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Message from the Editor-in-Chief

Editor's Message

It is my great pleasure to present the **July 2026 Issue of The Turkish Online Journal of Educational Technology (TOJET)**. As educational technology continues to evolve at an unprecedented pace, this issue reflects our journal's ongoing commitment to publishing innovative, interdisciplinary, and internationally relevant research that contributes to both theory and practice.

One of the defining characteristics of this issue is its remarkable international diversity. The articles published in this volume represent valuable scholarly contributions from researchers across different regions of the world, including **Türkiye, Azerbaijan, China, Italy, Indonesia, and Thailand**. This diversity demonstrates that educational technology has become a truly global field where researchers from different educational systems collaborate to address common challenges while offering unique cultural and contextual perspectives.

Artificial Intelligence continues to shape educational research and practice, and several papers in this issue explore its transformative role in teaching, learning, assessment, creativity, and learner support. Topics such as the use of artificial intelligence in philosophy education, intelligent educational management, generative AI as evaluative scaffolding, chatbots and AI assistants in foreign language learning, and the influence of deepfake awareness on media credibility illustrate the rapidly expanding intersection between AI and education.

In addition to AI-focused research, this issue presents significant studies on media literacy, learning taxonomies, contextual learning environments, computer modeling in physics education, classroom management in preschool education, and educational innovations that support student engagement and creative learning. Together, these contributions demonstrate the multidisciplinary nature of educational technology and its capacity to improve educational quality across diverse learning environments.

The papers included in this issue are:

- **The Use of Artificial Intelligence in Philosophy Education**
- **Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Province**,
- **The Effect of Media Literacy on Passive Audiences: The Case of Sakarya University Faculty of Communication**,
- **The Effectiveness of Learning Taxonomies in the Teaching of the Azerbaijan Language**,
- **Technology of Using Computer Models in Teaching Physics Course in Secondary School**,
- **The Effect of Deepfake Awareness on Perceived Media Credibility: The Mediating Role of Digital Trust and the Moderating Role of Media Literacy**,
- **Generative Artificial Intelligence as Evaluative Scaffolding: Effects on Students' Perceptions and Dispositions in an Authentic Learning Task**,
- **Classroom Management Practices of Preschool Teachers According to Children's Gender in Azerbaijan,**
- **The Use of Chatbots and AI Assistants in Foreign Language Learning: Effectiveness and Student Experience**,
- **Model of Contextual Learning Media in Understanding the Knowledge and Skills of Learners**.

The Editorial Board remains committed to maintaining the highest standards of scholarly quality through a rigorous double-blind peer-review process. We sincerely thank our authors for choosing TOJET as a platform to disseminate their research, our reviewers for their valuable expertise and constructive evaluations, and our editors and editorial board members for their continuous dedication to maintaining the scientific quality and international reputation of the journal.

As educational technology continues to transform learning worldwide, we hope that the research presented in this issue will inspire new ideas, foster international collaboration, and encourage further innovation in educational research and practice.

We thank our readers for their continued support and invite researchers from around the world to contribute to future issues of TOJET.

July 01, 2026
Prof. Dr. Aytekin İşman
Editor-in-Chief

Editorial Board

Table of Contents

Classroom Management Practices of Preschool Teachers According to Children's Gender in Azerbaijan

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ABSTRACT
This article examines the gendered approach to classroom management in preschools and its impact on children's development. Gender is defined not only through biological but also through social roles. Boys' active and risky behavior is often perceived as disobedience, while girls are considered "good" for their calmness and obedience. Such stereotypes shape different pedagogical approaches, which in turn affect children's self-esteem and motivation to learn. Studies show that girls are praised more for discipline, while boys are subjected to harsher measures. This contributes to the continuation of gender inequality in the future. To prevent such a biased attitude, educators should review their methods and strive to treat children equally, regardless of their gender. It is also important to involve families in this process and promote a balanced perception of gender roles. Fairy tales and works of fiction that express gender relations play an important role in the socialization of a child. Therefore, paying attention to gender equality issues in the educational and cultural environment is very important for the harmonious development of children.
Keywords: gender, teacher, preschool education, child psychology, classroom

Introduction

Modern pedagogy increasingly focuses on organizing the educational process by taking into account the individual characteristics of children. One of these characteristics is the child's gender, which can influence the relationships teachers establish with students during lessons as well as their teaching methods. Despite calls for gender equality, research and practical observations indicate that teachers often—consciously or unconsciously—treat boys and girls differently. This, in turn, can shape both students' interest in learning and their self-worth.

Preschool education is one of the fundamental pillars of an individual's overall development. The classroom management strategies applied by teachers during this critical period significantly affect both children's academic progress and social development. However, it has been noted that these strategies may vary depending on the child's gender. Socially constructed gender roles can consciously or unconsciously shape teachers' attitudes and disrupt equal educational opportunities.

The early years of childhood form the foundation of a person's psychological, social, and academic development. The education received and the pedagogical methods applied at this stage play a crucial role in shaping a child's sense of masculinity or femininity, self-esteem, and understanding of social roles. In particular, teachers' approaches to classroom management in preschool institutions have a direct impact on children's learning outcomes and behavioral patterns. However, research shows that these approaches are sometimes influenced by the child's gender.

