows for revisions and adjustments at each phase of the process due to its cyclical nature, facilitating the continuous improvement of the design and implementation (Martínez-Rodríguez, 2009).

Analysis. The initial phase of the study focused on the selection of learning objectives associated with MIL in the Integrated Basic Education Curriculum (ANEP, 2023c), specifically identifying those that exhibited the greatest prominence within the curricular framework. Adhering to this inclusion criterion, two groups of learning objectives were established: a) one aimed at the critical analysis of information and content, and b) another centered on reflection regarding interaction processes related to ICT, such as digital security, conscious usage, and screen time.

Design. Based on this process, the integration into a didactic sequence comprising two modules was carried out (see Table 1). This sequence was structured around four key pedagogical moments: a) A starting point, designed to establish a common knowledge base among participants, thereby facilitating an initial understanding of the topic; b) Two activities aimed at the development and application of specific learning objectives related to MIL, allowing students to apply these concepts in practical situations; c) A closing activity, conceived as an opportunity for critical reflection on the integration of MIL into the curriculum.

Development. Subsequently, the didactic sequence was hosted on the Wix platform (https://competenciamediatica.wixsite.com/ami-uruguay [Anonymized]) and was reviewed by four expert researchers in MIL from Spain (1), Brazil (1), and Ecuador (2). These specialists responded to an adaptation of an instrument designed to evaluate the relevance and appropriateness of the proposed activities, in line with the established objective (Coll, Engel, 2008). As a result of this process, they recommended, among other improvements, the inclusion of a section dedicated to didactic suggestions to guide reflection on the scope of MIL, the incorporation of a greater diversity of media objects for analysis, and the implementation of the sequence in small groups, preferably with fewer than 30 participants, to optimize interaction and learning processes.

Table 1. Overview of the technopedagogical experience

Title	*Associated Learning Objectives Used*	*Example of Activities*
Module 1: Critical and Informed Citizens	9th Grade: Critically analyzes messages and stereotypes from the media (ANEP, 2023a: 230). 3rd-6th Grade/7th-8th Grade: Identifies and evaluates data and information obtained from various digital sources, contrasting their validity and credibility (ANEP, 2023b: 365).	Starting Point: Reflect on the metaphor of the media as a window into social reality. MIL Activity 1: Reflect and debate the representation of a social group in the media. MIL Activity 2: Analyze the truthfulness and reliability of a news article using a set of media content. Closing Activity: Reflect on the importance, challenges, and opportunities of teaching these contents through a teaching action map.
Module 2: Aware and Cyber-Safe Citizens	2nd-6th Grade/7th Grade: Describes situations where technology use can be an opportunity, as well as risky situations that personally involve oneself or third parties (ANEP, 2023b: 226). 3rd-6th Grade/7th Grade: Reflects on the security of data shared on the internet and social media (ANEP, 2023b: 463). 6th Grade: Identifies different moments of the day and night for activities where screen use is essential and others where it is not (ANEP, 2023b: 229).	Starting Point: Write a "media biography" to identify the challenges and opportunities offered by ICT. MIL Activity 1: Analyze the routine and habits related to screen use and content consumption. MIL Activity 2: Reflect on the concept of "digital identity" and identify necessary measures for the protection of personal data online. Closing Activity: Reflect on the curricular integration of MIL, considering its challenges and possibilities.

Source: Created by the author using information from ANEP (ANEP, 2023a) and ANEP (ANEP, 2023b)

Implementation.The technopedagogical experience was offered as an online course, and teachers were invited via social media and through various institutions such as Centro Ceibal, a public institution in Uruguay that manages and implements the Ceibal Plan, which aims to democratize access to technology in education by promoting the integration of digital tools in teaching (Centro Ceibal, 2023). A total of 61 responses were collected through the registration form, and 33 teachers (28 women and 5 men) from primary, secondary, and high school levels attended and completed the course. The participants came from ten departments of the country: Canelones, Cerro Largo, Colonia, Lavalleja, Maldonado, Montevideo, Río Negro, Rivera, Soriano, and Tacuarembó. The sessions were held over two consecutive Saturdays in August and September 2024.

Evaluation. The responses to the activities and the final questionnaire (Appendix A), as well as the dialogues generated during the synchronous online sessions, were collected as data, with the participants' consent. This data was categorized into four dimensions: a) *curricular space*, which analyzes the adequacy of MIL in the subjects where it is integrated; b) *concept and scope*, which determines the teachers' understanding of what MIL is and its importance; c) *key actors and resources*, which identifies who the main responsible parties and participants are in the implementation of MIL, , as well as the resources available for its instruction; and e) challenges and opportunities. The data was organized in an Excel sheet, and the graphs were created using Tableau software.

To ensure the transparency of the study, supplementary material is provided on Figshare, which includes the dataset produced in this research: https://figshare.com/s/3e679c80552245a0b1b3

3. Discussion

Turín and Friedman (Friedman, 2019) identify "passionate teachers" as the primary catalysts for the integration of MIL within educational systems. These educators demonstrate strong commitment and initiative by independently incorporating ICT into their classrooms, fully aware of the significant changes these technologies have brought to their teaching practices and the environments in which their students learn. As noted by Gennaro et al. (Gennaro et al., 2024), this effort is often made without institutional support and can be viewed as a form of activism. Despite facing various challenges, these educators effectively inspire and mobilize their educational communities.

In this context, the formal integration of MIL into educational curricula requires decision-makers to establish the necessary conditions for effective instruction (Hobbs et al., 2022). However, research conducted across various contexts indicates that, despite MIL being designated as a subject or included in official documents and legislation, teacher training in this area remains a significant challenge, as does the development of appropriate teaching materials for its instruction (Kajimoto et al., 2020; Rojas-Estrada et al., 2023; Zhang et al., 2020). Furthermore, teachers' understanding of MIL principles often remains inadequate, frequently reducing the concept to a narrow focus solely on the use of digital devices, journalism, or advertising (Azizi et al., 2021; Brosch, 2017). This issue largely arises from the top-down formulation of educational policies, where educators frequently lack opportunities to voice their opinions and perspectives, or where such education is implemented without appropriate prior assessment (UNESCO, 2021).

According to the study by Mateus et al. (Mateus et al., 2021), which evaluated teachers' perceptions in Argentina, Ecuador, Chile, and Peru regarding media education, educators acknowledge the need for training that transcends the merely instrumental use of technology. They observe that, while many students demonstrate skills in content production, they often lack basic and critical competencies, such as the ability to write an email appropriately. Moreover, teachers express concerns about deficiencies in infrastructure and resources, which hinder the effective teaching of these contents within their respective contexts. In this context, both the study conducted by Silva et al. (Silva et al., 2016) and the doctoral thesis by Durán-Becerra (Durán-Becerra, 2016) emphasize the limited number of studies on this subject in Uruguay. This is notable given the country's status as a regional leader in policies promoting the integration of ICT in education, particularly through the Ceibal Plan, which stands out as one of its main initiatives. Launched in 2007, this macro-policy has been instrumental in distributing devices and digital resources to students and teachers, ensuring equitable access to technology while also encouraging its pedagogical application (De-María, Bartesaghi, 2023). Thus, investigating teachers' perceptions regarding the explicit incorporation of MIL becomes increasingly relevant.

4. Results

Concept and Scope

In the initial survey, teachers were asked about their familiarity with the concept of MIL, and 62.3 % indicated that they were not familiar with the concept at that time. Following the educational experience, participants were requested to define the concept of MIL, and they described it as a "process", "capacity", or "tool" for developing skills that enable students to critically analyze information and use ICT responsibly and safely.

In this context, 93 % of teachers expressed a positive perception regarding the integration of MIL in the curriculum, recognizing its relevance and the necessity of its incorporation. However, MIL is predominantly viewed as a "preventive" resource to address the emerging challenges of the media ecosystem. Teachers, in particular, expressed concern about phenomena such as misinformation, cybercrime, and screen addiction affecting children and adolescents, identifying these issues as key motivations for their teaching. The remaining 7 % considered the integration to be moderately positive, noting that, despite its relevance, they perceive challenges in its implementation and impact.

Masculine [Canelones], 7th grade: "The benefits of these contents will be clearer if adequate resources are provided, and we are well-prepared".

Feminine [Montevideo], 9th grade: "I believe that the integration of Media and Information Literacy is a step in the right direction, although I think its impact will largely depend on how it is implemented. If done well, it could be beneficial for students and for the school in general, although it is a process that will require time".

Feminine [Tacuarembó], 9th grade: "I value the integration of MIL because it is relevant in the current context. However, I also think that the integration may be excessive for students".

Regarding the motivations for this integration, there is a predominant perception that a measure has been implemented to safeguard students against the risks associated with the use of ICT and the influence of the media:

Female [Canelones], 8th, 9th grade: "I consider it important and highly positive to provide children and adolescents with tools to confront these dangers, as they are constantly exposed to social media without prior experience regarding the threats present".

Female [Lavalleja], High School: "I see it as a positive fact, as they possess knowledge on the subject and help us acquire tools and resources to work with our students, preventing misinformation".

On the other hand, teachers indicate that this integration responds to the omnipresence of ICT and the information overload faced by contemporary society. They also attribute this measure to the curricular reform initiated in 2023, aimed at aligning the educational system with the realities experienced by students. Some teachers highlight that the objective of AMI is to prepare students to face the challenges of the labor environment, while others consider that this integration seeks to "transform" classroom dynamics or align with international educational trends.

Regarding the dimension of the curricular space, teachers were asked to indicate the most appropriate grades for teaching objectives associated with AMI identified in the analysis phase (Rojas-Estrada et al., 2024). The analysis reveals a set of objectives considered relevant for development from early education to secondary education, with a particular emphasis on digital well-being and the promotion of responsible attitudes (Table 2). Among these objectives are: a) identifying technological advancements and their impact; b) teaching online conduct norms; c) detecting harmful digital behaviors; d) fostering collaboration in digital environments; e) expressing oneself through audiovisual productions; and f) reflecting on screen addiction and the impact of social media.

Curricular space

Furthermore, teachers have identified a set of objectives that are more suitable for instruction in the later grades of primary education and, to a greater extent, in secondary education. These objectives address the use of artificial intelligence and algorithms, critical analysis of information and media content, understanding of visual and digital languages in productions, and proper attribution of citations and credits when using information from third parties. It is noteworthy that some teachers believe these objectives are not suitable for inclusion in basic education. One possible explanation for this viewpoint is the perception that the age of students at this stage poses a significant limitation:

Female [Montevideo], 2nd grade: "The greatest challenge is the age of the children; they are young".

Female [Tacuarembó], 1st grade: "They are small children, and it is necessary to seek various strategies for this".

Table 2. Teacher perspectives on teaching objectives associated with MIL by grade

Objective	*EE*	**1°**	**2°**	**3°**	**4°**	**5°**	**6°**	**7°**	**8°**	**9°**	**X**
The ability to identify technological advances in the environment and evaluate their impact in various spheres, from everyday life to socioeconomic aspects.	17	21	21	20	21	25	28	22	22	22	
Active collaboration in digital environments, recognizing the value of	16	19	19	21	21	21	23	22	23	23	

teamwork and collaborative interaction as essential components for holistic development.											
The evaluation of the use of algorithms and artificial intelligence in various contexts.	3	7	8	10	15	16	18	16	18	17	4
The ability to search for and select information from various digital sources, learning to identify relevant data and its validity.	7	10	12	16	19	20	24	24	24	23	
Organizing and storing information in various digital formats, including the creation and management of databases.	6	11	10	14	15	18	24	23	23	24	
Incorporating citations, references from sources, and credits, selecting relevant and reliable information.	3	3	5	9	11	12	17	20	20	22	3
The ability to identify, analyze, and understand visual elements present in various artistic and media productions.	8	11	14	14	16	17	21	21	21	20	1
The ability to express ideas, emotions, and perceptions through various visual and digital languages.	17	18	17	18	20	21	22	23	22	22	1
Teaching basic norms of online behavior.	20	25	25	27	28	30	30	26	25	24	
Detecting harmful and risky behaviors in digital environments.	22	22	23	26	26	27	29	27	27	26	
Promoting civic engagement in solving local problems through the use of ICT.	11	13	14	16	17	18	24	25	26	27	
Reflecting on screen addiction, the influence of social networks on self-esteem, and interpersonal relationships, to develop strategies that contribute to maintaining a healthy balance between digital life and real life.	17	17	17	18	18	20	23	24	25	26	
The ability to critically analyze messages and stereotypes conveyed by the media	2	6	6	10	10	13	19	18	20	21	4
Promoting the exchange of local linguistic and audiovisual productions as a way to highlight and value cultural aspects.	8	9	8	13	13	15	21	18	21	22	3

Notes: *EE*= Early education/X=It should not be taught in basic education.

Key actors

In response to inquiries regarding the involvement of various key actors in promoting the teaching of content related to MIL for children and adolescents in Uruguay, teachers have identified the Ceibal Center as the most engaged actor (Figure 1). During the formative experience, teachers highlighted it as a provider of resources and equipment, as well as the creator of educational platforms used in classrooms. Furthermore, the Ceibal Center has been recognized as a space where teachers have accessed training on topics related to digital education.

Secondly, universities, media and communication experts, and international organizations were mentioned as significant contributors. In contrast, school administrators and parents or guardians were considered less involved compared to the aforementioned actors. However, some teachers emphasize that parents should receive more training to complement the teaching of MIL at home, rather than restricting it solely to the school environment.

Female [Montevideo], 7th, 8th grade: "However, sometimes parents are not well-informed about how to support their children in this area".

Female [Canelones], 7th, 8th, 9th grade: "Media literacy cannot be solely the responsibility of the school; it is crucial that families get involved".

Another group whose involvement is perceived as limited consists of media companies. However, some teachers have identified Fundación Telefónica as an exception, acknowledging it as an organization that offers training opportunities.

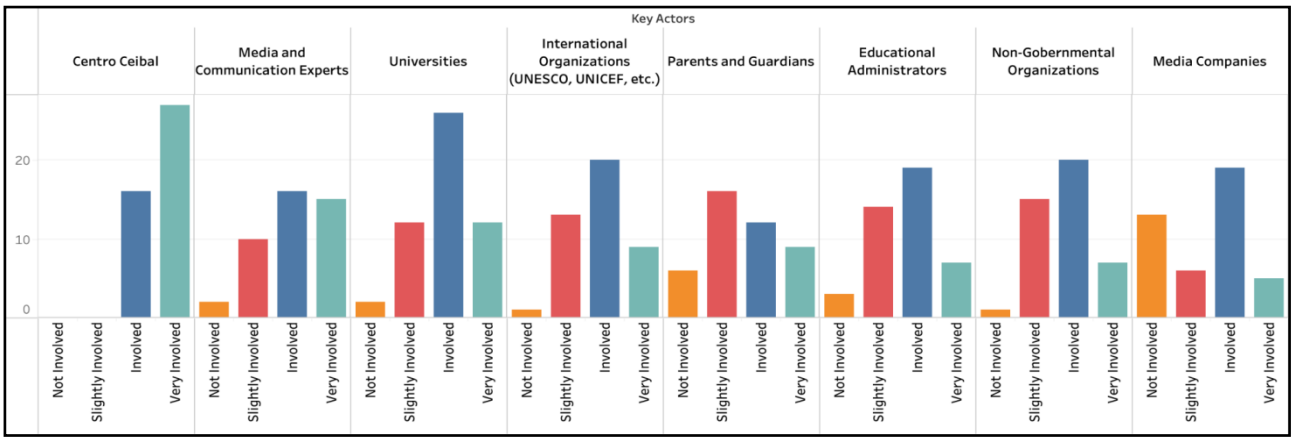

Fig. 1. Involvement of key stakeholders

Resources and Teacher Training

Regarding the technological resources available for teaching MIL, most teachers reported having access to electronic devices such as tablets, computers, and internet connectivity. Some teachers also highlighted the provision of technological equipment by the Centro Ceibal, which supplies materials such as "robotics kits" and various platforms like "ALEKS" for teaching mathematics. Additionally, they mentioned the use of student textbooks that include texts prompting reflection on "information, sources, interactions on social networks" (Female [Canelones], Support Teacher). Nevertheless, the responses indicate a widespread need for more specific MIL resources and the lack of suitable materials for certain educational levels, underscoring the need for more resources adapted to younger age groups.

Male [Cerro Largo], 9th grade: "I believe it would be very useful to have more specific resources, such as updated teaching guides on media literacy and educational software that facilitates the assessment of digital skills".

Female [Canelones], 3rd grade, Community Teacher: "I frequently use the tools provided by Ceibal, such as digital platforms. However, I think it would be great to have more specific resources, like apps that teach younger students how to identify fake news".

In addition to devices, several teachers utilize online educational platforms such as *Mentimeter* and *Kahoot*, which they believe allow them to implement interactive activities and reinforce key concepts in their classes. Others emphasize the value of audiovisual content, including videos, documentaries, songs, and series, citing specific episodes of programs like *Black Mirror* that can be useful for discussing the effects of technology with adolescents. Furthermore,

the use of academic articles and teaching guides available online is highlighted, as these resources enable educators to introduce students to these topics.

Another aspect considered a fundamental resource is teacher training. In this context, there is a widespread demand for more robust continuous professional development, both in the use of technology and in teaching critical processes for analyzing media content. Notably, teachers from the "rural areas", outside the capital, indicate that this need is even more pronounced in their institutions.

On the other hand, the participants were asked whether they had received specific training or professional development to teach the content addressed in the experience. Of the 43 participants, 34 indicated that they had not received such training and that the designed experience was the first in which they participated. However, two teachers (Male [Colonia], 9th grade / Male [Montevideo], 7th, 8th, High School) mentioned that, despite their desire to gain knowledge in the subject, they do not have the necessary time to do so. On the other hand, among the teachers who responded affirmatively, two noted that, although they have not participated in specific AMI courses, they have attended courses focused on the use of digital platforms in the educational field.

Male [Lavalleja], 7th, 8th, 9th grade: "I have attended workshops offered by Ceibal that cover the use of devices and educational platforms".

Female [Canelones], 3rd grade, Community Teacher: "Yes. The training focused on the general use of educational technologies".

In this context, it has been documented that they have undertaken specializations, courses, and participated in self-initiated activities in three specific areas: a) the Technological University (UTEC); b) the Telefónica Foundation in collaboration with La Caixa Foundation through the ProFuturo platform, which is part of a digital education program (Fundación Telefónica, 2024); and c) the Ceibal Center, through the Edux platform, which offers a wide catalog of massive online courses (Ceibal, 2024).

Female [Montevideo], 2nd grade: "I have previously participated in training at Edux on topics such as the positive uses of technology and virtual teaching. I have also attended workshops on cyberbullying and read articles in specialized journals on primary education".

Female [Montevideo], 9th grade: "The closest experience I have is a specialization in educational technology at UTEC".

Female [Lavalleja], High School (1st EMS-5th, 6th): "Yes, I have received training on this matter; this instance is part of it, as mentioned in the various responses to this survey. Additionally, I have previously attended workshops on digital wellbeing (offered by UTEC), and I have taken training courses and postgraduate programs provided by Ceibal and the Global Learning Network on environments for teaching and learning in multimodal contexts, as well as on digital citizenship, offered by the same platform or ProFuturo".

Challenges and Opportunities

As illustrated in Figure 2, the lack of familiarity with the term "Media and Information Literacy" emerges as the most frequently noted challenge in the responses. From the teachers' perspective, this unfamiliarity diminishes the perception of its "importance". Secondly, participants highlight the lack of adequate training as a significant barrier to the effective teaching of MIL. One teacher noted that this deficiency limits educators' ability to address content with the necessary "competence" and "confidence". In this context, there is a clear demand for practical courses, regular workshops, and updated training programs that enable educators to: a) stay informed about the latest trends and methodologies in MIL; b) access concrete examples applicable in the classroom; and c) develop strategies for teaching young children in early educational stages.

In this category, suggestions are made to overcome this challenge, such as providing resources that clarify the relationship between MIL and other familiar concepts, such as "digital skills" and "digital citizenship". Additionally, a geography and history teacher (Male [Lavalleja], 7th, 8th, 9th grade) emphasizes the need for specific materials tailored to each subject. In this context, another teacher notes that interdisciplinary projects represent an opportunity, although she expresses concern about her colleagues' willingness to implement them:

Female [Rivera], 8th grade: "Interdisciplinary projects, but perhaps other teachers may not want to engage with the topic. I understand that I can address it across different subjects, but I don't believe there will be a willingness to collaboratively create resources".

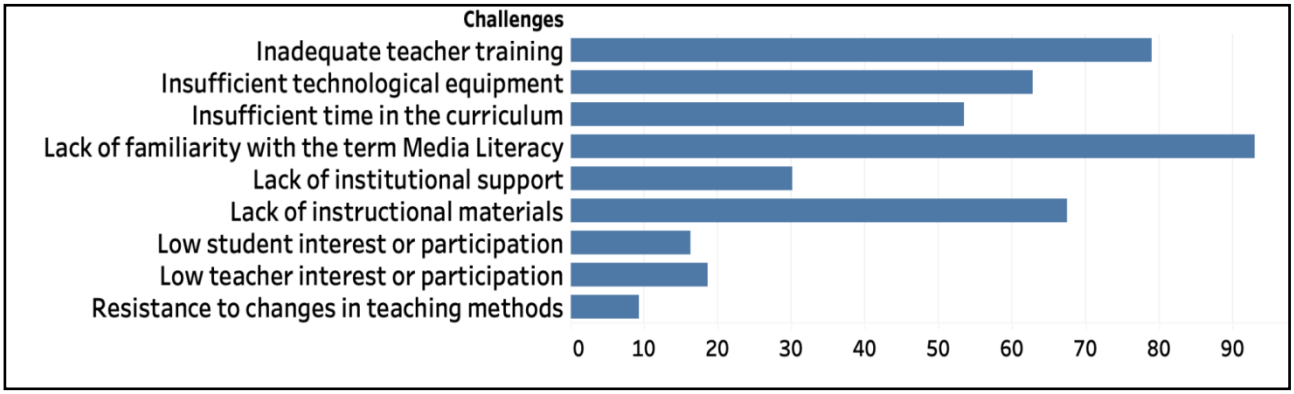

Fig. 2. Challenges Identified by Teachers Regarding the Curricular Integration of MIL

A second group of challenges includes the insufficiency of technological devices, the limited curricular time allocated for teaching MIL, and the lack of institutional support. A teacher (Female [Canelones], 5th grade) points out that this latter factor could create opportunities for awareness-raising, facilitating the implementation of "comprehensive" strategies that engage the entire school community, enabling students to understand the relevance of these contents. Furthermore, two teachers (Female [Montevideo], 9th grade / Female [Montevideo], 7th, 8th grade) underscore the importance of collaboration between educational authorities and school administrators to establish a support network that, firstly, allows school leaders to become familiar with the concept and, secondly, creates the necessary conditions for its teaching. To a lesser extent, participants also identify the lack of interest from both teachers and students, as well as resistance to changes in teaching methods, as challenges.

Finally, three teachers (Female [Montevideo], 7th, 9th grade / Female [Soriano], 7th, 8th, 9th grade/Male [Canelones], 7th grade) believe that the involvement of families and the community is a fundamental component for the effective implementation of MIL. For this reason, they recommend promoting workshops and orientation sessions for parents, so they can support their children in the responsible use of ICT.

5. Conclusion

The aim of this experience has been to analyze teachers' perceptions of the curricular integration of MIL in Uruguay. After conducting this intervention, three key points emerge that must be considered for the implementation of this educational policy:

Addressing the terminological dispersion when presenting this type of education is fundamental. The lack of familiarity that participants exhibited regarding the concept of MIL, combined with the variety of terms used in the educational field to refer to these contents, such as "digital skills" or "digital citizenship", has also been identified as a phenomenon within the educational curriculum (Competencia mediática, 2024). This situation can negatively impact curricular coherence, the quality of teacher training, and the effectiveness of teaching media competencies (Brosch, 2017). For example, one teacher may focus on the technical use of devices, while another may prioritize the production of digital content without developing critical evaluation skills for information. In this sense, it is crucial to consider that, in addition to its inclusion in the texts that underpin the curricular proposal, its conceptualization and the actions aligned with its implementation must be a shared responsibility among other ministries and state entities (Ptaszek, Lysik, 2019).

MIL is not merely a "preventive resource". It is essential to consider the preventive or inoculative approach that accompanies the treatment of these contents by educators, as this perspective may overlook the opportunities that MIL provides. Instead of fostering a "critical distancing" from ICT, as suggested by Ferrés (Ferrés, 2014), this approach could lead to efforts to protect students from such technologies. According to Rahm (Rahm, 2021), this conception can also lead educators to perceive their students solely as individuals susceptible to manipulation, dismissing their potential as active participants in the digital public sphere. Therefore, as suggested by Neag et al. (Neag et al., 2022), any training proposal in MIL directed at educators must address the imaginaries surrounding ICT in education.

The Ceibal Center is a key entity in promoting these contents. It is positive that, from the educators' perspective, this institution fosters a space for training and resource development to achieve the goal of cultivating digital citizens. Among its main initiatives are the provision of devices and connectivity for students and teachers, as well as promoting responsible technology use through its Digital Citizenship program (Centro Ceibal, 2023). Therefore, any action aimed at encouraging the integration of MIL in educational and socio-community settings must consider the importance of collaborative work with this entity.

Additionally, it is essential to consider that, in order to transcend the treatment of MIL as a "well-intentioned slogan" (Buckingham, 2020: 237), it is necessary for various key actors to work together and establish a comprehensive strategy for its promotion and implementation that is not limited solely to the school context. The inclusion of MIL in the curriculum represents a first step in a chain of decisions and policies that must align across areas such as telecommunications and culture, with the goal of cultivating more informed, creative, and critical citizens regarding what they consume and produce in the digital world.

Regarding the limitations of this study, it is important to note that it represents a preliminary approach to the perception of Uruguayan teachers concerning the integration of MIL. While it offers an initial view, it does not delve deeply into how these contents are concretely implemented in classrooms. Furthermore, the primary focus is on the educators' perspective, so it would be beneficial to expand the analysis to other key groups, such as students, parents, school administrators, and representatives of civil society. This would help advance towards an effective integration of MIL, ensuring that all actors involved in the educational process can contribute to its implementation.

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Appendix A

Structure of the final form for the technopedagogical experience

Dimension	*Questions*
Concept and Scope	1. In your own words, how would you define Media and Information Literacy (MIL)? 2. Before this course, were you aware that MIL is mentioned in the Integrated Basic Education Study Plan? 3. How do you evaluate the fact that MIL has been integrated into the Integrated Basic Education curriculum? 1: Positive 2: Moderately positive 3: Moderately negative 4: Negative 4. Why do you value the integration of MIL in the curriculum in that way? Justify your previous response. 5. From your perspective, what do you think were the main reasons for integrating the content associated with MIL into the curriculum?
Curricular Space	6. In which grade(s) do you think the following learning objectives should be taught? (You can select all applicable options (grades) for each objective) ● The ability to identify technological advancements in the environment and assess their impact in various spheres, from daily life to socioeconomic aspects. ● Active collaboration in digital environments, recognizing the value of teamwork and collaborative interaction as essential components for integral development. ● Evaluating the use of algorithms and artificial intelligence in various contexts. ● The ability to search for and select information from various digital sources, learning to identify relevant data and its validity. ● Recognizing, selecting, and using various digital tools to interpret data and retrieve information. ● Organizing and storing information in various digital formats, including creating and managing databases. ● The ability to identify, analyze, and understand visual elements present in various artistic and media productions.

	● The ability to express ideas, emotions, and perceptions through different visual and digital languages. ● Teaching basic online behavior norms. ● Detecting harmful and risky behaviors in digital environments. ● Promoting civic engagement in solving local problems through the use of ICT. ● Reflecting on screen addiction, the influence of social networks on self-esteem, and interpersonal relationships to develop strategies that contribute to maintaining a healthy balance between digital life and real life. ● The ability to critically analyze messages and stereotypes conveyed by the media. Promoting the exchange of local linguistic and audiovisual productions as a way to highlight and value cultural aspects.
Resources and Key Actors	7. From your experience, what resources do you currently have to teach content associated with MIL? What other resources do you consider necessary? 8. From your perspective, how involved do you think the following key actors are in supporting or promoting the teaching of content associated with MIL to children and adolescents in Uruguay? (Mark the level of involvement of each actor on a scale of 1 to 4, where 1 means "Not involved at all" and 4 means "Very involved") ● Educational Administrators ● Parents and Guardians ● Non-Governmental Organizations (NGOs) ● Media and Communication Experts ● Media Companies ● Ceibal Center ● Universities ● International Organizations (UNESCO, UNICEF, etc.)
Challenges and Opportunities	9. From your perspective, what are the greatest challenges facing the teaching of content associated with MIL? ● Lack of teaching materials ● Lack of technological equipment ● Insufficient training for teachers ● Lack of knowledge about the term ● Resistance to change in teaching methods ● Lack of time in the curriculum ● Little interest or participation from students ● Little interest or participation from teachers ● Lack of institutional support ● Others (please specify) 10. What additional support or measures do you consider necessary to overcome the challenges you identified in the previous question?

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Attitudes, Perceptions, and Challenges Towards Artificial Intelligence Adoption in Ghana and Nigeria: A Systematic Review with a Narrative Synthesis

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Abstract

Artificial Intelligence (AI) is increasingly pivotal in driving global economic growth and technological advancement. However, there is a significant disparity in AI adoption, particularly in Ghana and Nigeria, where unique opportunities and challenges exist for integrating AI technologies. This paper aims to synthesise current literature on attitudes towards AI in Ghana and Nigeria, examining awareness levels, perceptions, and factors influencing AI adoption across various sectors. A systematic search was conducted using PubMed, Scopus, Medline, and Google Scholar databases. Following inclusion criteria and study objectives, 28 published articles from 2000 to 2023 were included in this narrative review. We found that attitudes towards AI in Ghana and Nigeria vary across sectors and demographics. There is generally a positive perception in education and healthcare, with high enthusiasm for AI's potential benefits. However, scepticism persists, particularly in financial sectors, due to security concerns. Key factors influencing AI perceptions include trust, social influence, and perceived usefulness. Challenges to AI adoption include limited infrastructure, insufficient technical expertise, and varying digital literacy levels, especially in rural areas. While enthusiasm for AI exists in Sub-Saharan Africa, particularly in education and healthcare, significant challenges remain. Policymakers must focus on developing comprehensive AI strategies that enhance digital infrastructure, integrate AI education, establish appropriate regulatory frameworks, and encourage public-private partnerships to foster responsible AI adoption aligned with local needs and development goals.

Keywords: artificial intelligence, attitudes, perceptions, technology adoption, Ghana, nigeria, systematic review.

1. Introduction

Artificial intelligence (AI) is increasingly pivotal in driving economic growth, technological advancement, and social transformation globally (Qin et al., 2023). Generally, AI encompasses technologies such as machine learning, natural language processing, and robotics, which enhance machines' abilities to perform tasks requiring human intelligence (Soori et al., 2023). Despite global enthusiasm, there is a significant disparity in AI adoption, particularly in Sub-Saharan Africa (Ade-Ibijola, Okonkwo, 2023). This region presents unique opportunities and challenges for integrating AI technologies, influenced by cultural, educational, and economic factors (Ade-Ibijola, Okonkwo, 2023). Understanding attitudes towards AI in Sub-Saharan Africa, specifically in growing digital economies like Ghana and Nigeria, is essential for formulating effective policies to harness

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AI's potential for sustainable development (Adigwe et al., 2024; Bello et al., 2023; Edzie et al.,2023; Eiriemiokhale et al., 2023; Ibrahim et al.,2024; Muhammad et al.,2023; Uzir et al., 2023).

Ghana and Nigeria's engagement with AI, like several Sub-Saharan African countries, is shaped by a combination of technological infrastructure, educational levels, and governmental policies (Ade-Ibijola, Okonkwo, 2023; Eiriemiokhale et al., 2023; Ibrahim et al.,2024; Muhammad et al.,2023; Uzir et al., 2023). Despite a burgeoning digital landscape, these countries face significant challenges, including limited access to high-quality data, insufficient technical expertise, and underdeveloped infrastructure (Ahmed et al., 2023; Muhammad et al., 2023; Uzir et al., 2023). These hurdles impede the widespread adoption of AI technologies. Moreover, public perception and acceptance of AI are critical to its successful implementation (Baidoo-Anu et al., 2024; Gerlich, 2023; Mustapha et al., 2024; Nyarko, 2024; Uzir et al., 2023). Attitudes towards AI range from optimism about its potential to drive economic growth and solve local problems to concerns about job displacement, privacy issues, and ethical implications (Ade-Ibijola, Okonkwo, 2023; Suleiman, 2024). For instance, in countries like Nigeria, there is growing enthusiasm for AI-driven solutions in agriculture and healthcare (Ade-Ibijola, Okonkwo, 2023). However, scepticism remains prevalent, particularly in rural areas where digital literacy is low and fears about AI replacing human jobs are high (Aderibigbe et al., 2023; Ogolodom et al., 2023). Examining the attitudes of various stakeholders, including policymakers, educators, entrepreneurs, and the general populace, is imperative for fostering an environment conducive to AI innovation. Policymakers must navigate these attitudes carefully to create supportive regulatory frameworks, while educators and entrepreneurs need to address both the opportunities and concerns associated with AI.

Notwithstanding these concerns, positive attitudes towards AI correlate with its successful adoption and integration into society (Cao et al., 2021). In developed countries, research has shown that awareness and education about AI significantly contribute to a more favourable disposition towards its use across various sectors, such as healthcare, education, and finance (Fadel et al., 2019). Sub-Saharan Africa's diverse cultural landscape and varying levels of economic development necessitate a tailored approach. In this region, the perception of AI can vary widely depending on local contexts, such as urban versus rural settings or countries with different stages of technological advancement (Ade-Ibijola, Okonkwo, 2023). Addressing these varied perceptions requires targeted awareness campaigns, education programs, and policy initiatives that resonate with local realities. Thus, a nuanced understanding of regional attitudes towards AI is crucial for devising strategies that promote its acceptance and effective utilisation.

Besides, the literature emphasizes contextualising AI to local needs, involving technological adaptation and fostering a positive societal outlook (Alhosani,Alhashmi, 2024). Previous studies in Sub-Saharan Africa highlight AI's potential to address critical issues like healthcare delivery, agricultural productivity, and educational access (Kudama et al., 2021; Owoyemi et al., 2020). The success of these initiatives depends on prevailing attitudes towards technology. Thus, this systematic review aims to synthesise existing evidence on attitudes towards AI in Ghana and Nigeria, identifying key attitudes, perceptions, and challenges to inform policymakers, researchers, and practitioners in promoting AI for sustainable development in the region.

2. Material and methods

Systematic Review Approach

This study adopted a systematic review approach, employing the narrative synthesis method as described by Popay et al. (2006). The focus was on identifying, extracting, and synthesizing data related to artificial intelligence (AI), knowledge, and awareness in sub-Saharan Africa.

Literature Search Strategy

A comprehensive literature search was conducted across several major databases, including PubMed, Scopus, and Medline, using a combination of search terms such as "Artificial Intelligence," "AI," "Knowledge," "Awareness," "Understanding," "Attitude," and "Perceptions." An additional search was performed on Google Scholar to capture studies that were not indexed in the primary databases. The search was confined to studies conducted in Ghana and Nigeria, published in English, and spanning the period from January 2000 to July 2024. Studies conducted outside these countries, in languages other than English, or before 2000 were excluded.

Study Selection and Data Extraction

After the initial search, reference lists of relevant systematic reviews were screened to identify additional studies that met the inclusion criteria. A total of 28 studies were selected for inclusion in this review. Data extraction was conducted by two authors (EKA and PM) using a standardised Microsoft Excel template under the supervision of JOS. To ensure accuracy and comprehensiveness, GT-D, a chartered librarian and expert in information science, provided technical support and performed an expert review of the extracted data and themes.

Data Categorisation and Synthesis

The studies were systematically categorized into coherent themes or groups, facilitating a structured analysis. The narrative synthesis process involved an in-depth exploration of the findings within each category, examining the interrelationships and identifying potential sources of variation among the studies. This iterative process led to the identification of overarching themes, contributing to a holistic understanding of attitudes toward artificial intelligence in sub-Saharan Africa. A detailed search strategy is provided in Table 1, and the record screening process is illustrated in Figure 1.

Quality Assessment

We assessed the quality of the included studies using simple criteria based on appropriate and published checklists (Page et al., 2018). We assessed the studies on their methodologies and their interpretations of findings. Additionally, the quality of the included studies was rigorously assessed using an enhanced framework based on well-established checklists by the Critical Appraisal Skills Programme (Long et al., 2020; Singh, 2013). This assessment involved evaluating the methodological rigour, reliability, and validity of each study. Specific criteria included the clarity of research objectives, appropriateness of study design, sampling methods, data collection techniques, and the robustness of data analysis. Additionally, the relevance and transferability of the findings to the broader context of attitudes, perceptions, and challenges facing AI use in Ghana and Nigeria were considered. All discrepancies in the quality assessment were resolved through discussion meetings among the reviewers, ensuring consistency in the evaluation process.

Ethical Considerations

This study was part of a larger research project that received ethical approval from the Institutional Review Board of the University of Cape Coast (ID: UCCIRB/EXT/2023/56). All sources were properly cited, and the review adhered to strict standards of academic integrity and transparency throughout the process.

Table 1. Search Strategy for Articles on Attitudes towards artificial intelligence in Ghana and Nigeria

Search strategy item	Search strategy
Databases	PubMed, Scopus, Medline, Google Scholar
Language filter	English Language
Time filter	2000–2024
Spatial filter	"Ghana" OR "Nigeria"
Keywords	1. "Artificial Intelligence" OR "AI" 2. "Knowledge" OR "Awareness" OR "Understanding" 3. "Attitude" OR “Perceptions" 4. "Challenges" OR “Concerns” OR “Apprehensions” OR “perceived risks”
Inclusion criteria	The paper should be: 1. A peer-reviewed or grey literature 2. A published paper from 2000 and later 3. Conducted in Ghana and Nigeria 4. Published in the English language 5. Conducted amongst various age groups 6. Knowledge, awareness, attitudes and perceptions of Artificial Intelligence amongst Sub-Saharan Africans.
Exclusion criteria	The paper should be: 1. Conducted in countries outside Ghana and Nigeria 2. A study published online before the 2000

Search strategy item	Search strategy
	3. A report, review, abstract, minutes, commentary, letter to editors, preprint, literature reviews 4. Outside the variables of interest

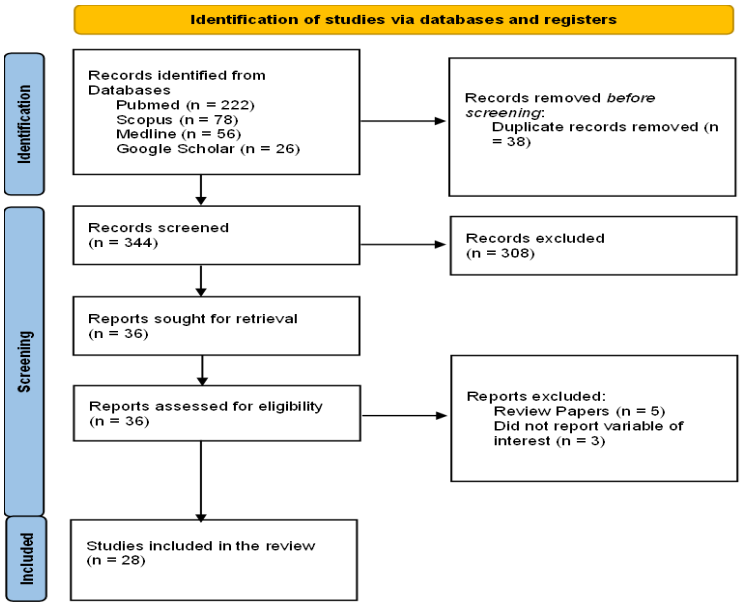

Fig. 1. PRISMA Flow Chart of the Record Screening Process

3. Results

Initial Findings

This review includes twenty-eightpublished articles. The majority of the papers used the quantitative approach with approximately 57% of the studies were conducted in Nigeria. See Figures 2, 3, Tables 2, 3 for further details.

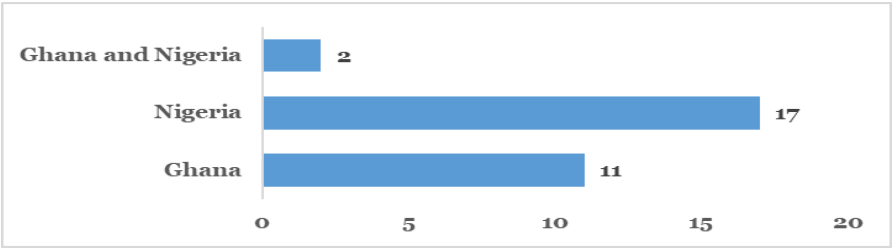

Fig. 2. Geographical Distribution of Studies

Table 2. Organisation of Themes: Attitudes towards AI

Major Themes	Author(s) and year
Attitudes and perceptions towards AI	(Adamu et al, 2020; Adelana, Akinyemi, 2021; Botwe et al., 2021; Ayanwale et al., 2022; Akinmoladun et al., 2022; Salifu et al., 2023; Adarkwah et al., 2023; Nja et al., 2023; Bello et al., 2023; Eiriemiokhale et al., 2023; Edzie et al., 2023; Muhammad et al.,2023; Uzir et al., 2023; Adigwe et al., 2024; Ibrahim et al., 2024; Rueben, Kabilan, 2024; Daniel et al., 2024; Omolo,Fasina, 2020; Suleiman, 2024; Baidoo-Anu et al., 2024; Mustapha et al., 2024; Nyarko, 2024; Ofosu-Ampong, 2023; Ogolodom et al., 2023)
Challenges influencing AI adoptions	(Adarkwah et al., 2023; Adigwe et al., 2024; Akinmoladun et al., 2022; Aminu, 2024; Botwe et al., 2021; Ejikrm et al., 2022; Jibril et al., 2024; Mohammed, 2023; Muhammad et al., 2023; Ogolodom et al., 2023)

Summary of Findings on Attitudes, Perceptions, and Challenges towards AI in Ghana and Nigeria

As indicated in Table 3, our systematic review included 28 studies. All studies included assessments of the attitudes and perceptions of participants towards AI use in education, health care and its delivery, journalism, economic mobility, agriculture, construction industry, media, and banking sectors. For most studies that centred on AI and education, there is a high level of awareness of AI, with positive attitudes towards it (Adarkwah et al., 2023; Eiriemiokhale et al., 2023; Rueben, Kabilan, 2024; Sani, 2024).