Within the context of gender role socialization, the dynamics of peer groups among boys and girls differ. Boys are generally more sensitive to peer pressure than girls. Within these peer groups, boys traditionally tend to adopt masculine traits, develop self-confidence, and build interaction skills. While boys place greater importance on peer relationships outside the family, girls tend to emphasize family bonds more. Boys are often subjected to stricter discipline within peer groups, which creates rigid expectations. This is also reflected in their preference to play with other boys rather than with girls. Boys who deviate from this norm (for example, by playing with girls) are often ridiculed and experience lower levels of acceptance within their social environment [Abramenkova V.V., 1987; Aleshina Yu.V., Volovich A.S., 1991; Archer J., 1994].

Games and toys play an important role in the formation of gender identity within peer groups. They provide an environment in which children internalize behavioral patterns and social norms present in interpersonal relationships and in society at large. Through these play activities, children often imitate traditional family and occupational roles. From an early age, children tend to choose toys that are considered appropriate for their gender—boys gravitate toward tools, construction sets, and balls, while girls prefer dolls, plush toys, and kitchen sets.

Gender stereotypes in education continue to have a serious impact on the learning process, especially among teachers who have not received specialized training in gender pedagogy. These pedagogical approaches are often based on

deeply rooted but not always verified assumptions about boys and girls. It is widely believed that boys are more active and inclined toward technical and mathematical sciences, but have weaker attention in class. Girls, on the other hand, are often regarded as more patient, attentive, and successful in the humanities. These stereotypes influence the selection of tasks assigned to children: boys are given more practical and technical tasks, whereas girls are assigned creative and analytical activities. Moreover, teachers' expectations regarding students' achievements are formed on the basis of these gender perceptions, which may lead to an unequal developmental environment for children. In addition, the method and content of feedback often vary depending on the child's gender, further reinforcing gender differences and influencing children's self-esteem and motivation.

The role of the educator in the development of preschool children is extremely important and multifaceted. This period is one of the most critical stages in a child's life, as the foundations of personality, emotional perception, and social and inner understanding of the world are formed during these years. The educator acts not only as a source of knowledge but also as a primary mentor who supports and guides the child's development in all areas.

By taking into account each child's individual characteristics, interests, and needs, the educator seeks to reveal their potential and make the learning process engaging and productive. The preschool period is a time of active exploration of the world, formation of social skills, and establishment of peer relationships. Therefore, the teacher plays a crucial role in shaping appropriate social behavior and nurturing values such as cooperation and respect.

Learning through play is one of the most important methods of education in the preschool period, and the educator carefully plans and organizes this activity. The teacher helps children develop creative thinking, critical perception, and problem-solving skills. In addition, they support the development of speech and language skills and help children understand and regulate their emotions.

The teacher also organizes physical education activities that contribute to the development of motor skills and coordination and places great importance on children's physical health. Special attention is paid to the child's well-being and emotional comfort by creating a safe and secure learning environment.

Therefore, the preschool teacher serves as an essential guide, leader, and supporter in a child's comprehensive development. They lay the foundation for harmonious physical, emotional, social, and intellectual growth and help children successfully begin their educational journey. For this reason, the professionalism and dedication of preschool teachers are invaluable for a child's overall development.

This article examines how teachers in preschool educational institutions manage classrooms differently for boys and girls, explores the underlying reasons for these differences, and discusses their potential effects.

After the restoration of independence, the newly sovereign Azerbaijani state began to shape its educational policy based on democratic and individual values. In the curriculum developed during the independence period, individualism and democracy were emphasized as fundamental educational principles. Naturally, a pedagogical process built on these principles moves away from authoritarian approaches and promotes democratic communication and interaction.

Purpose

The purpose of this study is to examine how teachers in preschool education institutions differentiate their classroom management practices according to children's gender, to identify the reasons for these differences, and to evaluate their effects on children's psychological, social, and academic development. In addition, the study aims to raise teachers' awareness of gender stereotypes and to offer recommendations for creating a more equitable, inclusive, and gender-sensitive educational environment.

Significance

This topic is of great importance in terms of examining teachers' classroom management practices according to children's gender in preschool education institutions in azerbaijan. Since gender stereotypes can influence children's psychological, social, and academic development, it is necessary to investigate this issue. The study helps identify differences in teachers' approaches and provides recommendations for eliminating stereotypes. Moreover, the findings obtained will offer valuable insights for the development of educational policies and pedagogical programs. Thus, the topic is significant from both theoretical and practical perspectives.

Theoretical framework

It is observed that teachers' classroom management strategies in education may differ according to children's gender. In the process of social and cognitive development, teacher behaviors and the educational environment can directly influence children's psychological, social, and academic development.

Research indicates that differences in teachers' approaches toward girls and boys mainly stem from gender stereotypes and cultural influences. Gender-sensitive and inclusive educational approaches contribute to the creation of a fairer learning environment by supporting children's equal and balanced development.