Regarding the attitudes and perceptions, Adamu et al. (2020) concluded that their population, which consisted of teachers in technical and vocational fields, is highly proficient in using digital tools. Adelana and Akinyemi (2021) revealed that the students were aware of the existence of AI and were ready to adopt AI-based tutoring systems for learning in senior secondary schools. Salifu et al. (2023) reported that Economics students at the University of Cape Coast saw artificial intelligence, particularly ChatGPT, as a valuable tool for enhancing learning and providing quick, individualised help. It was found that factors like perceived trust, social influence, and hedonic motivation significantly drive students' behavioural intentions to use AI tools (Salfiu et al., 2023).

Furthermore, studies like Mohammed (2023) reported that the educators who participated in the study perceive AI as vital for enhancing teaching and learning experiences. In pinpointing variables affecting the effective usage of AI by science teachers, the science teachers showed a high level of approval of the utilisation of AI during teaching and learning. Ogqo et al. (2023) concluded that applications of AI in academic libraries have the potential to increase productivity and overall operational effectiveness. The paper also revealed that poor ICT skills and technical expertise, high initial costs of implementation, phobia of job displacement, epileptic power supply, poor maintenance culture, resistance to change, poor network connectivity, privacy and ethical implications etc. were some challenges to AI faced by academic libraries in Nigeria.

Table 3. Summary of Studies Included (n = 28)

Author, Year, Country	Purpose	Methodology/ Design	Sample	Sector	Attitudes and Perceptions	Challenges
Adamu et al. (2020)/ Nigeria	To investigate the competencies required by technical and vocational teachers towards computer and related technology for classroom teaching and learning	Cross-sectional survey	TVE teachers	Education	Teachers in technical and vocational fields are highly proficient in using digital tools, with a strong relationship between competence and teaching experience and a weaker relationship between competence and gender.	
Adelana and Akinyemi (2021)/ Nigeria	To examine students' awareness and readiness to adopt the system for learning.	Quantitative approach, Descriptive survey design of non-experimental type	304 students	Education	Students are aware of and ready to adopt artificial intelligence-based tutoring systems for learning in senior secondary schools.	There was no significant difference between senior secondary students' level of awareness and readiness to adopt AI-based Tutoring Systems for learning across gender, class, and subject specialisation.

Author, Year, Country	Purpose	Methodology/ Design	Sample	Sector	Attitudes and Perceptions	Challenges
Botwe et al. (2021)/ Ghana	To explore Ghanaian radiographers' perspectives on the integration of AI into medical imaging.	Quantitative approach, cross-sectional online survey	151 radiographers	Health	Majority agreed that AI technology is the future of medical imaging. Most of them pointed out that AI would have an overall positive impact on medical imaging practice. Negative attitudes included fears about AI-related errors and concerns relating to job security.	High equipment costs, lack of knowledge, and fear of cyber threats were identified as factors hindering AI implementation in Ghana.
Ejikem et al. (2022)/ Nigeria	To explore the perspectives of anesthesiologists in Nigeria on the use of AI in their practice	Cross-sectional survey	44 anesthesiologists	Health	Anesthesiologists do not have sufficient knowledge of AI, and while they are open to applying AI to their practice, anesthesiologists do not expect AI to replace physicians in their practice	
Ayanwale et al. (2022)/ Nigeria	To understand how ready teachers are to teach AI	Quantitative methodology	385 teachers		Confidence and relevance predicted teachers' readiness to teach AI	
Akinmoladun et al. (2022)/ Nigeria	To evaluate knowledge level, attitude and perception of radiologists in Nigerian towards the introduction of AI to the practice of radiology	Cross-sectional survey	163 radiologists	Health	A greater proportion had a positive perception toward the opportunity of using AI systems in radiology practice within their facilities.	Acceptability of these systems is dependent on the level of knowledge of their applications in medical imaging.
Salifu et al. (2023)/ Ghana	To identify factors that influence the behavioural intentions and the actual usage of ChatGPt among economics students in Ghanaian higher education institutes.	Qualitative approach, Descriptive cross-sectional study design	306 students	Education	Design and interactivity have a significant impact on perceived trust. Similarly, perceived trust, social influence, performance expectancy, hedonic motivation, and habits drive behavioural intentions.	Among the various factors influencing behavioural intentions, hedonic motivation emerged as the most dominant. Moreover, behavioural intentions and facilitating conditions significantly drive students' actual use of the ChatGPT.

Author, Year, Country	Purpose	Methodology/ Design	Sample	Sector	Attitudes and Perceptions	Challenges
Mohammed (2023)/ Ghana	To explore educators' experiences, concerns, and expectations regarding integrating AI technologies into their teaching practices	Qualitative approach	8 educators	Education	Perceive AI as vital for enhancing teaching and learning experiences, providing personalised instruction, and facilitating early childhood development. AI will support cognitive, social, and emotional growth among young learners.	Concerns are expressed regarding the implications of AI on human interaction, child privacy, and the role of educators in fostering holistic development.
Muhammad et al. (2023)/ Ghana and Nigeria	The objective of this study is to examine the impact of AI and machine learning on the future of workforce skills and economic mobility in Ghana and Nigeria, and to identify policies and strategies that can be employed to address the skills gap and promote economic mobility	Qualitative approach	The workers, educators, employers,and policymakers in both countries		Participants in the study identified a growing demand for workers with skills that are complementary to AI and machine learning, including data analysis, programming, and critical thinking. However, the education systems in both countries are struggling to keep up with the demand for these skills, leading to a skills gap in the workforce.	The study also found that there are significant challenges associated with the adoption of AI and machine learning technologies in both countries, including limited access to technology, insufficient training opportunities, and cultural attitudes towards technology
Adarkwah et al. (2023) / Ghana	To present an overview of why there is a slow pace of digital transformation in education in Ghana using ChaptGPT as a case scenario	Mixed-method design (qualitative followed by quantitative)	34 academics for qualitative, 50 for quantitative	Education	High enthusiasm about the educational possibilities ChatGPT can afford after being exposed to it	Most of the participants did not have a conceptual understanding of ChatGPT and how it could be applied to learning, teaching and personal development
Nja et al. (2023) /Nigeria	To pinpoint the variables affecting the effective usage of AI among science teachers	Qualitative	79science teachers	Education	Science teachers showed a high level of approval for the utilisation of AI during teaching and learning in science class	

Author, Year, Country	Purpose	Methodology/ Design	Sample	Sector	Attitudes and Perceptions	Challenges
Bello et al. (2023) /Nigeria	To examine journalists' level of awareness and adoption of AI in their journalistic engagements	Survey approach	376 journalists	Journalism	High level of awareness of AI among the population	Due to perceived professional and ethical challenges that undermine their ingenuity, creativity and skillfulness, many of journalists have not adopted AI to their daily practice
Eiriemiokhale et al. (2023) /Nigeria	To explore the awareness and perceptions of AI among librarians in university libraries in Kwara State, Nigeria	Cross-sectional survey	37 professional Nigerians	Education	There is a level of awareness of certain AI, and respondents have a perception that AI tech can be adopted in university libraries, capable of replacing human librarians in future and is a positive development for librarians.	
Edzie et al. (2023) /Ghana	To evaluate the perspectives of Ghanaian radiologists on the integration of AI	Cross-sectional prospective study	77 radiologists	Health	Positive opinions on capabilities of AI, with average awareness of and below average expertise in the usage of AI applications in radiology	Inadequate radiological AI infrastructure in Ghana
Uzir et al. (2023) /Ghana	To identify the intention to use, purchase, satisfaction and spread positive word of mouth	Multiple (three approaches)	550.320,170 people of the general population	Health	Where a crisis or pandemic interrupts regular life, AI-enabled smartwatches can help customers, especially elderly customers, in managing their health issues. The moderating effect of fear of the pandemic indicates that a high level of fear will instigate people to adopt AI-enabled healthcare devices, which can be used easily and conveniently at an affordable price	
Adigwe et al. (2024) /Nigeria	To assess the knowledge and perception of healthcare professionals in Nigeria regarding the application of AI and machine learning in the health sector	Cross-sectional study	healthcare 404 professionals	Health sector	Significant proportion of the study population had good knowledge of AI, with high levels of readiness and enthusiasm for the adoption and enthusiasm of its adoption and implementation	A significant proportion of the population believed that the integration of machine learning in Nigeria's health sector could increase the cost of health services

Author, Year, Country	Purpose	Methodology/ Design	Sample	Sector	Attitudes and Perceptions	Challenges
Ibrahim et al. (2024) /Nigeria	To determine if university teachers' perception of AI use in educational assessment reinforces their belief in academic integrity concerns and if the use of diverse AI tools reinforces their perception of innovative assessment concerns	Inferential design	3083 university teachers	Education	Academic integrity concerns have an influence on how they perceive AI use in assessment. Their perception of innovative assessment concerns influences their utilisation of diverse AI tools in educational assessment. There was a significant relationship between their perception of AI tools and their predisposition to personalise AI use	
Aminu (2024)/ Nigeria	To find out the types of AI technologies that are available for library operations in Federal universities' libraries in North Western states of Nigeria	Quantitative method	73 ICT Staff in the university libraries	Education		The study concluded that the University libraries in the North West States of Nigeria have not adopted many AI technologies in their libraries despite the potential it has for library operations
Rueben andKabilan (2024) /Nigeria	To assess the readiness of North-East universities' lecturers to adopt and integrate AI into their teaching and administrative practices	Quantitative approach	100 university lecturers	Education	Moderate levels of readiness among lecturers with positive attitudes towards the adoption of AI	
Daniel et al.(2024) /Nigeria	To assess the knowledge, practice, perception and expectations about AI tech among staff of Federal Medical Centre Makurdi, Benue state, Nigeria	Cross-sectional study	384 respondents	Health	In-depth knowledge of AI technology was low	Most of the staff thought AI did not make their task easy

Author, Year, Country	Purpose	Methodology/ Design	Sample	Sector	Attitudes and Perceptions	Challenges
Omole andFasina (2024)/ Nigeria	To investigate the adoption of AI among agricultural entrepreneurs in Ondo State, Nigeria	Cross-sectional survey	120 participants involved in agriculture	Agriculture	The majority of farmers who know about and use AI-enabled technologies are those connected in some way or another to the organisations that provide the sieves to them.	
Suleiman (2024)/ Nigeria	To investigate students' perceived readiness for adoption of AI support services in Nigerian universities	Qualitative	45 students	Academics	Generally positive attitude towards the integration of AI in the educational environment	
Baidoo-Anu et al.(2024) /Ghana	To examine the perspectives of Ghanaian high education students on the use of ChatGPT	Quantitative approach	277 students	Education	majority of students are using ChatGPT for their academic work	students' concerns (especially around academic integrity) about the use of Gen AI tools like ChatGPT can limit their potential use of these tools for academic purposes
Mustapha et al.(2024) /Ghana	This study aimed to identify potential obstacles that prevent the implementation of artificial intelligence (AI) in construction health and safety in Ghana.	Questionnaire survey	110 construction experts	Construction industry	According to varied demographic responses, AI increases design and engineering, safety and security, and human resources efficiency, decision-making, and safety. Using AI promises to overcome these hurdles by minimising risks, improving worker well-being, and creating a safe work environment	
Nyarko(2024) /Ghana	to explore Ghanaian tertiary students' perceptions toward AI-driven health information platforms	Cross-sectional survey	50 tertiary students	Healthcare delivery	More than half of the respondents knew of AI-driven health platforms	

Author, Year, Country	Purpose	Methodology/ Design	Sample	Sector	Attitudes and Perceptions	Challenges
Ofosu-Ampong(2023)/ Ghana	To investigate the gender differences in AI-based tools in higher education schools	Quantitative approach	128 students	Education	Significant disparity in the overall levels of perceived innovation characteristics based on gender	
Ogolodom et al. (2023)/ Nigeria	to assess the knowledge and perception of healthcare workers towards the application of AI in healthcare services in Nigeria	Cross-sectional survey	263 healthcare workers	Health	Good knowledge of both medical areas of application of Alas well as the benefits of AI application in healthcare services	Most of the respondents were afraid that their jobs would be taken over by AI in the near future.
Jibril et al. (2024)/ Ghana	To assess how online risk and socio-economic factors influence customers' intention to engage in Internet banking activities.	Quantitative approach, descriptive study	672 bank customers	Banking		Fear of financial loss, fear of reputation damage and avoidance motivation were the perceived online risk factors.

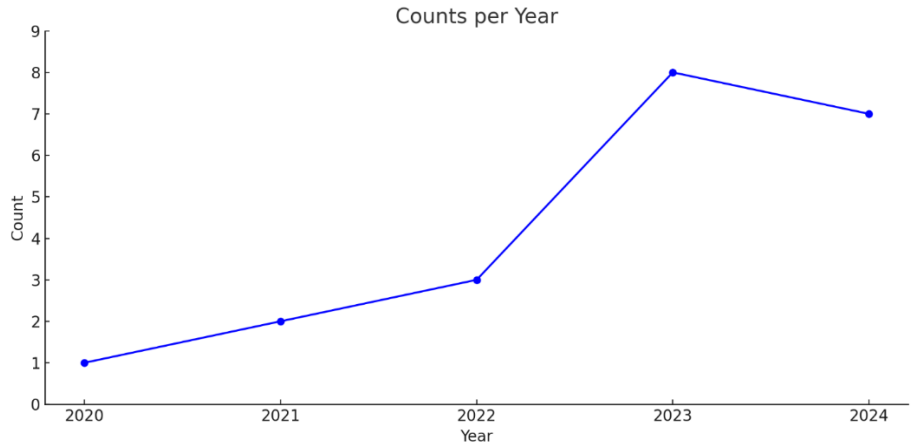

Fig. 3. Distribution of Studies (in Years)

4. Discussion

This systematic review synthesises current literature on attitudes towards AI in Ghana and Nigeria, revealing a complex landscape of attitudes, perceptions, and challenges shaped by various factors, including sector, economic, technological, and social contexts. The findings highlight both enthusiasm for AI's potential and concerns about its implications, reflecting the unique challenges and opportunities present in the region.

Attitudes and Perceptions Towards AI Adoption

Ghana

The level of AI attitudes and perceptions in Ghana from our synthesis is primarily positive, with several studies indicating high levels of awareness and readiness to adopt AI technologies across various sectors. In the education sector, studies revealed that students and educators were aware of AI tools like ChatGPT and had positive perceptions towards their integration into learning and teaching processes. For instance, Salifu et al. (Salifu et al., 2023) reported that economics students at a Ghanaian university viewed AI as valuable for enhancing learning. In the healthcare

sector, Botwe et al. (2021) found that radiographers in Ghana agreed that AI is the future of medical imaging despite challenges like high equipment costs and lack of knowledge. The construction industry also showed promise, with Mustapha et al. (2024) reporting that AI was perceived to increase efficiency in design, engineering, safety, and decision-making.

Nigeria

The level of AI attitudes and perceptions in Nigeria appears to be generally positive across various sectors. Multiple studies reported high levels of awareness and readiness to adopt AI technologies among different groups, including students, educators, healthcare professionals, and journalists (Adelana, Akinyemi, 2021; Adigwe et al., 2024; Akinmoladun et al., 2022; Bello et al., 2023; Ejikem et al., 2022). For instance, in the education sector, students showed awareness and readiness to adopt AI-based tutoring systems (Adelana, Akinyemi, 2021), while science teachers demonstrated high approval for utilising AI in teaching and learning (Nja et al., 2023). In healthcare, radiologists and other professionals exhibited positive perceptions towards incorporating AI systems in their practice (Adigwe et al., 2024; Akinmoladun et al., 2022).

Challenges Facing AI Adoption

Ghana

There are several challenges associated with implementing AI in Ghana. The study by Botwe et al. (Botwe et al., 2021) identified high equipment costs, lack of knowledge, and fear of cyber threats as key factors hindering AI implementation in Ghana's medical imaging sector. Additionally, Edzie et al. (Edzie et al., 2023) noted inadequate radiological AI infrastructure in Ghana as a challenge. The research by Muhammad et al. (2023), which covered both Ghana and Nigeria, highlighted broader challenges, including limited access to technology,insufficient training opportunities, and cultural attitudes towards technology as significant obstacles to AI adoption. These challenges span across different sectors and indicate that Ghana faces both technical and socio-cultural barriers in its efforts to integrate AI technologies.

Nigeria

Several studies highlighted significant challenges to AI adoption and implementation in Nigeria across various sectors. In academic libraries, obstacles included poor ICT skills and technical expertise among staff, high initial costs of implementation, fear of job displacement, unreliable power supply, poor maintenance culture, resistance to change, inadequate network connectivity, and privacy and ethical concerns (Ogqo et al., 2023). The education sector struggled to keep pace with the growing demand for AI-related skills, leading to a skills gap in the workforce (Muhammad et al., 2023). In the journalism field, perceived professional and ethical challenges hindered AI adoption in daily practice, as many journalists felt it could undermine their creativity and skillfulness (Bello et al., 2023). Healthcare professionals expressed concerns about potential job losses due to AI integration (Ogolodom et al., 2023). Additionally, there was a general lack of sufficient knowledge about AI among professionals in various fields, including anesthesiology (Ejikem et al., 2022), while some groups, such as journalists, have not fully adopted AI in their daily practices due to perceived professional and ethical challenges, despite high awareness levels (Bello et al., 2023). These challenges collectively point to a need for improved infrastructure and education, as well as for addressing ethical concerns to facilitate smoother AI integration across Nigerian industries.

5. Conclusion

Attitudes towards AI in Ghana and Nigeria are characterised by a blend of enthusiasm and caution, shaped by factors such as education, sector-specific needs, and technological readiness. While challenges exist, particularly in infrastructure and expertise, there is significant potential for AI to contribute to sustainable development in the region. Realising this potential will require tailored policies, targeted education initiatives, and continued research to understand and shape AI perceptions in the unique context of Sub-Saharan Africa.

Policy, Practice and Research Implications

Based on the review's findings, policymakers in Ghana and Nigeria should prioritise developing comprehensive AI strategies tailored to the region's unique context. These strategies should focus on enhancing digital infrastructure, especially in rural areas, and integrating AI education into curricula at all levels to improve literacy and skills. Regulatory frameworks should be established to promote innovation while addressing privacy and security concerns. Policies should encourage public-private partnerships to drive AI research and development that are

aligned with local needs, particularly in high-potential sectors like healthcare and education. Additionally, efforts should be made to align AI initiatives with broader development goals, ensuring that AI adoption addresses pressing challenges in areas such as healthcare delivery, agricultural productivity, and educational access.

Limitations

This systematic review, notwithstanding its valuable contributions, has the following limitations. Firstly, it focused exclusively on studies published in the English language. Although English is the official language in both Ghana and Nigeria, it may have limited the coverage and depth of the included studies as there may be a possibility of excluding relevant research published in other languages from these countries. Moreover, most of the included studies were cross-sectional surveys that relied on self-reported behaviours and perceptions that were subjective. Despite these limitations, the review successfully incorporated studies from both Ghana and Nigeria, providing valuable insights and helping to review systematically the emerging issue that has a valuable impact on development.

6. Acknowledgements

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Authors' contributions

JOS and GT-D conceptualised and designed the study. JOS, GT-D, PM, and EKA collected and conducted the review and wrote the initial draft. All authors read and approved the final version of the manuscript for publication.

Ethics approval and consent to participate

This study was part of a larger research project that received ethical approval from the Institutional Review Board of the University of Cape Coast (ID: UCCIRB/EXT/2023/56). All sources were properly cited, and the review adhered to strict standards of academic integrity and transparency throughout the process.

Availability of data and material

All data generated or analysed during this study are available online as published articles.

Competing interests

The authors declare that they have no competing interests.

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Women's Digital Literacy in Village Information System Use

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Abstract

Digital literacy plays a pivotal role in empowering rural communities, especially in the context of the rapidly evolving digital era. In Indonesia, initiatives like the Village Information System (SID) have been introduced to improve local governance through e-governance platforms. However, the specific challenges and opportunities faced by women in these rural digital initiatives remain understudied. This research focuses on the digital literacy of women in Randegan Village, Banyumas, and their engagement with SID. Despite growing attention to digital literacy, there is limited understanding of the gendered dimensions of participation in village-level digital programs. This study addresses this gap by examining how women in rural settings perceive and interact with digital technologies, particularly in the realm of local governance. The research employed a qualitative approach. Four key dimensions of digital literacy were explored: digital skills, security, ethics, and culture. The findings reveal that while basic digital literacy is emerging, particularly among community leaders. Although awareness of digital ethics and security is increasing, it has not yet translated into consistent practice. Moreover, traditional communication methods are still preferred over digital platforms for civic engagement, and women's participation in SID management remains limited.

Keywords: digital literacy, Indonesia, e-governance, rural development, rural women.

1. Introduction

The spread of information and communication technologies (ICTs) has transformed societies around the world, including rural communities in developing countries, in the rapidly evolving digital landscape of the 21st century. With its vast archipelagic geography and diverse population, Indonesia is at the forefront of this digital revolution, particularly in bridging the rural-urban divide through innovative e-governance initiatives. One such initiative is the Village Information System (Sistem Informasi Desa or SID), a digital platform designed to improve transparency, efficiency, and connectivity at the village level (Pramanik et al., 2017).

The term digital literacy is defined as the ability to access, understand, evaluate, and produce digital content. This plays a pivotal role in enabling individuals to engage effectively in the digital economy and society (Lee, 2014). Given the persisting gender disparities in technology access and usage in rural Indonesia, enhancing women's digital literacy has become a crucial aspect of achieving inclusive digital development. While recent statistics indicate that the number of female internet users in Indonesia has been growing, there still remains a considerable gender gap with regard to meaningful participation in digital governance initiatives (Rahmatunnisa, 2024). It is of the utmost importance to include women in digital initiatives such as Village Information System (Sistem Informasi Desa or SID).

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The concept of digital literacy is multifaceted, encompassing a range of dimensions, including digital skills, digital safety, digital ethics, and digital culture. Each of these aspects is of critical importance in enabling individuals to navigate the digital landscape in an effective and responsible manner. In the context of SID utilization, these dimensions assume even greater significance, as they directly impact the quality and extent of community participation in local governance and development initiatives. The research conducted by Mutiarin et al., (2024) in Central Java indicates that when women have access to and the capacity to utilize SID, they are more inclined to engage in village meetings and submit program proposals (Mutiarin et al., 2024).

The acquisition of digital literacy empowers women to gain access to crucial services via the SID platform. For instance, a study conducted by Putri et al. (Putri et al., 2020) in Yogyakarta illustrates that women who have aattained proficiency in digital technologies are more prone to utilize digital platforms for accessing health and educational data at the village level. The Association of Indonesian Internet Service Providers (APJII) has projected that the number of Indonesian internet users in 2024 will reach 221,563,479 individuals, representing a significant increase from the total population of 278,696,200 Indonesians in 2023. As of 2018, Indonesia exhibited an internet penetration rate of 64.8 %. Subsequently, the figure reached 73.7 % in 2020, 77.01 % in 2022, and 78.19 % in 2023. With regard to gender, the majority of internet users in Indonesia are male (50.7 %), while the female population accounts for 49.1 % (APJII, 2024).

Despite growing interest in digital literacy and e-governance in rural areas, several research gaps persist, particularly in the context of women's participation in village-level digital initiatives in Indonesia. Most studies on digital literacy in rural areas have not adequately addressed gender-specific challenges and opportunities. For instance, Akbar and Wijaya (Akbar, Wijaya, 2024) highlighted the general digital literacy challenges in rural Indonesia but did not delve into the specific experiences of women. There is a need for research that specifically examines how women in rural areas interact with and perceive digital technologies, particularly in the context of local governance systems like SID (Akbar, Wijaya, 2024).

Furthermore, while research has been conducted on e-governance initiatives in developing countries, there is limited understanding of how digital literacy levels impact participation in local governance systems. explored e-governance adoption in rural areas but did not specifically address how varying levels of digital literacy among women affect their engagement with such systems (Kumar et al., 2024). This gap calls for research that explicitly links digital literacy skills to participation in initiatives like SID.

Many studies on digital literacy focus primarily on technical skills, overlooking other crucial aspects such as digital safety, ethics, and culture. Comprehensive research has been conducted on digital literacy in rural Asia that touches on aspects such as digital safety, ethics, and culture but does not provide an in-depth analysis of how these aspects interact with each other in the context of community information systems (Tewathia et al., 2020). There is a need for research that adopts a more holistic approach to assessing digital literacy, especially among rural women. The influence of local cultural, social and economic factors on digital literacy and participation in digital governance initiatives among rural women remains under-researched. Other research explores the issue of digital divide in rural communities, but does not adequately address how local contexts shape women's digital engagement (Lythreatis et al., 2022). This gap calls for research that considers the unique contextual factors of Indonesian villages in relation to women's digital literacy and SID participation.

While several studies have identified common barriers to digital adoption in rural areas, there is a lack of research that addresses barriers and enablers to women's participation in digital governance initiatives. Previous research addresses barriers to digital adoption in rural communities, but does not focus on gender-specific challenges. Research is needed to identify and analyze factors that hinder or facilitate women's involvement in systems such as SID (Vassilakopoulou, Hustad, 2023). The lack of long-term research examining the impact of digital literacy interventions on women's participation in local government systems suggests a significant gap (Nedungadi et al., 2018). Further, other studies describe digital literacy programs in rural areas, but do not specifically link to increased participation in e-governance initiatives. This gap calls for research that assesses the long-term effects of improved digital literacy on women's engagement in systems such as SID.

The role of community networks and social capital in influencing the development of digital literacy skills among rural women is another area that requires further investigation. One study has

explored the role of social networks in technology adoption, but did not specifically address how these networks contribute to the development of digital literacy (Suwana, Lily, 2017). There is a need for research that examines how community dynamics in Indonesian villages affect women's digital literacy and their participation in SID.

Additionally, the interaction between digital literacy and other forms of literacy (e.g., functional literacy, media literacy) in the context of rural women's participation in digital governance remains understudied. Roberts et al. (Roberts et al., 2017) explored multiple literacies in rural development, but they did not specifically focus on how these literacies impact engagement with local information systems. Research is needed to understand the interplay between various forms of literacy and their collective impact on women's participation in initiatives like SID. The long-term sustainability of digital literacy skills among rural women, particularly in the context of evolving technologies and governance systems, is another area that requires attention. Chib and Wardoyo (Chib, Wardoyo, 2018) discussed the challenges of maintaining digital skills in rural areas but did not provide insights into strategies for ensuring the ongoing relevance and application of these skills. There is a need for research that explores how to sustain and update digital literacy skills among rural women to ensure continued engagement with systems like SID (Chib, Wardoyo, 2018; Roberts et al., 2017).

The concept of empowerment through digital literacy has been explored in urban contexts, there is limited research on how digital literacy contributes to the empowerment of rural women, particularly in relation to local governance participation. Gwaka et al. examined digital empowerment in developing countries but did not specifically address rural women's empowerment through participation in local digital initiatives. Research is needed to understand how enhanced digital literacy can lead to greater empowerment and agency for rural women in the context of village governance (Gwaka et al., 2018).

In view of the aforementioned research gaps, the present study seeks to examine the digital literacy levels of women in Randegan Village, Banyumas, Indonesia, with a particular focus on their utilisation of the Village Information System (SID). The research will concentrate on four principal aspects of digital literacy: digital skills, digital safety, digital ethics, and digital culture. Adopting a holistic approach to digital literacy assessment and considering the unique contextual factors of rural Indonesian villages, this study aims to provide a comprehensive understanding of the impact of digital literacy on women's participation in local digital governance initiatives.

This research contributes to the academic discourse on digital literacy and e-governance while also providing practical insights for policymakers, development practitioners, and local leaders seeking to enhance the digital participation and empowerment of women in rural areas. By addressing the identified research gaps, this study aims to pave the way for more inclusive, effective, and sustainable digital governance initiatives that can truly harness the potential of technology for rural development and women's empowerment.

2. Materials and methods

Randegan Village, located in Banyumas Regency, Indonesia, presents an intriguing case study for digital literacy research. Despite its remote location far from urban centers, Randegan has implemented a village information system (SID) website, making it an attractive site for investigating rural digital adoption. This study examines women's digital literacy in utilizing the SID, focusing on four pillars: digital skills, digital security, digital ethics, and digital culture.

The Village Information System (SID) is a digital platform designed to improve governance and service delivery in rural Indonesia. SID typically includes features such as village demographic data, financial reports, and various administrative services (Novianti, 2024). In Randegan, the SID offers information about the village, population-related document processing, and access to village financial reports.

This study employed a qualitative approach to explore women's digital literacy in Randegan Village. The research design was informed by established qualitative methodologies (Creswell, Poth, 2018). Data collection methods included focus group discussions (FGDs), in-depth interviews, and observation. Five FGDs were conducted with groups of women aged 25–55 years, totaling 45 participants. This approach allowed for rich, interactive discussions about digital literacy experiences (Krueger, Casey, 2015). Key informants, including SID managers and village officials, were interviewed to gain deeper insights into SID implementation and challenges.

Additionally, researchers observed participants' interactions with the SID platform to assess practical digital skills.

Data analysis followed the thematic analysis approach outlined by Braun and Clarke (Braun, Clark, 2022), involving familiarization with the data, coding, theme development, and refinement. To ensure reliability, triangulation of data sources and methods was employed (Flick, 2018). The study focused on four key dimensions of digital literacy: digital skills, digital security, digital ethics, and digital culture. Digital skills were assessed as the ability to access, understand, evaluate, and produce digital content. Digital security encompassed awareness and practices related to data protection and online safety. Digital ethics examined adherence to values of transparency, honesty, and respect in digital interactions. Finally, digital culture explored the extent to which digital tools are integrated into daily life and community practices. This framework allowed for a comprehensive assessment of women's digital literacy in the context of SID utilization.

3. Discussion

The digital transformation of rural Indonesia presents both opportunities and challenges, particularly in the context of women's digital literacy and participation in village information systems (SID). Focusing on the village of Randegan, this study reveals a complex interplay of factors influencing women's digital engagement across the four pillars of digital literacy as defined by the Indonesian Ministry of Communication and Information Technology (Kominfo): digital skills, digital culture, digital ethics, and digital safety (Kementerian..., 2021). These four pillars form the backbone of Indonesia's National Digital Literacy Program, a comprehensive initiative to improve digital literacy across the country. This highlights the importance of such frameworks in shaping the country's digital landscape (SMERU, 2022).

The Village Information System (SID) is a digital platform used by rural communities in Indonesia to access government services, communicate with local authorities, and participate in local governance. Define digital platforms as digital services that facilitate interactions between different sets of users. SID is a transactional platform that mediates interactions between villagers and local governments, helping to increase transparency and governance efficiency in rural areas (Bonina et al., 2021).

The Village Information System (SID) is a digital platform used by rural communities in Indonesia to access government services, communicate with local authorities, and participate in local governance. Define digital platforms as digital services that facilitate interactions between different sets of users. SID is a transactional platform that mediates interactions between villagers and local governments, helping to increase transparency and governance efficiency in rural areas. However, the successful adoption and use of SID among rural women depend on addressing the digital literacy gap. The development of media competencies is a structured process that requires not only technical skills but also content generation and critical thinking (Kuatbekov et al., 2021).

Digital literacy is essential in shaping how individuals access, evaluate, and interact with information in digital spaces. This insight highlights the importance of equipping women in Randegan with the necessary skills to fully utilize platforms like SID, where navigating and understanding information is crucial. The study found that although many women are aware of digital tools, their ability to critically evaluate information and utilize advanced features of SID remains limited, similar to global trends where digital literacy gaps persist (Guess, Munger, 2020).

The COVID-19 pandemic further emphasized the urgency of addressing digital literacy disparities. A research found that marginalized women, particularly those recently released from prison, faced severe challenges in accessing digital resources during the pandemic. This mirrors the situation in Randegan, where women, despite having access to SID, struggle with digital infrastructure and a lack of consistent digital literacy training (Blomberg et al., 2021).

Empowering women with digital literacy not only enhances their engagement with digital platforms but also enables them to contribute to broader societal and environmental issues. One study emphasized how digital health literacy can empower women to take an active role in climate action and health initiatives. Similarly, in Randegan, improving digital literacy among women can increase their participation in local governance and decision-making processes, which extends beyond SIDs to broader community and environmental action (Abdolkhani et al., 2022) emphasized how digital health literacy can empower women to take an active role in climate action and health initiatives. Similarly, in Randegan, improving digital literacy among women could

enhance their participation in local governance and decision-making processes, extending beyond SID to broader community and environmental actions.

In addition, a participatory approach to digital literacy development proved effective. In Canada, it is evident that digital literacy programs with Indigenous communities are needed to ensure cultural relevance and sustainability. A similar participatory model could be adopted in Randegan, where women are actively involved in designing digital literacy initiatives tailored to their specific needs and context (McMahon et al., 2023).

Digital literacy also plays a crucial role in education, particularly in contexts where access to formal education is limited. Community-driven programs are effective in reaching marginalized populations and improving digital literacy outcomes. In Randegan, similar community-led initiatives could be instrumental in reaching women and other marginalized groups. The importance of community-led initiatives, such as coding clubs in public libraries, to develop digital skills among youth in rural areas. Similarly, local initiatives in Randegan could focus on community-driven digital literacy programs to bridge the digital divide (Detlor et al., 2022; Kelly, McGrath, Hubbard, 2022).

The evolving nature of media studies in a digital era necessitates a rethinking of how media literacy is approached, especially in non-urban settings where traditional forms of media are still prevalent (Parks, 2020). In Randegan, while basic digital skills are emerging, there is a need for more advanced competencies, particularly in the areas of content creation and ethical digital practices. This is in line with research findings highlighting the need for culturally adaptive media education that addresses both the technical and social dimensions of digital literacy (Green, Connolly, 2022).

4. Results

Digital literacy is essential for navigating today's increasingly digital world. In Indonesia, the Ministry of Communication and Informatics (Kominfo) has developed a comprehensive framework of four key pillars to guide the development of digital literacy: Digital Skills, Digital Ethics, Digital Safety, and Digital Culture. Each pillar represents a critical area in which individuals must develop competencies to become fully digitally literate.

In rural areas like Randegan Village, the need to embrace these four pillars is evident in the challenges faced in using digital platforms for governance and community engagement. While there are promising developments in basic digital literacy, significant gaps remain, particularly in the areas of ethics, security, and fostering a robust digital culture. Integrating all four pillars into educational programs and community initiatives is critical to creating a truly digitally literate society.

a. Digital Skills: Emerging Competencies Amidst Challenges

The findings indicate a nascent but growing digital skill set among women in Randegan Village, particularly among those involved in community roles such as Posyandu (integrated health service post) cadres. The necessity to use smartphones for reporting and documentation has driven a basic level of digital competency. This aligns with global trends where mobile technology serves as a primary gateway to digital literacy in rural areas (Tyers et al., 2021). However, the limited utilization of the SID platform, with a preference for WhatsApp groups for information dissemination, suggests a gap between basic digital skills and more advanced platform-specific competencies.

This disparity echoes findings from other rural contexts, where familiarity with social media platforms often precedes engagement with more complex digital systems (Van Deursen et al., 2017). A study of Indonesia's digital villages shows that successful implementation of digital governance tools requires not only access to technology, but also targeted skills development programs.

b. Digital Ethics: Navigating Social Norms in Digital Spaces

The incident described by Informant A, where a seemingly innocuous social media interaction led to domestic conflict, highlights the complex interplay between digital ethics and local social norms. This scenario underscores the need for digital literacy programs to address not just technical skills, but also the social implications of digital engagement. Digital ethics in the Indonesian context must be understood within the framework of local cultural values and social expectations (Rahmah, 2015).

The decision to restrict comments on social media posts in response to this incident reflects a broader challenge in digital ethics education. It demonstrates a reactive approach to digital conflict

rather than a proactive understanding of ethical online behavior. This suggests a need for more comprehensive digital ethics education that goes beyond basic 'netiquette' to address the nuanced ways in which digital interactions intersect with local social dynamics (Soler-Costa et al., 2021).

c. Digital Safety: Awareness and Action in Cybersecurity

The study reveals a growing awareness of digital safety issues among Randegan's residents, particularly concerning phishing and online fraud. The role of family members, especially younger generations, in educating older relatives about digital threats aligns with findings from other studies on intergenerational digital literacy transfer (Van Deursen et al., 2017). Additionally, the proactive stance of village officials in educating residents about digital threats is a positive sign, indicating a community-level approach to digital safety.

However, the lack of a systematic approach to data backup and protection in the SID system points to a significant gap in institutional digital safety practices. This discrepancy between individual awareness and institutional practices echoes findings from other studies on e-governance in developing contexts, where technical infrastructure often lags behind policy initiatives. Strengthening institutional cybersecurity practices is essential to protect both individual and community-level digital engagements (Zahra, 2023).

d. Digital Culture: The Slow Evolution of Digital Civic Engagement

The underutilization of the SID platform reflects a broader challenge in cultivating a digital culture of civic engagement. The preference for traditional face-to-face meetings and the inclusion of women in village decision-making processes is positive. However, the failure to translate this inclusive approach into digital spaces suggests a disconnect between offline and online civic cultures.

This disconnect is not unique to Randegan and reflects broader challenges in digital transformation of rural governance. The study on the adoption of e-government in rural areas found that the success of digital platforms depends not only on the technological infrastructure, but also on their alignment with existing social and cultural practices (Munyoka, Maharaj, 2017).

The engagement of women, particularly Posyandu cadres, in village meetings presents an opportunity for bridging this digital-physical divide. These women, already trusted within the community and possessing basic digital skills, could potentially serve as digital ambassadors, facilitating broader adoption of the SID platform.

e. Integrating the Four Pillars: Towards Comprehensive Digital Literacy

The interplay between the four pillars of digital literacy in Randegan Village reveals both progress and persistent challenges. While basic digital skills are developing, particularly driven by necessity in community health roles, there's a clear need for more targeted education in digital ethics and safety. The nascent digital culture, while inclusive in offline spaces, has yet to fully manifest in digital civic engagement.

This multifaceted nature of digital literacy aligns with current scholarly understanding of digital inclusion. As Van Dijk argues in his comprehensive work on the digital divide, true digital inclusion requires not just access to technology and basic skills, but also the motivation to engage and the ability to translate digital capabilities into tangible benefits (Van Dijk, 2020). A holistic approach to digital literacy addresses all four pillars simultaneously. such an approach could involve:

a. Targeted skill development programs that focus not just on basic digital operations but on the specific competencies required for effective use of platforms like SID.

b. Community-based digital ethics workshops that address the intersection of online behavior with local social norms and values.

c. Collaborative efforts between local government and community leaders to enhance digital safety practices, both at the individual and institutional levels.

d. Initiatives to foster a digital culture of civic engagement, potentially leveraging existing community networks like Posyandu cadres.

The case of Randegan Village illustrates the complex challenges in fostering digital literacy and engagement in rural Indonesia. While progress is evident, particularly in basic digital skills and awareness of digital safety, significant work remains in cultivating a comprehensive digital culture that encompasses all four pillars of digital literacy (Azanda et al., 2024).

Table 1. Four Pillars of Digital Literacy

Pillar	Description
Digital Skills	Technical abilities to effectively use digital devices and information technology
Digital Ethics	Responsible behavior in the digital world, including respectful interaction and adherence to digital laws
Digital Safety	Ability to protect oneself and personal data from cyber threats
Digital Culture	Understanding of digital norms and active participation in shaping a positive digital environment

Table 2. Degree of Understanding for Each Pillar in Randegan Village

Pillar	Degree of Understanding	Description
Digital Skills	Moderate	Basic smartphone usage skills, particularly among Posyandu cadres. Limited engagement with more complex platforms like SID
Digital Ethics	Low to Moderate	Some awareness of online behavior implications, but reactive rather than proactive approach to ethical challenges
Digital Safety	Moderate	Growing awareness of digital threats like phishing, but lack of systematic approach to data protection
Digital Culture	Low	Limited integration of digital tools in civic engagement, preference for traditional communication methods

f. Implications for Policy and Practice

The findings from Randegan Village underscore several critical implications for advancing rural digital literacy initiatives. The first major takeaway is the need for contextualized digital literacy programs. These initiatives must not only focus on the technical skills necessary for digital engagement but also be attuned to local social norms and cultural practices. In rural areas like Randegan, traditional communication methods, such as face-to-face interactions, are still highly preferred. This means that digital tools must be introduced in ways that align with these existing communication practices, ensuring that technology enhances, rather than disrupts, local customs (Stein et al., 2022). Successful digital literacy programs will need to balance modern technology with the cultural frameworks within which communities operate.

Another important strategy is intergenerational learning, which leverages the digital fluency of younger generations to mentor older members of the community. Younger people, who generally have more exposure to and comfort with digital technologies, can transfer their knowledge to older individuals, thus helping bridge the digital divide. This approach does more than just enhance digital literacy; it strengthens relationships across generations, fostering a sense of communal learning and support (Hernandez et al., 2024). In Randegan Village, where family structures remain strong, intergenerational learning is a particularly effective method for spreading digital literacy across age groups.

A third key factor is the role of community-based digital ambassadors, particularly women who are already engaged in essential community roles such as Posyandu cadres. These women, being trusted figures within their communities, are well-positioned to take on leadership roles in promoting digital literacy. Empowering them to act as digital ambassadors can significantly increase digital adoption, as they can provide peer support and guidance. This grassroots approach is especially beneficial in rural settings where formal digital education infrastructure is limited, making local mentorship crucial to success.

Moreover, institutional capacity building is essential, particularly in terms of data management and digital security. As digital platforms like SID (village information systems) become more prevalent, there is a need to concurrently strengthen the institutions responsible for managing these platforms. This includes developing better data management protocols and implementing robust digital security measures to mitigate cybersecurity threats. Without these institutional safeguards, the long-term sustainability and security of digital initiatives in rural areas are at risk.

Lastly, an integrated approach to e-governance is also crucial. Digital platforms should not be introduced in isolation; they must be supported by comprehensive strategies that engage the community and develop necessary skills. For platforms like SID to be effectively utilized, efforts should focus not only on making the technology available but also on ensuring that the community is both willing and able to use it. This means incorporating training and community outreach into e-governance projects to promote active participation, both online and offline.

5. Conclusion

This study reveals the complex landscape of digital literacy among women in Randegan Village and their engagement with the Village Information System (SID). While basic digital skills are emerging, particularly among community leaders like Posyandu cadres, significant gaps remain in advanced competencies necessary for full SID utilization. Understanding of digital ethics and safety is growing but not yet matched by systematic practices. The digital culture is still evolving, with traditional communication methods often preferred over digital platforms for civic engagement.

Women's participation in SID management is limited, despite their inclusion in traditional village decision-making processes. However, their community roles present an opportunity to serve as digital ambassadors. Moving forward, targeted interventions addressing all aspects of digital literacy are needed, focusing on contextualizing efforts to local needs and cultural practices. By comprehensively addressing these areas, there's potential to enhance women's digital literacy and increase their active participation in digital governance, contributing to more inclusive and effective e-governance at the village level.

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Comparative Analysis of Social Media Literacy Model Among Young Adults in Malaysia

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Abstract

With approximately 33.59 million internet users in Malaysia, concerns have arisen over users' ability to ethically and effectively analyse and engage with diverse digital media content. This study examines social media literacy models among young adults in Malaysia, focusing on the relationships between functional consuming, functional prosuming, critical consuming, and critical prosuming. Using a quantitative research approach, findings reveal that Malaysians possess moderate social media literacy skills, indicating a pressing need to identify effective ways to enhance literacy, especially for Malaysians in East Malaysia who may not access information as consistently as those in West Malaysia. The findings also show that all hypotheses are supported, emphasizing the importance of improving media literacy to help individuals navigate the digital space responsibly, effectively, and ethically. The study suggests that strengthening functional consuming skills can foster better prosuming abilities, ultimately enhancing individuals' critical evaluation of diverse online content. Practical implications for decision-makers, educators, and community leaders are highlighted, encouraging efforts to improve social media literacy and promote digital citizenship among young adults across varied socio-economic backgrounds in Malaysia. This analysis contributes valuable insights to digital literacy research and offers essential guidance for strategies to foster informed and responsible online behaviour among young adults.

Keywords: social media literacy, young adults, functional consuming, functional prosuming, critical consuming, critical presuming.

1. Introduction

Media literacy has gained importance, especially during the COVID-19 pandemic, which the WHO called an “infodemic” due to the spread of misinformation. The need for media literacy is underscored by findings that fake news constituted 60-70 % of content on social media during the pandemic (Al Zou'bi, 2022). Social media algorithms also promote sensational content to drive traffic, where such posts outperform quality news (Dujeancourt, Garz, 2022). Scholars also emphasize how algorithms influence news consumption, making it crucial for individuals to discern trustworthy content (Adeline, Ahmad, 2022).

Previous research has delved into the social media literacy of adolescents and young adults, exploring their ability to navigate media messages, acquire knowledge, and develop skills within the realm of social media usage (Drake et al., 2023; Geraee et al., 2015; Wendt, 2023). Additionally, some studies have concentrated on undergraduate students, examining the influence of media literacy on their capacity to analyse media content critically (Moore, 2015) and the impact

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of media literacy skills on learning outcomes (Tran-Duong, 2023). However, most studies have primarily concentrated on Western and English-speaking populations (Facciani et al., 2023).

There are few studies in the Malaysian context which examine the impact of social media information literacy on Malaysian youth's emotional intelligence (Abdul Rahman et al., 2023) and explore teachers' perceptions of challenges related to integrating digital information literacy in students (Salsuhaida et al., 2023). Some studies are related to applying a social media literacy model but focus on crime prevention (Jamilah et al., 2015), the interpretation of violent media messages (Leong, Kho, 2022). Furthermore, past studies have also examined the levels of new media literacy among university students in Malaysia, measuring the relationship between media use and new media literacy (Chin, Hasmah, 2019; Chen et al. 2022; Ahmad Syakir et al. 2024; Abdul Rahman et al., 2023).

However, they have predominantly focused on a single private university rather than the broader Malaysian population. Consequently, it is necessary to comprehensively assess social media literacy levels across Malaysia. The study samples should encompass individuals residing in both urban and rural areas, particularly those in rural regions with internet access, such as the Orang Asli, as well as those residing in East Malaysia, to enhance the reliability and validity of the data.

Malaysia is a unique country with a diverse, multiracial society, boasting rich cultural traditions and various religious practices. Evolving from its colonial past, Malaysia has rapidly transitioned into a fast-growing industrial nation, propelled by the ambitious goal of achieving high-technology status by 2030 (iTnews Asia Team, 2021). Nevertheless, given Malaysia's status as a multiracial country rich in various religions and cultural practices, there is a heightened risk of misinformation inciting animosity and jeopardising the nation's harmony and democracy. Therefore, examining the understanding of media literacy among Malaysians is imperative to assess their critical roles in consuming media content. This study examines Malaysian social media literacy using the proposed social media literacy model by Lin et al. (Lin et al., 2013). It aims to assess functional consuming, critical consuming, functional prosuming, and critical prosuming aspects of social media literacy among young adults in Malaysia using the mean and standard deviation scores. The initial evaluation in this study investigates whether functional consumption positively impacts functional prosuming within the framework of the social media literacy model. Subsequently, this research will ascertain if functional consumption positively affects critical consumption within the same literacy model. The third evaluation recommended by the social media literacy model aims to reveal whether functional prosuming has a beneficial influence on critical prosuming. Lastly, the final assessment examines the positive correlation between critical consuming and critical prosuming, posited by the social media literacy model (see Figure 1).

2. Materials and methods

A cross-sectional survey was conducted in Malaysia utilising an online method, targeting individuals aged 18 to 35 who spend at least two hours daily on social media platforms. The non-probability judgmental sampling technique was employed, consistent with established research practices suggested by Sekaran and Bougie (Sekaran, Bougie, 2019). The minimum sample size was calculated using G*Power 3.1.9.7 software, requiring a sample size of 129 when effect size is 0.15 by 80 % power level (Hair et al., 2022). In total of 270 questionnaires were distributed, with 221 questionnaires were considered useful, while 49 incomplete surveys were not analysed. The respondents were primarily female, living in urban area, students, and had at least a Bachelor's degree, as illustrated in Table 1. The Structural Equation Modelling-Partial Least Squares (SEM-PLS) was utilised in analysing the measurement model and the structural model. SmartPLS 4.0 proposed by Christian Ringle and his team (Ringle et al., 2024), and SPSS software version 29 were then used in analysing the data. Indicator items for the constructs were adapted from prior research and tailored to the context of social media literacy. A 5-point Likert scale from (1) strongly disagree to (5) strongly agree was used in measuring all the variables.

Table 1. Demographic Profiles of Respondents

Variable	*Classification*	*Frequency*	*Percentage (%)*
Gender	Male	71	32.1
	Female	147	66.5

Variable	*Classification*	*Frequency*	*Percentage (%)*
	Prefer not to say	3	1.4
Hours spend on social media platforms	2-3.99 hours	24	10.9
	4-5.99 hours	53	24.0
	6-7.99 hours	68	30.8
	Above 8 hours	76	34.4
Area	Urban	172	77.8
	Rural	49	22.2
Education Level	SPM or lower	21	9.5
	STPM or Matriculation	3	1.4
	Foundation or Diploma	71	32.1
	Bachelor's Degree	108	48.9
	Master's Degree	11	5.0
	Doctoral Degree	7	3.2
Employment	Private sector	24	10.9
	Public sector	6	2.7
	Self-employed	3	1.4
	Unemployed	5	2.3
	Freelance	1	0.5
	Housewife	1	0.5
	Student	181	81.9

3. Discussion

Overview of Social Media Literacy

Media literacy involves engaging with, understanding, and creating media content. Traditionally focused on passive consumption of media like newspapers and TV (Kara et al., 2018), it has evolved with the rise of new media, allowing active participation and critical engagement (Luan et al., 2020). McLuhan's concept, "the medium is the message," highlights how the platform shapes content perception. This shift emphasizes the need for both functional and critical skills, including digital content creation, collaboration, online safety, and problem-solving (Brown, 2018).

A framework transitioning from consuming to "prosuming" literacy, where critical literacy builds on functional literacy, was introduced, with functional literacy focusing on media tool use and critical literacy involving the analysis and critique of content (Chen et al., 2011). This framework was further expanded to redefine literacy as encompassing technical and socio-cultural aspects of new media (Lin et al., 2013). Higher new media literacy, which has been shown to lead to greater engagement with media and influence both usage frequency and purpose, was also identified as significant (Xu et al., 2022).

As pointed out by (Xu et al., 2022), individuals with higher levels of new media literacy tend to exhibit greater interest in new media than those with lower literacy levels. This implied that new media literacy can influence the frequency and manner in which we utilise media for various purposes.

Lin et al. (Lin et al., 2013) built upon this framework, retaining Chen et al. (2011) four types of new media literacy but adding ten detailed indicators to further elaborate on functioning consuming (FC), critical consuming (CC), functional prosuming (FP), and critical prosuming (CP). Each type represents a different proficiency level, from basic consumption to critical engagement and content creation (Chen et al., 2011; Lin et al., 2013) (see Figure 1).

Functional Consuming

Functional consuming literacy is the initial starting point in developing the model because users must at least be familiar with the technical characteristics of new media technology and new media language to engage with it actively (Lin et al., 2013). This involves both consuming skill and understanding. (a) Consuming skills focus on an individual's ability to interact with media content, specifically how they utilise information technology and the internet on social media. This requires technical skills such as hardware and software proficiency to consume media content. (b) Understanding means comprehending ideas presented in different media types and interpreting the format's meaning. As supported by scholars, users must be able to comprehend and utilise

different media forms before critically analysing the hidden message within a media text (Chen et al., 2011). Therefore, functional consumption is essential to determine whether an individual can operate and engage with various types of media forms and understand the textual meaning of a media text.

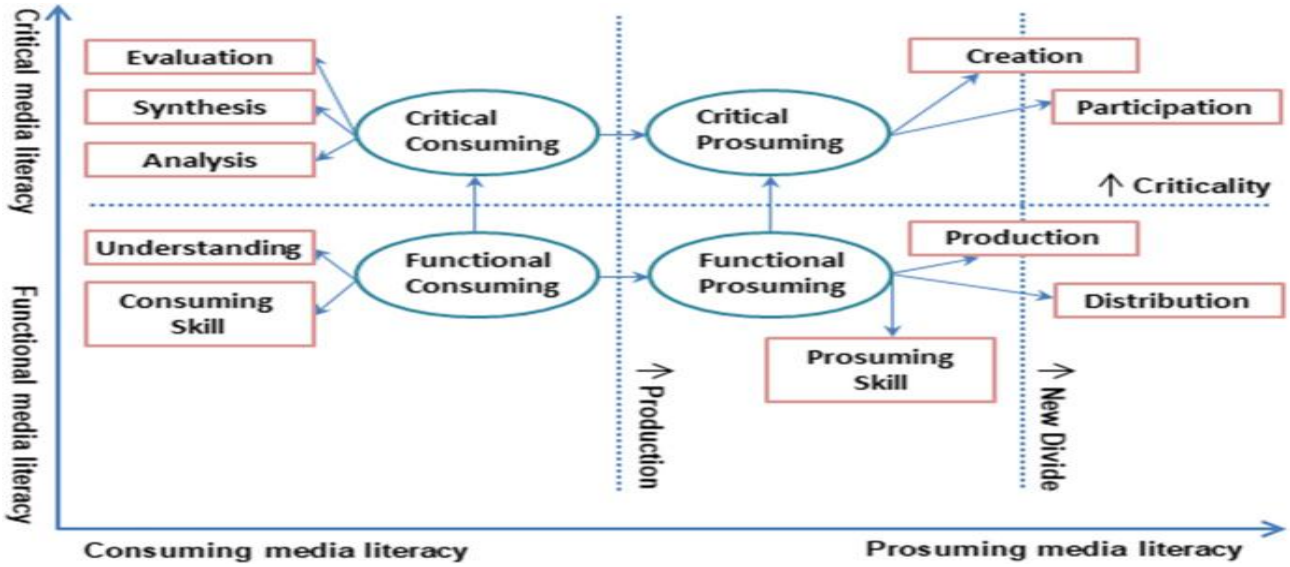

Fig. 1. Social Media Literacy Model

Critical Consuming

Critical Consuming Literacy involves the audience's ability to evaluate, synthesise, and analyse media content. (a) Analytical skills require a higher level of comprehension, not merely understanding the message in general but deconstructing the hidden meanings through techniques such as semiotic analysis, which involves analysing the language, genre and code. As alluded by past researchers, a critical consumer can analyse and interpret media content's socio-cultural, economic, and political consequences, including underlying ideologies, social values and power dynamics (Chen et al., 2011). (b) Synthesize requires individuals to combine different ideas to create something new or to form a coherent whole. (c) Evaluation deals with an individual's ability to question and criticise media content. It is at a higher level than analysis and synthesis, as evaluation involves the ability to reconstruct and consider issues of uncertainty, such as verifying and clarifying dubious news. These evaluations include the ability to examine the reliability and credibility of media content (Lin et al., 2013).

Functional Prosuming

Functional presuming literacy involves users' capacity to create media content across various platforms (Chen et al., 2011). It can be divided into three components: (a) Prosuming skills pertain to individuals' technical proficiency in producing or generating digital content. For example, utilising applications available on devices to create digital artefacts. (b) Distribution focuses on the ability to disseminate information across various channels. (c) Production refers to the capability to replicate content. This encompasses tasks such as writing texts in digital formats and creating videos by combining images and audio (Lin et al., 2013).

Critical Prosuming

Critical prosuming literacy represents the highest level of understanding of media. A Critical prosumer can express their thoughts while engaging with others' ideas, and they consider the potential impacts of media creation and participation (Chen et al., 2011). Compared to basic prosuming, critical prosuming involves creating and engaging, like joining interactive media discussions and thinking critically about media content in different situations. "Interactive" means that people engage in a two-way exchange, speaking and listening to each other equally. (a) Creation and (b) Participation requires participants to have social skills for communicating and working with others online. A critical media user can identify deception, improve others' comments, or negotiate with others by sharing their ideas while respecting different viewpoints and beliefs (Lin et al., 2013).

The discussion of the social media literacy model led to the following hypotheses that can be proposed in this study:

H1: Functional consuming literacy positively influences critical consuming literacy among young adult social media users in Malaysia.

H2: Functional consuming literacy positively influences functional prosuming literacy among young adult social media users in Malaysia.

H3: Critical consuming literacy positively influences critical prosuming literacy among young adult social media users in Malaysia.

H4: Functional prosuming literacy positively influences critical prosuming literacy among young adult social media users in Malaysia.

The Present Studies

Social media literacy has been a topic of intense debate since the advent of the World Wide Web. The global village has interconnected people, providing access to vast amounts of information across numerous social media platforms. While interest in media literacy, particularly social media literacy, has grown worldwide, some argue that there is still limited understanding of the prevalence of instructional practices in this area. Studies focusing on secondary schools, for instance, suggest that implementation is lacking due to challenges like technological limitations (Hobbs et al., 2022), highlighting the need for further attention. This concern is underscored by research on the risks of misinformation, particularly on platforms like WhatsApp. A study on Kenyan adults found that many perceive sharing misinformation as a way to inform others about events, but they hesitate to correct it due to concerns about family dynamics, fear of embarrassment, beliefs that the misinformation hasn't spread widely, and seeing certain misinformation, like memes, as harmless (Mudavadi et al., 2024). This is echoed by research, which shows that fake news spreads more quickly, with greater diffusion speed, and exhibits more broadcast influence and person-to-person transmission compared to true news (Chiu, et al., 2022). The real dangers posed by social media, especially in specific contexts, highlight the urgent need to examine social media literacy levels among young adults. While we live in a technology-driven era and are generally tech-savvy, it does not necessarily mean we are experts in all forms of social media.

In today's reality, with multiple contexts requiring different levels of understanding, we need to cultivate a deeper knowledge to effectively navigate and critically engage with social media content. This becomes especially relevant when considering media literacy programs designed for youth, many of which lack experiential learning environments that could better support the development of social media literacy. In a study on social media literacy conducted across eight European countries, the scholars emphasize that young users share similar abilities, motivations, and behaviours related to online participation. They also stress the need to improve digital literacy research, noting that most existing programs lack empirical evaluation, which makes it unclear whether young users are able to develop the intended aspects of digital literacy in the short or long term (Wendt et al., 2023). The findings of recent studies also highlight that active participation plays a crucial role in improving learning outcomes (Zou et al., 2024) and that critical thinking dispositions are closely linked to the ability to detect fake news (Orhan, 2023). This reinforces the importance of translating theory into practice in order to fully understand the challenges of consuming and producing information on social media.

Recent studies have increasingly utilized data-driven methods to reduce misinformation on social media. For example, researchers have proposed a "competitive concern minimization" model, which seeks to decrease users' concerns about misinformation by deploying agents to share accurate information (Ni et al., 2024). Another study focuses on assessing the credibility of Twitter users to identify misinformation, leveraging user behaviour patterns and tweet propagation to assign credibility scores (Saxena et al., 2023). In addition, a study also found that enhancing skepticism, perceived accuracy, and content diagnosticity can help users better identify fake news (Alon, et al., 2024). Furthermore, the study also indicates the importance of news trustworthiness attributes in assessing students' new media literacy levels to discern fake news while interacting with media (Luo, et al., 2022). These efforts demonstrate the practical application of social media literacy to enhance its effectiveness. However, most of these studies have focused on Western contexts, leaving a gap in understanding the dynamics of Asian developing countries. This highlights the need for more research to address this gap within the local context.

The Social Media Literacy in the Malaysian Context

The incorporation of social media into daily life has significantly changed the way individuals consume and receive information. As of 2024, approximately 28.68 million Malaysians, or about 83 % of the population, are active social media users. The most popular platforms include YouTube, Instagram, TikTok, Facebook, LinkedIn, Snapchat, and Twitter. Malaysia's social media landscape is continually evolving, with platforms like TikTok and Instagram experiencing notable growth (Ashraf, 2024). This trend is generally seen as positive, as the expansion of globalization has fostered connectivity among people worldwide. The emergence of a global village has also enhanced interactivity and access to information. This is because individuals are no longer just passive consumers but actively participate in content creation and production. However, this shift raises concerns about individuals' ability to distinguish between facts and misinformation, as well as their capacity to interpret content in different contexts. The importance of these skills is further underscored by the increasing prevalence of cyber scams and misinformation. According to a news report the Malaysian Communications and Multimedia Commission (MCMC) blocked 24,277 websites from 2018 to August 2024, classifying these sites into categories such as online gambling, obscene content, copyright infringement, unregistered product sales, incitement, defamation and unlawful investment and scams (Bernama, 2024). This highlights the urgent need for individual to navigate the digital landscape thoughtfully, critically evaluate information, and engage responsibly with media content.

The intersection of social media and media literacy has emerged as a critical area of study, with past research extensively exploring their relationship. Most studies in this area have replied on survey questionnaires; however, many are limited in scope, often focusing on individual universities or primarily on university student populations. For instance, a study found that students at Universiti Kebangsaan Malaysia spend considerable time browsing the internet for entertainment. The study also emphasized the need to monitor social media usage to mitigate its negative impact on students' social lives (Chen et al., 2022). Likewise, research on social media literacy among students at a Malaysian university revealed that most students have a moderate level of new media literacy, with a positive correlation between social media use and both functional and critical prosumption. This study highlighted the necessity of critical thinking to combat the harmful effects of widespread misinformation and misleading content (Chin, Hasmah, 2019). However, since it focuses exclusively on University Tunku Abdul Rahman, its findings may not accurately reflect the broader Malaysian context.

Similarly, a study found that higher levels of media literacy among Universiti Teknologi Mara students promote more responsible information behaviour, which is essential for navigating today's information-rich digital environment (Ahmad Syakir et al., 2024). As social media serves as both an information source and a potential channel for misinformation, the ability to distinguish credible information is crucial to reducing susceptibility to fake news. Another Malaysian study highlighted a relationship between social media literacy and emotional intelligence, stressing the importance of fostering emotional intelligence in digitally savvy youth to help mitigate issues like cybercrime (Abdul Rahman et al., 2023). This underscores the growing importance of strong social media literacy skills, especially as more people rely on social media for up-to-date information. While these insights offer valuable understanding of students' perspectives on media usage, they are constrained by the single-university sample, where respondents share a similar academic background. Unlike these previous studies, this research aims to address this limitation by focusing on a broader Malaysian population, including participants from East Malaysia, thus offering a more comprehensive view of social media literacy across different regions.

Some studies take a different approach by examining digital reading practices within rural communities that have lower literacy rates. These studies highlight the necessity of enhancing digital literacy to develop digital reading skills, aiming to close the digital divide between urban and rural populations (Samsul Farid et al., 2021). This emphasis aligns with Malaysia's 10-year National Reading Decade program (2021-2030), which seeks to promote a culture of reading nationwide (Abas, 2018). Moreover, some studies investigated the digital competencies of secondary students and found that, although young people generally felt capable when handling information, they encountered difficulties with content creation and lacked problem-solving skills. Their research indicated that secondary students often struggle to evaluate the relevance and usefulness of information and to express their ideas through visual communication (Ambigapathy et al., 2020). This underscores the increasing significance of the issue.

While news literacy is significant, some scholars aptly noted that most research has predominantly focused on Western and English-speaking populations (Facciani et al., 2023). Therefore, this study is crucial in addressing this gap in the literature. By deepening our understanding of social media literacy skills among Malaysians, it can enhance the effectiveness of educational programs aimed at improving digital competencies, ultimately empowering individuals to navigate the complexities of the digital landscape in Malaysia more effectively. Furthermore, this study will adopt the social media literacy model proposed by Lin et al. (2013), providing a detailed assessment of functional consuming, critical consuming, functional prosuming, and critical prosuming within Malaysian populations. Through this comprehensive analysis, the research aims to cultivate a more informed and engaged society capable of critically engaging with digital content and effectively utilizing social media platforms.

4. Results

Descriptive Analysis

Descriptive analysis is a statistical tool used to summarise and present key features of a dataset, providing a clear and concise overview of its main characteristics (Sekaran, Bougie, 2019). This technique involves the calculation of central tendency measures, such as mean and standard deviation. Descriptive analysis helps researchers and analysts to understand the central trends, patterns, and variability within the data. Table 2 presents the descriptive statistics for all significant variables. The critical prosuming (CP) variable has the lowest mean score of 3.453, while the functional consuming (FC) variable has the highest mean score of 3.942, which is close to a rating of four. All variables have mean scores above 3.4, indicating that respondents generally agree with the item statements. The standard deviation ranges from 0.789 to 0.869, suggesting the absence of extreme values.

Table 2. Descriptive Statistics

Major Variables	*Mean*	*Standard Deviation*
Functional Consuming	3.942	0.793
Critical Consuming	3.776	0.789
Functional Prosuming	3.860	0.869
Critical Prosuming	3.453	0.836

Common Method Bias

This study employed the SmartPLS 4 version as its statistical tool (Ringle et al., 2024), using partial least squares (PLS) modeling to test the measurement and structural model since it does not require normality assumption, with survey research seldom being normally distributed (Chin et al., 2003). As all data were collected from a single source, multicollinearity may exist. Therefore, full collinearity testing was first tested in order to explore the issue of Common Method Bias, through the method enlightened by Kock and Lynn, 2012 (Kock, 2015). In this way, all variables are regressed on a common variable and if their VIF is ≤ 3.3, then there is no bias from the single source data. Table 1 shows the VIF for the analysis was less than 3.3, therefore the data of this study is not seriously clouded by single source bias.

Table 3. Full Collinearity Testing

FC	CC	FP	CP
1.229	1.654	1.525	1.724

Notes: FC – Functional Consuming, CC – Critical Consuming, FP – Functional Prosuming and CP – Critical Prosuming

Measurement Model

The model tested in this study has been developed in a manner similar to the advised 2-step approach by Anderson and Gerbingfor testing models (Anderson, Gerbing, 1988). The researchers tested the measurement model first using criteria provided by Hair et al. and Ramayah et al. to ensure the validity and reliability of instruments (Hair et al., 2022; Ramayah et al., 2018). Next, the data was assessed by a structural model which tested the hypotheses developed.

For the measurement model, the study first assessed the loadings, average variance extracted (AVE) and the composite reliability (CR). The values of loadings should be ≥0.5, the AVE should be ≥ 0.5 and the CR should be ≥ 0.7. As shown in Table 2, the AVEs are all higher than 0.5 and the CRs are all higher than 0.7. The loadings were also acceptable with all the loading more than 0.5 (Hair et el., 2022).

Then in step 2, we assessed the discriminant validity using the HTMT criterion suggested by Henseler et al. (2015) and updated by Franke and Sarstedt (Henseler et al., 2015; Franke, Sarstedt, 2019). The HTMT values should be ≤ 0.85 the stricter criterion and the mode lenient criterion is it should be ≤ 0.90. As shown in Table 3, the values of HTMT were all lower than the lenient criterion of ≤ 0.90 as such we can conclude that the respondents understood that the 4 constructs are distinct. Taken together both these validity test has shown that the measurement items are both valid and reliable.

Table 4. Measurement Model for the All Constructs

Construct	Items	Loadings	AVE	CR
Functional Consuming	FC1	0.845	0.690	0.939
	FC2	0.838		
	FC3	0.882		
	FC4	0.827		
	FC5	0.779		
	FC6	0.772		
	FC7	0.864		
Critical Consuming	CC1	0.831	0.629	0.942
	CC2	0.804		
	CC3	0.778		
	CC4	0.815		
	CC5	0.795		
	CC6	0.631		
	CC7	0.789		
	CC8	0.810		
	CC9	0.808		
	CC10	0.821		
	CC11	0.825		
Functional Prosuming	FP1	0.847	0.685	0.923
	FP2	0.828		
	FP3	0.881		
	FP4	0.860		
	FP5	0.829		
	FP6	0.755		
	FP7	0.785		
Critical Prosuming	CP1	0.788	0.626	0.936
	CP2	0.801		
	CP3	0.819		
	CP4	0.809		
	CP5	0.783		
	CP6	0.783		
	CP7	0.768		
	CP8	0.815		
	CP9	0.721		
	CP10	0.820		

Structural Model

As suggested by past researchers, this study assessed the multivariate normality skewness and kurtosis (Cain et al., 2017; Hair et al., 2022). The results showed that the data of this study collected was not multivariate normal, Mardia's multivariate skewness which greater than +-3 (β = 3.600, p< 0.01) and Mardia's multivariate kurtosis which greater than +-20 (β = 35.476, p< 0.01). As the data is not normal distribution, the researchers reported the path coefficients, the standard errors, t-values and p-values for the structural model using a 10,000-sample re-sample bootstrapping procedure (Ramayah et al. 2018). Also based on the criticism, p-values are not good criterion for testing the significance of hypothesis and suggested to use a combination of criterions such as p-values, confidence intervals and effect sizes (Hahn, Ang, 2017). Table 4 shows the summary of the criterions used in this study to test the hypotheses developed.

Table 5. Discriminant Validity (HTMT)

Constructs	1	2	3	4
1. Functional Consuming				
2. Critical Consuming	0.893			
3. Functional Prosuming	0.808	0.797		
4. Critical Prosuming	0.669	0.737	0.776	

First, the researchers tested the effect of the Functional Consuming on Critical Consuming, the R^2 was 0.697 which shows that this predictor explained 69.7 % of the variance in Critical Consuming. Functional Consuming (β = 0.835, p< 0.01), positively related to Critical Consuming, thus H1 was supported. Next, this study tested the effect on Functional Consuming on Functional Prosuming, with an R^2 of 0.558 which indicates that Functional Consuming explains 55.8 % of the variance in Functional Prosuming. Functional Consuming (β = 0.747, p< 0.01), positively related to Functional Prosuming which gives support for H2. Then, the study tested the effect of the 2 predictors on Critical Prosuming, the R^2 was 0.587 which shows that all the 2 predictors explained 58.7 % of the variance in Critical Prosuming. Functional Prosuming (β = 0.472, p< 0.01) and Critical Consuming (β = 0.347, p< 0.01) were all positively related to Critical Prosuming, thus H3 and H4 were also supported.

Table 6. Hypothesis Testing Direct Effects

Hypothesis	Relationship	Std Beta	Std Error	t-values	p-values	BCI LL	BCI UL	f2	VIF
H1	Functional Consuming → Critical Consuming	0.835	0.032	26.504	p< .001	0.774	0.878	2.301	1.000
H2	Functional Consuming → Functional Prosuming	0.747	0.049	15.222	p< .001	0.654	0.816	1.265	1.000
H3	Functional Prosuming → Critical Prosuming	0.472	0.074	6.406	p< .001	0.343	0.585	0.241	2.238
H4	Critical Consuming → Critical Prosuming	0.347	0.080	4.341	p< .001	0.217	0.479	0.130	2.238

Notes: We use 90 % confidence interval with a bootstrapping of 10,000

The findings indicate that Malaysians have moderate social media literacy skills, with mean scores ranging from 3.7 to 3.9. However, critical prosuming shows a slightly lower mean score of

3.4 compared to the other three variables. As the highest level of social media literacy, critical prosuming requires the ability to create and participate meaningfully within diverse social media contexts. Past scholars have supported the idea that critical prosuming skills are influenced by both critical consuming and functional prosuming skills (Lin et al., 2013). Therefore, strengthening these skills could contribute to improved critical prosuming abilities among Malaysians.

The widespread dissemination of technology-related misinformation on social media has become a pressing concern for security experts, likely due to users' challenges in discerning underlying meanings in social media content, which increases susceptibility to fake news. This issue is particularly significant during crises, when every piece of information is crucial for public response (Yeoh, 2024). Notably, during the pandemic, the amount of fake news circulated was approximately three times higher than verified news (Chee, 2023), underscoring the need for strong social media literacy to navigate the vast amount of information available on social platforms."

In addition, the findings also indicate that all hypotheses are accepted. Specifically, hypothesis 1 suggests that functional consuming literacy is positively correlated with critical consuming literacy. Hypothesis 2 posits that functional consuming is positively related to functional prosuming, while hypotheses 3 and 4 are closely associated to critical prosuming skill.

The results suggest a strong correlation between high levels of functional consumption and critical consumption, implying that these skills are essential for critically evaluating, synthesizing, and analysing social media content. Although Malaysia has approximately 33.59 million internet users (Data Reportal, 2024, February 23), indicating a certain level of media usage skills, Associate Professor Dr. Mohd Khairie expresses concerns about users' ability to analyse, evaluate, and use media ethically (Basir, 2024). These concerns are further underscored by a report showing that Malaysian e-commerce crime in 2023 resulted in RM204 million in losses, with online fraud alone accounting for 34,397 cases and RM1.2 billion in damages (Camoens, 2024).

This situation highlights the urgent need for improved media literacy among Malaysian internet users, particularly in their ability to navigate the digital landscape responsibly. This is supported by past researchers, who explain that functional consumption involves not only accessing recently generated media content but also fully comprehending its conveyed significance, which requires cultivating a comprehensive array of technical proficiencies (Hilyati et al., 2024). Engaging in functional consumption necessitates the ability to actively and analytically interact with content, fostering a more knowledgeable and discerning media consumer in the digital era. This foundational skill set is crucial before individuals can effectively engage in critical consumption, analysis, synthesis, and evaluation of social media content. Therefore, the findings recommend prioritizing the enhancement of functional consumption skills while also focusing on strengthening critical consumption.

The second hypothesis posits that functional consuming literacy can positively influence functional prosuming literacy. The skills involved in understanding and consuming media encompass not only the ability to create accounts on social media but also to navigate its functionalities effectively. Additionally, these consuming skills include reading and writing proficiency, which enable users to comprehend and utilize various forms of media (Chen et al., 2011). Some argue that consumption skills should also integrate critical thinking, allowing individuals to connect meaningfully with their social environment and context on social media (Polanco-Levican, Salvo-Garrido, 2023). Thus, it becomes evident that functional consuming is closely linked to functional prosuming skills, which involve the ability to produce, distribute, and engage in both creating and consuming content.

This concept underscores the active role users play in the content creation process, emphasizing that they are not merely passive consumers but also active contributors to the media landscape. Supporting this view, some scholars found that functional consumption and functional prosuming can influence each other interchangeably among Turkish students (Tugtekin, Koc, 2019). This suggests that the ability to consume is a prerequisite for critical media literacy. Indeed, a media prosumer is both a producer and a consumer when an individual creates or revises content. When media consumption is integrated into the process of media prosuming, it encompasses production and participation (Chen et al, 2011). Therefore, this research suggests that cultivating strong functional consuming skills can enhance functional prosuming skills among young adults in the country.

The third hypothesis posits that critical consuming literacy can positively influence critical prosuming literacy. Critical consuming, which involves evaluating, synthesising, and analysing

information, significantly enhances an individual's ability to engage thoughtfully on social media. Critical prosuming is one of the most complex and essential aspects of media literacy, as reflected in indicators of participation and creation (Koc, Tugtekin, 2016). Participation in content creation is not a passive endeavour; rather, it is an active process that demands a higher level of critical engagement from individuals, enabling them to contribute to discussions and critiques within new media environments. This engagement requires the ability to produce original media content while incorporating socio-cultural values and ideological issues. Such participation also necessitates social skills for effective communication and interaction online. Critical prosumption has been shown to significantly impact learning outcomes among Vietnamese students (Tran-Duong, 2023). Hence, it is crucial to train young adults to evaluate and analyse the posts or articles they encounter on social media, rather than merely following others or passively receiving information, which may contribute to the spread of fake news. By emphasising critical prosuming skills, this study highlights the importance of proactive content creation that goes beyond simply sharing or forwarding information. Critical media users possess the ability to identify deception and negotiate various ideas that may present differing viewpoints (Lin et al., 2013).

The last hypothesis suggests that the ability to produce and distribute content on social media significantly enhances one's capacity to engage critically with the platform. This ongoing process encompasses both functional prosuming and critical prosuming skills. The relationship between these skills suggests that the ability to create, modify, and share content (functional prosuming) leads to a deeper, more critical engagement with media. As users become more proficient in content creation and distribution, they tend to develop a more nuanced understanding of media operations, which encourages them to critically evaluate the content they both consume and produce. In addition, critical prosuming represents higher-order thinking, designed to help individuals engage in reflective reasoning and sound judgment to address various situations (Zhao et al., 2024). This is especially relevant in the context of social media, where diverse viewpoints can easily mislead or distort understanding. Critical prosuming involves identifying hidden meanings within texts, requiring an understanding of the social and cultural contexts influencing content creators. In this regard, research and comparative analysis skills are essential. As scholars emphasize, it is crucial to incorporate design-based studies to develop effective curricula aimed at fostering critical prosuming, thereby enhancing new media literacy among students in Singapore (Chen et al., 2018). Consequently, developing foundational functional consuming skills is vital before individuals can effectively engage in critical prosuming. Mastering functional consumption serves as the groundwork for users to critically produce and evaluate the content they encounter in the digital landscape.

5. Conclusion

This study underscores the significance of social media literacy skills, which encompass a spectrum from functional consuming to functional and critical consuming, as well as from functional prosuming to critical prosuming, and from critical consuming to critical prosuming. These skills are closely interconnected and essential for tackling the rising tide of misinformation in Malaysia. The surge in fake news poses a serious threat that demands immediate action to prevent its proliferation, as unchecked misinformation could undermine democracy in the country. A growing concern is that citizen can no longer rely on the authority to effectively curb fake news. The government's attempts during Najib Razak's administration were unsuccessful due to issues of trust (Neo, 2021). This scenario highlights the urgent need to enhance social media literacy skills, empowering individuals to become discerning consumers of information. Higher new media literacy has been associated with greater aesthetic interest and reduced confusion, and vice versa, suggesting that social media literacy is necessary for aesthetic experience and audience participation, particularly in a social media context where individuals encounter diverse types of media content, necessitating the ability to differentiate and negotiate these contents (Xu et al., 2022).

To address these challenges, integrating social media literacy into university curricula is crucial. For example, teaching functional skills related to tools like Google and using social media platforms for assignments can align educational goals with Malaysia's vision of becoming a technology-driven nation by 2030 (Tan, 2023). Additionally, the rise of social media has coincided with the spread of misinformation, necessitating a greater emphasis on critical thinking skills within educational programs (Gilmour, 2024). Incorporating appropriate assignments and adapting pedagogical tools are vital for reinforcing these skills. Furthermore, universities could

enhance their efforts by organizing workshops and seminars focused on media literacy, inviting experts to engage with young adult, and establishing partnerships with technology companies for practical learning experiences. By adopting a comprehensive approach to social media literacy, educational institutions can empower young adult to navigate the digital landscape more responsibly and critically, ultimately contributing to a more informed and resilient society.

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Appendix

Survey questionnaire (Adapted from Tran-Duong, 2023)

Functional Consuming

FC1. I know how to use search tools to get information on social media platforms.
FC2. I am good at catching up with the changes in social media.
FC3. It is easy for me to use various social media environments to reach information.
FC4. I realise explicit and implicit social media messages.
FC5. I notice social media content containing mobbing and violence.
FC6. I understand social media content's political, economic, and social dimensions.
FC7. I perceive different opinions and thoughts in social media.

Critical Consuming

CC1. I can distinguish different functions of social media (communication, entertainment, etc.).
CC2. I can determine whether or not social media contents have commercial messages.
CC3. I classify social media messages based on their producers, types, purposes, etc.
CC4. I can compare news and information across different social media environments.
CC5. I can combine social media messages with my own opinions.
CC6. When choosing which social media content to use, I consider the social media rating system.
CC7. It is easy for me to make decisions about the accuracy of social media messages.
CC8. I analyse the positive and negative effects of social media content on individuals.
CC9. I can evaluate social media regarding legal and ethical rules (copyright, human rights, etc.)
CC10. I can assess social media regarding credibility, reliability, objectivity, and currency.
CC11. I managed to fend myself from the risks and consequences caused by social media content.

Functional Prosuming

FP1. It is easy for me to create user accounts and profiles in social media environments.
FP2. I can use the hardware to develop social media content (text, images, video, etc.)
FP3. I can use software to develop social media content (text, images, video, etc.)

FP4. I can use basic operating tools (buttons, hyperlinks, file transfer, etc.) in social media.

FP5. I am good at sharing digital media content and messages on social media.

FP6. I can make contributions or comments to social media content shared by others.

FP7. I rate or review social media content based on my interests and likes.

Critical Prosuming

CP1. I manage to influence others' opinions by participating in social media environments.

CP2. I can contribute to social media by reviewing current matters from different perspectives (social, economic, ideological, etc.)

CP3. I collaborate and interact with diverse social media users towards a common purpose.

CP4. It is easy for me to construct an online identity consistent with real personal characteristics.

CP5. I can discuss and comment to inform or direct people on social media.

CP6. I am skilled at designing social media contents that reflect critical thinking on certain matters.

CP7. I am good at producing opposite or alternative social media content.

CP8. I produce social media content that respects people's different ideas and private lives.

CP9. I must create social media content that complies with legal and ethical rules.

CP10. I can develop original visual and textual social media content (video clips, web pages, etc.).

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Navigating the Scholarly Landscape: An Analysis of Information Literacy Skills among Students at American University in the Emirates, Dubai

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Abstract

In the dynamic landscape of academia, the cultivation of robust information literacy skills of the students at American University in the Emirates. This information endeavors to conduct a comprehensive comparative analysis of the trends and evaluation of information literacy skills at the one of prominent university in the United Arab Emirates. This study aims to investigate the current state of information literacy skills among students, exploring the various dimensions such as information retrieval, searching skills, critical evaluation of sources, confidence level, and proficiency in citation and referencing skills. A mixed-methods approach, including surveys, interviews, and document analysis, seeks to identify the strengths, challenges, and potential areas for improvement in information literacy. By examining the institutional and library support structures, training programs, and academic cultures, this study aims to provide insights into the factors influencing the development of information literacy skills in these academic settings. Ultimately, this information contributes to the broader discourse on enhancing information literacy in higher education institutions and provides evidence-based recommendations for fostering an information-intensive environment. The findings of this study can inform institutional policies, and training initiatives, thereby enriching the information capabilities of academic communities at the universities and beyond.

Keywords: information literacy, academic libraries, information awareness, graduate students, UAE.

1. Introduction

Information literacy abilities encompass the ability to recognize, locate, assess, utilize, generate, store, and categorize information. It is a concept that has suffered from terminological confusion and has not been adequately integrated with information behavior or practices (Purnell, et al., 2020). The development of information literacy faces challenges, but its value remains relevant Some key skills that an information literate person should possess in the 21st century include the ability to evaluate information, understand scholarly work, and navigate complex resources. Information literacy is often assessed through multiple-choice tests that target different groups such as pupils, university students, teachers, and researchers. It is important to integrate information literacy skill building into the curriculum and teach it as a foundational learning component (Encheva, et al., 2020). Librarians can collaborate to integrate information literacy into courses and develop exercises and assignments to advance an information literacy curriculum. The Association of College & Research Libraries' Information Literacy Framework can be used to identify skill gaps and incorporate twenty-first-century literacy skills into information literacy

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modules. Instruction librarians play a crucial role in promoting and teaching reading comprehension as part of information literacy (LeMire, et al., 2021).

Information literacy skills are important for students in higher education. The students recognize the significance of information literacy and incorporate it into their learning process. However, there is a perception that students lack these skills, leading to a need for libraries to implement information literacy training in their courses (Okeji, et al, 2020). Studies have shown that there are differences in information literacy skills among students, with many struggling in areas such as catalog searching, information use, and formulation of search strategies. It is crucial for students to develop information literacy skills to succeed in their academic work and research. Librarians play a key role in teaching information literacy, and collaboration between students can enhance instruction and improve student learning outcomes. Graduate students need training in information literacy skills such as information management, knowledge management, and scholarly communication (Majid et al., 2020). The library plays a role in fostering information literacy skills by providing virtual learning landscapes and interactive modules on topics related to information literacy. There is a need for information literacy skills among graduate students to play a crucial role in fostering these skills. Libraries provide resources and programs to support information literacy development. Information literacy skills are essential for students pursuing advanced degrees in various fields (Svenssonet al., 2022). Several studies have focused on enhancing information literacy through training programs and interventions. This study aims to develop a theoretical framework for measuring educational information literacy and evaluate the efficacy of online resources and services and increasing information literacy levels among participants.

The American University in the Emirates (AUE), established in 2006, holds a unique position as a pioneering institution in the United Arab Emirates (UAE) educational landscape. AUE has continually expanded its academic offerings and campus facilities, striving to meet the diverse needs of its student body while maintaining a strong emphasis on academic excellence and innovation. AUE stands as a beacon of higher education in the region, embodying a rich history of academic achievement and cultural diversity within the dynamic educational landscape of the UAE. The AUE library fosters information literacy among its students through diverse activities designed to improve their capacity to access, assess, and proficiently utilize information resources. To facilitate students' acquisition of information literacy skills, many forms of assistance have been incorporated through several means.

Integration into the Curriculum: AUE incorporates information literacy elements into its academic program across multiple fields. Faculty integrate information literacy abilities into coursework, assignments, and research projects, offering students tangible chances to cultivate and employ these skills in real-life situations.

Library Workshops and Training Sessions: The university's library offers workshops, training sessions, and orientation programs to educate students on information literacy principles and tools. These courses provide instruction on database searching, citation management, academic integrity, and critical evaluation of sources. They aim to educate students with the essential skills needed to efficiently traverse the information landscape.

Online Resources and Tutorials: The library offers a variety of online materials and lessons to help students to enhance their information literacy skills. The resources provided encompass a wide range of materials such as research guides, instructional videos, online modules, and interactive tutorials that address different areas of information literacy.

Librarian Support: AUE's library provides individualized aid and direction to students through its group of expert librarians. Librarians are accessible to offer research support, address reference inquiries, provide individualized consultations, and conduct seminars customized to meet students' unique needs and academic criteria.

Embedded Librarian Programs: AUE offers courses that may include embedded librarian programs, in which librarians work closely with teachers to deliver information literacy teaching inside the framework of a specific course or assignment. This methodology facilitates the cultivation of information literacy competencies among students within a subject-specific framework, hence augmenting their capacity to effectively employ these competencies in their academic endeavors.

AUE conducts frequent assessments and evaluations of students' information literacy skills to gauge their proficiency and pinpoint areas that need improvement. The institution can assess the performance of its information literacy activities and make appropriate interventions by using

assessment tools such as pre- and post-tests, questionnaires, research assignments, and rubric-based assessments. AUE aspires to foster a culture of information literacy among its students by implementing these tactics. This will enable them to develop critical thinking skills, become lifelong learners, and responsibly utilize information in a rapidly evolving and linked global environment.

The review of related literature provides valuable insights into the current state of research on information literacy skills among students in the Middle East, offering a foundation for understanding the challenges and opportunities for promoting information literacy in higher education contexts.

(Alainati, Al-Hunaiyyan, 2024) examine the importance of 21st century skills on a worldwide scale and specifically in Gulf Cooperation Council (GCC) countries in the context of a knowledge-driven economy. The study evaluates current educational methods and the incorporation of essential skills such as critical thinking and digital literacy in the GCC region using a literature analysis and qualitative interviews with educators and officials. The initial results underscore the necessity of educational restructuring to foster these abilities, emphasizing difficulties such as aligning the curriculum and providing adequate teacher training (Becker, 2018) contests prevailing misunderstandings on information literacy in the digital era, highlighting the significance of discerning thinking and assessment abilities in traversing extensive information sources (Al-Qallaf, Aljiran, 2022) examines the proficiency of high school students in Kuwait in information literacy (IL) skills, as well as the practices of educators in this regard.

Three international private high schools took part, employing a blended methodology that adhered to IL criteria. The results demonstrate conformity to IL requirements and student acquisition of knowledge. The study provides valuable insights for the development of IL programs and identifies potential areas for future research (Al-Aufi, Al-Azri, 2013). evaluate the information literacy proficiency of senior students at Sultan Qaboos University by employing the Big6 model.

The results indicated a strong level of expertise in information literacy skills, namely around synthesizing knowledge. However, skills related to finding and accessing information were found to be less developed. Slight variations in skills were noted depending on specialization, gender, proficiency in English, and computer skills. The study emphasizes the lack of literature on information literacy in the Arab world and serves as the initial empirical examination of information literacy skills among university students in Oman (Shana, Ishtaiwa, 2013) evaluates the information literacy (IL) abilities necessary for the transfer to university in the United Arab Emirates (UAE).

The study investigates the information literacy (IL) levels and attitudes of incoming first-year students from three private universities: Ajman University of Science and Technology (AUST), Al Ain University of Science and Technology (AAU), and Al Hosn University (AHU). A total of ninety students enrolled in first-year general education classes took part in the study. Among them, Group 2, which consisted of students from AAU, received information literacy (IL) training as a component of their research skills course. Preliminary assessments identified areas of skill deficiency in all groups, whereas subsequent assessments shown notable enhancements in information literacy capabilities among the trained participants. The results emphasize the necessity of customized educational programs to target information literacy deficiencies among incoming students (Moyo, Mavodza, 2016) conduct a comparative analysis of information literacy (IL) provision for university students in South Africa (SA) and the United Arab Emirates (UAE) at the undergraduate and graduate levels. The study aims to provide insights for the development of effective IL programs that can support teaching and learning. The study uncovers differences in the provision of information literacy (IL) inside and across academic fields, revealing shortcomings in local research endeavors.

This study aims to enhance comprehension of the comprehension and execution of IL providing, utilizing ACRL standards as a guiding framework, in two diverse locations of the world (Martin, 2006) examines the increasing prevalence of online instruction in developing information literacy skills, specifically in higher education on a global scale. The article centers around Zayed University in the UAE, which has successfully shifted to online instruction, a distinctive undertaking inside the Arab region. The study presents an online course on information literacy and investigates the impact of culture, educational backgrounds, and language skills, specifically on female Emirati students. Guidelines are offered for the efficient implementation of online instructional design in this situation (Al-Qallaf, 2020) focuses on the lack of research regarding information literacy skills in graduate programs. The purpose of this study is to evaluate the

information literacy abilities of new students in the information studies graduate program at Kuwait University. The results demonstrate a rise in the average score of students, namely in their understanding of databases, search tactics, and accessing sources. The results provide guidance for creating a flexible information literacy education model that can be used in many educational settings.

This model offers a structure for incorporating information literacy instruction into graduate programs (Martin, et al., 2010) conducted a study at Zayed University in the UAE to assess the effectiveness of Infoasis, a web-based tutorial aimed at improving information literacy skills among Arab students. The study evaluates the pertinence and usefulness of Infoasis to students and examines the elements that influence its utilization. The survey results demonstrate that students consider Infoasis to be pertinent and beneficial for their academic pursuits, mostly because of its customized interface catering to the specific needs of undergraduate Arab students (Pullman, 2016) conducted a study and explore the lack of knowledge regarding Qatari students' experiences with information literacy by providing insights obtained from first-semester students at Carnegie Mellon University. The research finding indicates that Qatari students in their first year of college possess a strong understanding of information literacy and demonstrate favorable attitudes towards it.

The study highlights the significance of customizing instructional design to meet the specific information requirements of the local context, promoting thoughtful teaching, and learning methods, and refraining from predetermined assumptions about students. In summary, it highlights the need of information literacy for students in Qatar and proposes potential areas for future investigation (Arman, Abukhayran, 2019) study examined the information literacy level of graduate students at Al-Quds University in Palestine. The findings indicated a moderate level of information literacy, with notable variations depending on gender, area of specialization, academic level, and frequency of library visits. Male students, specifically those specializing in Social Sciences, freshmen, and students who frequently visit the library, exhibited elevated levels of information literacy. The study proposes that university faculties should give priority to enhancing the information literacy skills of graduate students by implementing focused courses and activities.

2. Material and methods

This study employs a mixed methods approach to research to thoroughly examine the scope of information literacy (IL) among students at the American University in the Emirates. The design of the study incorporates both quantitative and qualitative data gathering approaches to provide a comprehensive comprehension of students' information literacy skills, behaviors, and perceptions. Descriptive research is appropriate for this study as it aims to describe the characteristics of the student population in terms of their information literacy skills and satisfaction levels. Quantitative data is obtained by using a well-organized survey questionnaire that evaluates information literacy abilities and satisfaction with university courses. Qualitative insights are acquired by conducting interviews and focus groups with students of undergraduate and post graduate students across the seven colleges. Data integration enables a thorough comprehension of information literacy dynamics. The adherence to ethical principles is rigorous, and the recognition of limits includes potential biases and restraints on generalizability. The total number of respondents for the survey was 196, consisting of 133 undergraduate students and 63 graduate students. This sample size is considered efficient for the study as it provides enough responses to conduct meaningful statistical analyses. Given the total student population at AUE, the sample size ensures that the findings are representative and generalizable to the wider student body.

The study utilized a convenience sampling technique to collect data. This method was chosen due to its practicality and ease of implementation within the university setting. Students who were available and willing to participate were included in the sample. While convenience sampling has limitations in terms of generalizability, it was deemed appropriate for the exploratory nature of this study. Future research could employ more rigorous sampling techniques to enhance the representativeness of the findings. This study aims to comprehensively investigate the level of information literacy among undergraduate and postgraduate students at the different colleges of American University in the Emirates, Dubai. The research specifically aims to evaluate the levels of information literacy, identify the elements that influence it, and analyze the efficiency of current practices of information literacy and level of satisfaction of students. However, it is crucial to recognize specific constraints. Firstly, the study's conclusions may be limited by the exclusive focus on the university academic setting, which restricts the capacity to apply the results to other

institutions or broader contexts. The limitations in time and resources are restricting the extent of investigation and full coverage of all pertinent issues. The objective of this study is to offer relevant perspectives on information literacy instruction and research support programs at AUE.

This study aims to delve into the information literacy landscape among undergraduate and graduate students at the American University in the Emirates (AUE), UAE. Specifically, the objectives of this research endeavor are as follows:

1. To explore the confidence level of information literacy skills and initiatives and students' satisfaction towards information literacy provided by library.
2. To determine the ability to evaluate the gathered information between undergraduates and postgraduates' students.
3. To determine significant difference in the frequency of using citation and referencing techniques between undergraduates and postgraduates' students.

To determine significant difference in the comfort level of using technology tools for information retrieval between undergraduates and postgraduates' students.

3. Discussion

Table 1. Demographic details of participants

Name of the College, AUE	Male (number and %)	Female (number and %)	Total (number and %)
College of Business Administration	17 (45.83)	13 (54.17)	30 (15.30)
College of Media and Mass Communications	12 (52.17)	11 (47.83)	23 (11.73)
College of Security and Global Studies	16 (53.33)	14 (46.67)	30 (15.30)
College of Computer Information Technology	14 (60.87)	9 (39.13)	23 (11.73)
College of Design	21 (61.76)	13 (38.24)	34 (17.34)
College of Law	19 (55.88)	15 (44.12)	34 (17.34)
College of Education	13 (59.09)	9 (40.91)	22 (11.22)
Total	112 (57.14)	84 (42.86)	196 (100)

The table provides a detailed analysis of the distribution of individuals based on their gender and college affiliation at the American University in the Emirates. The data displays the count and proportion of male and female participants in each college, with the overall participation count. Observations indicate that there are different gender distributions among institutions, with certain colleges, such Computer Information Technology, having a higher proportion of male students, while others have a more equal representation of genders. In all, the male participants make up 112 (57.14 %) of the total, while the female participants make up 84 (42.86 %). Undergraduate (UG) students represent the majority, constituting 133 (68.37 %) of the total participants, while Postgraduate (PG) students, on the other hand, comprise 63 (31.63 %) of the participant pool. This demographic information guides further examination of information literacy levels and emphasizes the necessity for focused treatments that consider gender dynamics.

This study aims to evaluate the information literacy skills of students at the American University in the Emirates (AUE), addressing a research gap in the Arab world. By using statistical analysis to measure student satisfaction with information literacy instruction, the research provides objective insights for improving educational practices. By employing statistical tools, we can objectively measure the effectiveness of information literacy instruction and quantify students' satisfaction levels with different components of the instruction. For instance, by calculating mean values and standard deviations for responses related to satisfaction with instruction on searching for information, evaluating information sources, referencing and citation, and research ethics and plagiarism, we can identify which areas are perceived as most and least effective by students. The findings will guide targeted interventions to enhance student research skills and academic success and serve as a benchmark for other regional institutions.

Table 2. Confidence level of searching information among students

Confidence Level of Searching Information	Undergraduate (UG) (number and %)	Postgraduate (PG) (number and %)	Total (number and %)
Very Confident	74 (55.63)	30 (47.62)	104 (53.57)
Confident	60 (45.11)	25 (39.68)	85 (43.37)
Neutral	20 (15.03)	5 (7.94)	25 (12.76)
Not Confident	10 (7.51)	3 (4.76)	13 (6.63)
Not at all Confident	3 (2.25)	1 (1.59)	4 (2.04)
Total	133 (100)	63 (100)	196 (100)

The above Table 2 provides insights into participants' confidence levels in information searching abilities across academic levels. Among undergraduates, the highest proportion, 74 (55.63 %), feel "Very Confident," while 60 (45.11 %) express confidence. Notably, a smaller percentage, 20 (15.03 %), report feeling "Neutral," with even fewer indicating "Not Confident" (10; 7.51 %) and "Not at all Confident" (3; 2.25 %). For postgraduates, 30 (47.62 %) report feeling "Very Confident," followed by 25 (39.6 %) expressing confidence. Fewer postgraduates indicate feeling "Neutral" (5; 7.94 %), "Not Confident" (3; 4.76 %), or "Not at all Confident" (1; 1.59 %). Across both academic levels, the highest percentage of participants feel "Very Confident," with undergraduates exhibiting slightly higher confidence levels. Conversely, the lowest percentages correspond to those expressing "Not Confident" and "Not at all Confident" responses, indicating a generally positive outlook on information literacy skills.

Objective: To determine whether there is a significant difference in the confidence levels of undergraduates and postgraduates in searching for information.

Based on above objective, the following hypothesis is constructed:

Null Hypothesis (H0): The confidence level in searching for information is independent of the educational level.

V/s

Alternative Hypothesis (H1): The confidence level in searching for information is dependent on the educational level.

Understanding the confidence levels in information searching across different educational levels can provide insights into potential gaps in information literacy. This information can guide educational institutions in tailoring their instructional strategies to better support students in developing effective research skills. The chi-square test of independence is used to evaluate if there is a significant association between educational level (undergraduate vs. postgraduate) and confidence levels in searching for information. The chi-square test yielded a chi-square statistic of 1.0859 with 4 degrees of freedom and a p-value of 0.8965. The expected frequencies were calculated based on the observed data, and the comparison between observed and expected frequencies showed no significant deviation. The high p-value (0.8965) indicates that there is no significant difference in the confidence levels of undergraduates and postgraduates in searching for information. This suggests that confidence in information searching is not influenced by whether a student is an undergraduate or a postgraduate. Therefore, the null hypothesis, which states that confidence levels are independent of educational level, cannot be rejected. This result implies that both undergraduates and postgraduates share similar confidence levels when it comes to searching for information. These findings can inform educational strategies aimed at improving information literacy, ensuring that support is equally provided across different educational levels.

The Table 3 offers an analysis of participants' perceived skill levels in critically evaluating the credibility and reliability of online sources, segmented by academic level. Among undergraduates, the minority, 1 (0.75 %), express feeling "Not Skilled at All" in this aspect, followed by 3 (2.25 %) indicating being "Not Very Skilled." A larger proportion report feeling "Somewhat Skilled" (10; 7.51%), followed by "Skilled" (50; 37.59 %) and "Very Skilled" (69; 52.87 %).

In comparison, among postgraduates, none report feeling "Not Skilled at All," while 1 (1.59%) express being "Not Very Skilled." A few postgraduates indicate feeling "Somewhat Skilled" (2; 3.17 %), followed by "Skilled" (20; 31.75 %) and the majority feeling "Very Skilled" (40; 63.49 %). Overall, the data illustrate a predominantly positive perception of critical evaluation skills among participants, with the highest percentage indicating feeling "Very Skilled" in both undergraduate and postgraduate categories. Conversely, the lowest percentages correspond to those indicating

feeling "Not Skilled at All" or "Not Very Skilled," highlighting a generally favorable outlook on participants' abilities in critically evaluating online sources.

Table 3. Ability to evaluate the Information among the students

Ability to evaluate the Information	Undergraduate (UG) (number and %)	Postgraduate (PG) (number and %)	Total (number and %)
Not Skilled at All	1 (0.75)	0 (0)	1(0.75)
Not Very Skilled	3 (2.25)	1 (1.59)	4 (2.04)
Somewhat Skilled	10 (7.51)	2 (3.17)	12 (6.12)
Skilled	50 (37.59)	20 (31.75)	70 (35.71)
Very Skilled	69 (51.87)	40 (63.4)	109 (55.61)
Total	133 (67.85)	63 (32.14)	196 (100)

Objective: To determine whether there is a significant difference in the ability to evaluate information between undergraduates and postgraduates.

Based on above objective, the following hypothesis is constructed:

Null Hypothesis (H0): The ability to evaluate information is independent of the educational level.

V/s

Alternative Hypothesis (H1): The ability to evaluate information is dependent on the educational level.

Evaluating the ability to assess information accurately is crucial for academic success and informed decision-making. By identifying any significant differences in this ability across educational levels, institutions can better allocate resources and support to enhance information evaluation skills for all students. The chi-square test of independence is used to determine if there is a statistically significant association between educational level (undergraduate vs. postgraduate) and the ability to evaluate information. The chi-square test yielded a chi-square statistic of 3.3309 with 4 degrees of freedom and a p-value of 0.5040. The expected frequencies were calculated based on the observed data, and no significant deviation was found between the observed and expected frequencies. The high p-value (0.5040) indicates that there is no significant difference in the ability to evaluate information between undergraduates and postgraduates. This suggests that the ability to evaluate information is not influenced by whether a student is an undergraduate or a postgraduate. Therefore, the null hypothesis, which states that the ability to evaluate information is independent of educational level, cannot be rejected. These findings imply that both undergraduates and postgraduates share similar levels of skill in evaluating information. This insight can help inform educational strategies aimed at enhancing information literacy, ensuring that both groups receive adequate support to improve their evaluation skills.

The Table 4 illustrates participants' self-reported frequency of correctly using citation and referencing techniques in their academic work, divided by academic level. Among undergraduates, the majority (49; 36.84 %) claim to "Always" use these techniques correctly, followed by 45 (33.83 %) indicating "Often." A smaller percentage report "Sometimes" (30; 22.55 %), "Rarely" (8; 6.01 %), or "Never" (1; 0.75 %). In comparison, among postgraduates, a higher proportion, 25 (39.68 %), state they "Often" use these techniques correctly, followed by 17 (26.98 %) indicating "Always." A smaller percentage report "Sometimes" (15; 23.81 %) or "Rarely" (5; 7.94 %), while only 1 (1.59 %) report "Never." Overall, the data demonstrate a generally positive trend, with the highest percentage indicating "Always" correctly using citation and referencing techniques among undergraduates and "Often" among postgraduates. The lowest percentages correspond to those indicating "Never" or "Rarely," suggesting a relatively low frequency of incorrect usage among participants.

Table 4. Frequency of using citation and referencing techniques among students

Frequency of using citation and referencing techniques	Undergraduate (UG) (number and %)	Postgraduate (PG) (number and %)	Total (number and %)
Sometimes	30 (22.55)	15 (23.81)	45 (22.96)
Rarely	8 (6.01)	5 (7.94)	13 (6.63)

Frequency of using citation and referencing techniques	Undergraduate (UG) (number and %)	Postgraduate (PG) (number and %)	Total (number and %)
Often	45 (33.83)	25 (39.68)	70 (35.71)
Never	1 (0.75)	1 (1.59)	2 (1.02)
Always	49 (36.84)	17 (26.98)	66 (34.18)
Total	133 (67.85)	63 (32.14)	196 (100)

Objective: To determine whether there is a significant difference in the frequency of using citation and referencing techniques between undergraduates and postgraduates.

Based on above objective, the following hypothesis is constructed:

Null Hypothesis (H0): The frequency of using citation and referencing techniques is independent of the educational level.

V/s

Alternative Hypothesis (H1): The frequency of using citation and referencing techniques is dependent on the educational level.

Understanding the frequency of using citation and referencing techniques across different educational levels can provide insights into students' academic habits and their adherence to academic integrity standards. This information can help educational institutions develop targeted interventions to improve citation practices. The chi-square test of independence is used to determine if there is a statistically significant association between educational level (undergraduate vs. postgraduate) and the frequency of using citation and referencing techniques. The chi-square test yielded a chi-square statistic of 2.2027 with 4 degrees of freedom and a p-value of 0.6985. The expected frequencies were calculated based on the observed data, and no significant deviation was found between the observed and expected frequencies. The high p-value (0.6985) indicates that there is no significant difference in the frequency of using citation and referencing techniques between undergraduates and postgraduates. This suggests that the frequency of using citation and referencing techniques is not influenced by whether a student is an undergraduate or a postgraduate.

Table 5. Comfort Level of using technology tools for information retrieval among the students

Comfort Level of using technology tools for information retrieval	Undergraduate (UG) (number and %)	Postgraduate (PG) (number and %)	Total (number and %)
Neutral	22 (16.54)	11 (17.46)	33 (16.84)
Comfortable	50 (37.59)	20 (31.75)	70 (35.71)
Very comfortable	45 (33.83)	20 (31.75)	65 (33.16)
Uncomfortable	12 (9.02)	9 (14.29)	21 (10.71)
Very uncomfortable	4 (3.01)	3 (4.76)	7 (3.57)
Total	133 (67.85)	63 (32.14)	196 (100)

Therefore, the null hypothesis, which states that the frequency of using citation and referencing techniques is independent of educational level, cannot be rejected. These findings imply that both undergraduates and postgraduates exhibit similar behaviors in using citation and referencing techniques. This insight can help inform educational strategies aimed at promoting consistent and effective citation practices across different educational levels.

The Table 5 illustrates participants' self-reported comfort levels with using technology tools and software for information retrieval and analysis, categorized by academic level. Among undergraduates, the highest percentage (50; 37.59 %) indicate feeling "Comfortable," followed by 45 (33.83 %) reporting feeling "Very comfortable." A smaller percentage feel "Neutral" (22; 16.54 %), "Uncomfortable" (12; 9.02 %), or "Very uncomfortable" (4; 3.01 %). In comparison, among postgraduates, a higher proportion (20; 31.75 %) indicate feeling "Comfortable," followed by 20 (31.75 %) feeling "Very comfortable." A smaller percentage feel "Neutral" (11; 17.46 %), "Uncomfortable" (9; 14.29 %), or "Very uncomfortable" (3; 4.76 %). Overall, the data suggest a generally positive trend, with the highest percentage indicating feeling "Comfortable" among both undergraduates and postgraduates. The lowest percentages correspond to those indicating feeling

"Very uncomfortable," indicating a relatively low discomfort level with technology tools and software among participants.

Objective: To determine whether there is a significant difference in the comfort level of using technology tools for information retrieval between undergraduates and postgraduates.

Null Hypothesis (H0): The comfort level of using technology tools for information retrieval is independent of the educational level.

V/s

Alternative Hypothesis (H1): The comfort level of using technology tools for information retrieval is dependent on the educational level.

Understanding the comfort level with technology tools across different educational levels can provide insights into students' technological proficiency and highlight areas where additional training or support may be needed. This information can help educational institutions enhance the technological readiness of their students. The chi-square test of independence is used to determine if there is a statistically significant association between educational level (undergraduate vs. postgraduate) and the comfort level in using technology tools for information retrieval. The chi-square test yielded a chi-square statistic of 1.9607 with 4 degrees of freedom and a p-value of 0.7429. The expected frequencies were calculated based on the observed data, and no significant deviation was found between the observed and expected frequencies. The high p-value (0.7429) indicates that there is no significant difference in the comfort level of using technology tools for information retrieval between undergraduates and postgraduates.

Table 6. How satisfied were you getting the information literacy instruction?

Satisfaction Level	Searching for Information (number and %)	Evaluation of Information Sources (number and %)	Referencing and Citation (number and %)	Research Ethics and Plagiarism (number and %)
Dissatisfied	5 (2.55)	6 (3.06)	4 (2.04)	7 (3.57)
Slightly Satisfied	12 (6.12)	11 (5.61)	10 (5.10)	9 (4.59)
Satisfied	45 (22.96)	42 (21.43)	50 (25.51)	46 (23.47)
Very Satisfied	85 (43.37)	78 (39.80)	75 (38.27)	77 (39.29)
Extremely Satisfied	49 (25.00)	59 (30.10)	57 (29.08)	57 (29.08)
Total (N = 196)	196 (100)	196 (100)	196 (100)	196 (100)

Notes: Likert Scale: 1 = Dissatisfied, 2 = Slightly satisfied, 3 = Satisfied, 4 =Very satisfied, 5 = Extremely satisfied (Multiple answer allowed) N = 196

This suggests that the comfort level with technology tools is not influenced by whether a student is an undergraduate or a postgraduate. Therefore, the null hypothesis, which states that the comfort level is independent of educational level, cannot be rejected. These findings imply that both undergraduates and postgraduates exhibit similar comfort levels when using technology tools for information retrieval. This insight can help inform educational strategies aimed at enhancing technological proficiency across different educational levels.

The descriptive analysis of the satisfaction levels for various aspects of information literacy instruction among 196 participants is summarized in the table. For "Searching for Information," most participants were very satisfied, with 85 (43.37 %) indicating this level, followed by 49 (25.00%) who were extremely satisfied. The lowest satisfaction level was dissatisfied, with only 5 (2.55 %) participants. In "Evaluation of Information Sources," 78 (39.80 %) participants were very satisfied, followed by 59 (30.10 %) who were extremely satisfied. The least satisfied group, those who were dissatisfied, comprised 6 (3.06 %) participants. Regarding "Referencing and Citation," 75 (38.27 %) participants were very satisfied, and 57 (29.08 %) were extremely satisfied. Dissatisfaction was reported by 4 (2.04 %) participants, making it the lowest satisfaction level in this category. For "Research Ethics and Plagiarism," 77 (39.29 %) participants were very satisfied, and 57 (29.08 %) were extremely satisfied. The lowest satisfaction level, dissatisfied, was reported by 7 (3.57 %) participants. Overall, the highest level of satisfaction was observed in "Searching for

Information" with 85 (43.37 %) participants being very satisfied, while the lowest level of satisfaction was in "Referencing and Citation," with 4 (2.04 %) participants reporting dissatisfaction. This distribution indicates a general trend of high satisfaction across all categories, with "Very Satisfied" and "Extremely Satisfied" being the most common responses.

Objective: To determine the correlation between satisfaction levels in different aspects of academic skills: searching for information, evaluating information sources, referencing and citation, and research ethics and plagiarism.

Null Hypothesis (H0): There is no correlation between the satisfaction levels in different aspects of academic skills.

V/s

Alternative Hypothesis (H1): There is a correlation between the satisfaction levels in different aspects of academic skills.

4. Results

Understanding the correlation between satisfaction levels across different academic skills can provide insights into how these skills are perceived by students. Identifying strong correlations can help educators design more integrated and comprehensive training programs. Pearson correlation coefficient is used to determine the strength and direction of the linear relationship between satisfaction levels in different aspects of academic skills.

Table 7. Correlation result

		Searching for Information	*Evaluation of Information Sources*	*Referencing and Citation*	*Research Ethics and Plagiarism*
Searching for Information	Pearson Correlation	1	0.85	0.78	0.80
	Sig. (2-tailed)		0.000	0.000	0.000
	N	196	196	196	196
Evaluation of Information Sources	Pearson Correlation	0.85	1	0.75	0.82
	Sig. (2-tailed)	0.000		0.000	0.000
	N	196	196	196	196
Referencing and Citation	Pearson Correlation	0.78	0.75	1	0.90
	Sig. (2-tailed)	0.000	0.000		0.000
	N	196	196	196	196
Research Ethics and Plagiarism	Pearson Correlation	0.80	0.82	0.90	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	196	196	196	196

P-values less than 0.05 typically indicate that the correlation is statistically significant. “Searching for Information” is strongly positively correlated with all other variables, with the highest correlation with “Evaluation of Information Sources” (0.85) and the lowest with “Referencing and Citation” (0.78). “Evaluation of Information Sources” shows a strong positive correlation with all other variables, with the highest correlation with “Research Ethics and Plagiarism” (0.82) and the lowest with “Referencing and Citation” (0.75). “Referencing and Citation” is also strongly correlated with all other variables, particularly with “Research Ethics and Plagiarism” (0.90). “Research Ethics and Plagiarism” has strong positive correlations with all other variables, especially with “Referencing and Citation” (0.90).

5. Conclusion

This study has provided insight into the level of information literacy abilities possessed by students at American University in the Emirates (AUE), Dubai located in the United Arab Emirates. By conducting a thorough examination of information literacy levels in different fields of study and academic stages, some significant discoveries have been made. Initially, the survey uncovers a substantial level of information literacy skills among undergraduate and graduate students at AUE, with significant discrepancies observed throughout other colleges and programs. This highlights the significance of focused treatments and customized information literacy programs to tackle requirements within each academic field. The research emphasizes the vital importance of formal instruction and training provided by librarians in improving the information literacy skills of students. The results indicate a direct relationship between obtaining structured teaching and increased levels of satisfaction with education in information literacy. This highlights the importance of ongoing investment in librarian-led training programs and workshops to further improve students' information literacy skills. In the futurizing is crucial to utilize these findings to guide the creation of successful information literacy initiatives and educational interventions at AUE. This encompasses the implementation of focused training programs, the integration of information literacy elements into current curriculum, and the promotion of cooperation among librarians, faculty members, and academic departments. Furthermore, continuous assessment and evaluation of information literacy programs are crucial to guarantee their efficacy and pertinence in addressing the changing needs of students and academic demands. This study is not only enhancing comprehension of information literacy skills among students at AUE, but also provides significant insights for improving information literacy instruction and practice in higher education institutions more generally. Institutions may enhance students' ability to negotiate the complexity of an information-rich society and flourish academically and professionally by prioritizing activities that promote information literacy and develop a culture of lifelong learning and critical inquiry. This study seeks to improve information literacy initiatives at AUE and provide insights for future methods to promote information literacy in higher education.

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Understanding Media and Information Literacy (MIL) in the Digital Age: *A Question of Democracy* by Ulla Carlsson

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Abstract

This review examines the book titled *Understanding Media and Information Literacy (MIL) in the Digital Age: A Question of Democracy*, edited by Ulla Carlsson, which underscores the pivotal role of media and information literacy (MIL) in fostering democratic engagement, social justice, and civic empowerment in a media-saturated era. Employing an interdisciplinary approach, this book synthesizes perspectives from education, political science, and media studies to explore the evolving role of MIL within digital transformations. The book's central idea aligns with UNESCO's 2030 Sustainable Development Goals, emphasizing MIL's potential to bridge digital divides, combat misinformation, and foster active citizenship across diverse multimedia landscapes. The review underscores the book's strengths, particularly its effective integration of MIL within democratic frameworks. It also identifies areas for further scholarly exploration, such as expanding empirical research and including perspectives beyond the Global North. Overall, Carlsson's work provides critical insights for academics, policymakers, and educators, emphasizing the importance of implementing MIL as a foundational component of democratic societies.

Keywords: Media and Information Literacy, digital democracy, social justice, civic engagement, disinformation, digital citizenship, UNESCO, global perspectives, media literacy education, democratic participation.

1. Introduction

Understanding Media and Information Literacy (MIL) in the Digital Age: A Question of Democracy, edited by Ulla Carlsson (Carlsson, 2019), is a comprehensive study of the increasing significance of MIL in a contemporary media-saturated world. Published by UNESCO, the book discusses the concept of MIL as a critical component of democratic engagement and provides insights into how media consumption, analysis, and production contribute to preserving democratic values in the age of digital transformation. The book emphasizes the MIL's potential to promote active citizenship while addressing digital divides and disinformation challenges. This review provides an analysis of the book's strengths, themes, and the opportunities it offers for further development.

2. Material and methods

Each three parts of the book deals with a particular aspect of MIL: Part 1 underscores the MIL conceptual framework, its evolution, and its role in advancing social justice and democracy; Part 2 addresses the Sweden's experience with MIL is examined as an essential tool for promoting democracy, serving as a compelling case study that underscores the practical implications of MIL initiatives in educational environments and everyday life. Meanwhile, Part 3 adopts a global

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perspective, considering MIL in the broader context of global social change and its significant relevance to the United Nations' 2030 Agenda for Sustainable Development (UNESCO, 2015). These Parts work together to emphasize the growing need for MIL to ensure citizens can critically engage with media, distinguish between credible and false information, and actively participate in democratic processes, regardless of geographical location, professional and educational background, national identities, and values.

Led by Carlsson, the book (Carlsson, 2019) contributors argue that MIL is more than just a technical skill; it is an essential component of active citizenship in the digital era that equips learners with skills such as critically assessing, producing, and sharing media content across various digital platforms. The book's well-organized structure facilitates a comprehensive exploration of MIL from a variety of perspectives, thereby underscoring its critical importance for the well-being of contemporary democratic societies; this methodologically rigorous approach not only renders the text accessible to academic audiences but also equips media education practitioners with invaluable, actionable insights that can be effectively implemented in their work.

3. Discussion and Results

The interdisciplinary approach is one of the key strengths of this book, which brings together scholars, policymakers, and practitioners from various fields, who are called upon to create practical tools aimed at enhancing media competence among individuals, including preparing citizens to combat disinformation in all its forms (Buckingham, 2003, 2015; Fedorov, 2018; Jolls, Johnsen, 2018; Masterman, 2013; Potter, 2022). This diversity of perspectives enhances the book's authority and ensures that the discussion of MIL is not limited to a purely academic context. It offers readers a comprehensive understanding of how MIL operates at the intersection of education, politics, and media, including case studies, practical examples, and theoretical discussions for effective function.

Of particular note is the book's chapters' emphasis on social justice. Part I is devoted to UNESCO's media and information literacy framework, emphasizing that media literacy (ML) is more than just media consumption (UNESCO, 2013). Contributors say it involves comprehensive skill sets, including media content access, evaluation, creation, and communication across various formats. In Carlsson (Carlsson, 2019) article *MIL in the Cause of Social Justice and Democratic Rule*, the author emphasizes that MIL is a matter of increasing people's media competence and a tool to combat inequality, disinformation, and exclusion. The author discusses how MIL can be used to address gender, socioeconomic, and racial issues, which is timely and relevant.

The author contends that freedom of expression and access to diverse, reliable information are essential for democratic governance, emphasizing that MIL should be incorporated into a comprehensive democracy strategy. This broad conceptualization of MIL, which aligns well with the current understanding of digital literacy in academic literature (Hobbs, 2018; Livingstone, 2018; Levitskaya, Fedorov, 2021), is one of the book's greatest strengths, validating its arguments and strengthening its credibility that MIL should be viewed as a *right*, not a *privilege*, for citizen engagement and democratic participation, particularly in pursuing equality, especially gender equality and social justice.

One of the central insights from this book is Carlsson's emphasis on a holistic approach to analyzing recognized manipulation techniques in her article *Understanding Media and Information Literacy (MIL) in the Digital Age*. Along with Levitskaya and Fedorov (Levitskaya, Fedorov 2021), the author believes that equipping learners with the ability to recognize manipulation techniques is essential to combating media manipulation and promoting informed, critical engagement with media in democratic contexts where the public needs access to accurate information for meaningful civic engagement (Carlsson, 2019).

Guy Berger's contribution, *Whither MIL: Thoughts for the Road Ahead*, advocates for expanding MIL to encompass digital literacy, regarding understanding how algorithms shape the received information since the traditional understanding of MIL is no longer sufficient. These insights are valuable as they highlight the importance of teaching individuals to assess the media content critically and understand the structures (e.g., algorithms) that influence the content they are exposed to. Berger's views align with Masterman's *Voices of Media Literacy* when the author emphasizes empowering individuals through critical thinking and fostering autonomous, critical engagement with media (Masterman, 2013).

As discussed in Part II, examining MIL within the Swedish context supports the book's central argument that MIL is essential for individuals trying to navigate the complexities of today's

media environment. This section illustrates how MIL fosters critical engagement with media and enhances democratic participation in social contexts. The authors explore how MIL equips citizens with skills to participate more actively in democratic processes by enabling them to critically assess the credibility of the information they encounter. In the article *Mapping Media and Information Literacy (MIL) in Sweden: Public Policies, Activities, and Stakeholders*, Martina Wagner discusses Sweden's strategy for integrating MIL into its educational and policy frameworks.

The country takes a proactive approach by incorporating MIL into school curricula and launching public awareness campaigns. This argument is consistent with contemporary research (Feijoo et al., 2021; Jolls, 2019; Gabdullina, 2024) that shows that media-literate people are more likely to engage in political life through digital platforms. Focusing on real-world examples, such as the digitalization of education in Sweden and the integration of MIL into the national curriculum, provides concrete evidence of how MIL can be effectively implemented. Including data from surveys provides a solid empirical basis for the claims made by the authors.

Another strength of the book is its recognition of the tension between free speech and the need to regulate harmful content. This discussion is particularly relevant, considering the ongoing debates about combating misinformation and hate speech in digital spaces while protecting freedom of expression. The contributors acknowledge the importance of media freedom but emphasize that MIL plays a crucial role in mitigating the harms associated with unregulated information flows. Jutta Haider and Olof Sundin's chapter, *How Do You Trust? On Infrastructural Meaning-Making and the Need for Self-reflection* emphasizes the importance of trust in our information-saturated world. Trust in the sources of information, the platforms that distribute it, and the underlying infrastructures of media distribution are essential for a critical understanding of and engagement with digital media. Their contribution is significant because it links MIL to the larger conversation about trust and credibility. This is especially relevant in an era marked by fake news and disinformation, which lead to political propaganda and misleading advertising and increase distrust in public institutions and media organizations (Levitskaya, Fedorov, 2020).

Novak's contribution, *Understanding Media and Information Literacy (MIL) in the Digital Age*, offers a forward-looking analysis of a national, coordinated effort to advance MIL within an evolving digital environment. The author emphasizes the need for a robust media literacy framework that empowers individuals to navigate content critically and responsibly in diverse and sometimes restrictive environments. While Nowak emphasizes structural and policy-driven frameworks, Jolls (Jolls, 2019) describes the inherent tension between media freedom and censorship, arguing that IR must engage with the complexities of content appropriateness. This multifaceted focus enriches the media literacy discourse by integrating Nowak's advocacy for coordinated policy approaches with Jolls's analysis of community-oriented issues that impact the effectiveness of media literacy in digital contexts.

In Part III, the authors acknowledge the need for MIL education to evolve with new media formats, including social media platforms, algorithms, and the complexities of big data. Grizzle and Hamada's contribution to *Media and Information Literacy Expansion (MILX) Reaching Global Citizens with MIL and Other Social Competencies* introduces the MIL Expansion (MILX) concept, which seeks to extend the traditional parameters of MIL by integrating essential social competencies such as digital literacy, intercultural communication, and civic engagement. The contributors state that in an increasingly globalized context, MIL must demonstrate adaptability and be seamlessly integrated into all educational frameworks to adequately prepare global citizens for the multifaceted challenges of the 21st century. The authors provide various examples illustrating MILX initiatives in different geographic settings, demonstrating how communities adapt and contextualize MIL to local needs. The authors present various examples illustrating MILX initiatives across diverse geographical settings, showcasing how communities adapt and contextualize MIL to local needs.

Potter (Potter, 2022) asserts that while core components of media literacy, like critical thinking, media analysis, and the ability to access, evaluate, and produce media content, are primarily consistent, differing emphases result in varying interpretations and practices. Broadening the definitional scope to encompass skills requisite for global citizenship renders it particularly salient for educators and policymakers operating within international contexts (Jenkins, 2016; Yelubayeva et al., 2023).

The strength of this section is its call for an expanded focus on digital citizenship. The authors argue that in the digital age, citizenship must extend beyond traditional political

engagement to include ethical participation in online communities. This argument resonates with contemporary discussions about digital citizenship (Buckingham, 2015; Hobbs, 2010; Mihailidis, 2018), emphasizing the importance of teaching individuals how to consume and evaluate information critically and contribute to the digital sphere responsibly and ethically (Jenkins, 2016; Joll, 2019; Yelubayeva, Mustafina, 2020).

The book excels in many areas, but there are opportunities for improvement. One critique is that while it emphasizes the critical need for MIL as a tool for democratic engagement, a more thorough integration of recent empirical studies could have further supported its claims. For instance, Mihailidis and Viotty's (Mihailidis and Viotty, 2017) research suggests that MIL education significantly fosters young people's critical thinking and civic engagement. Including such studies would have provided more substantial evidence for the book's arguments, helping readers understand how MIL can effectively achieve the democratic outcomes the authors advocate.

Another area for improvement in Part II is the depth of analysis concerning digital disinformation. Although the book discusses the challenges posed by fake news and propaganda, it could have drawn on empirical studies measuring the effectiveness of MIL in countering disinformation. Research by Guess et al. (Guess et al., 2019) and Fedorov (Fedorov, 2019) indicates that interventions to improve media literacy can significantly reduce susceptibility to false information. Incorporating these studies would have strengthened the book's argument that MIL is a viable solution to spreading disinformation. This would have provided readers with evidence-based insights into successful MIL interventions, enhancing the book's practical value.

Despite its comprehensive approach, the book heavily emphasizes the Global North, particularly Sweden. While the Swedish experience offers valuable lessons, the book could have further addressed the challenges of implementing MIL in different cultural and political contexts, especially in the Global South. Although the Swedish case is well-documented, including data from countries with varying levels of media literacy—such as those in Eastern Europe, Asia, or Sub-Saharan Africa—would have provided a more nuanced understanding of the challenges and opportunities associated with MIL. For instance, recent studies on the impact of MIL in post-authoritarian societies could illustrate how it serves as a tool for civic empowerment and social cohesion in fragile democracies. This gap is particularly noticeable in Part III, where a broader global perspective could have included more detailed discussions on how MIL can be adapted to meet the unique challenges faced by countries with limited technology and media resources.

4. Conclusion

"Understanding Media and Information Literacy (MIL) in the Digital Age: A Question of Democracy" thoroughly examines MIL's role in fostering critical thinking, social justice, and democratic participation. The contributors offer essential insights on how MIL can be incorporated into educational and policy frameworks, with a specific focus on the context of Sweden. The book has many strengths but would be improved by including a more global perspective and further empirical research. Overall, it serves as an essential resource for social scholars, policymakers, youth workers, activists, and other representatives of civil society who want to understand the transformative potential of MIL in the digital age.

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