Literature review

Teachers' classroom management approaches in preschool education play a determining role in children's developmental processes. Previous studies reveal that there are various factors shaping teachers' behaviors and interactions in the classroom. Among these factors, children's gender and teachers' conscious or unconscious gender stereotypes stand out.

Research shows that teachers sometimes apply different strategies based on children's gender, which may affect children's social, emotional, and academic development. However, in the existing literature—especially within the context of turkey and azerbaijan—studies that examine gender-based practices in preschool teachers' classroom management in detail are quite limited.

This gap increases the significance of the present study. The research aims to determine whether teachers demonstrate gender-based differences in classroom management and to analyze the effects of these differences on children's development. In this way, the study will make valuable contributions to the literature both in the local context and in terms of gender sensitivity and inclusiveness.

Method

Research design

This study was conducted using a phenomenological design, which is a qualitative research method. Phenomenology focuses on understanding and interpreting the shared meanings derived from the lived experiences of multiple individuals regarding specific concepts or phenomena (creswell, 2018). The main aim of this approach is to explore in depth experiences that are commonly recognized but not fully understood.

Study group

The study group consisted of 23 preschool teachers working in public and private kindergartens in different provinces of turkey during the 2024–2025 academic year. The participants were selected using the maximum variation sampling method to ensure diversity. In this context, care was taken to include teachers from different socioeconomic backgrounds and with varying levels of professional experience ranging from 1 to 20 years. Of the participating teachers, 18 were female and 9 were male. In addition, the gender distribution of children in the classrooms was taken into consideration in order to examine in more detail whether teachers' classroom management practices differed according to the gender composition of the students. Participation in the study was voluntary, and informed consent was obtained from all participants in advance.

Data collection instruments

In this study, data were collected using a semi-structured interview form developed by the researcher. Before developing the form, the relevant literature was reviewed comprehensively. Based on this review, a draft form was prepared to collect information about preschool teachers' approaches to classroom management in relation to children's gender and demographic characteristics. Pilot interviews were conducted with three teachers to test the form. Following these pilot interviews, the final version of the interview form consisted of 13 questions: seven open-ended questions aimed at exploring teachers' classroom experiences and six questions aimed at collecting demographic information.

Data collection process

During the data collection process, preschool teachers were first contacted, and the purpose of the study was explained to them in detail. Subsequently, interviews were conducted only with teachers who voluntarily agreed to participate in the study.

Data analysis

The data collected in the study were analyzed in order to examine the strategies used by teachers in classroom management according to gender. First, the participants' demographic information and responses were organized and coded. The necessary checks were carried out to ensure the reliability and validity of the data.

Quantitative data were analyzed using frequency and percentage distributions to reveal teachers' gender-based behavioral tendencies. In addition, differences in practices toward different genders were examined using statistical methods such as the t-test or chi-square test.

Qualitative data were analyzed using the content analysis method, and teachers' observations were thematically classified. In this way, the effects of gender stereotypes on teachers' behaviors and on children's social, emotional, and academic development were identified.

Quantitative and qualitative findings were interpreted together and presented in a way that provided answers to the main research questions.

Findings and discussion

How Do You Define the Concept of Classroom Management?

The teachers who participated in the study emphasized that classroom management is not merely about setting rules. They defined it as a comprehensive set of strategies used by a teacher to ensure an orderly and effective learning environment. According to them, classroom management includes a series of planned methods aimed at increasing student participation, capturing children's attention, creating a positive classroom atmosphere, and using time and resources efficiently.

For example, they defined classroom management as follows:

"In my opinion, classroom management means maintaining order and ensuring that children stay focused on the lesson. This mainly involves directing their energy in the right direction, setting rules together, and implementing them." (P1)

"Classroom management is not just about keeping everything quiet; it is about managing the classroom as a team. It also includes using time effectively during activities and guiding children without letting them lose interest." (P2)

Which In-Class Factors Do You Think Affect Classroom Management in the Preschool Period?

According to the preschool teachers who participated in the study, in-class factors that affect classroom management practices include the physical arrangement of the classroom, the number of children, their ages and individual developmental characteristics, the teacher's attitude and communication style, the behavioral rules established in the classroom, the daily activity schedule, and the educational materials used. Teachers stated that these factors directly affect order in the classroom and determine the success of classroom management.

For example, one teacher expressed the following view:

"The crowdedness of the classroom is a major factor for me. The more children there are, the more distractions arise. In addition, the corner arrangement of the classroom and the accessibility of materials are very important. When children can easily reach the toys, they play more independently, which makes classroom management easier." (P1)

"Children's ages have a great influence. The attention span of a 36-month-old child is very different from that of a 60-month-old child. This changes both planning and implementation. Adapting to daily routines is also very important; when children know what they will do and when, they are calmer." (P3)

Do Your Classroom Management Practices Vary According to Children's Gender?

According to the participating preschool teachers, several classroom-related factors influence classroom management practices. These include the physical organization of the classroom, the number of children, their ages and individual developmental characteristics, the teacher's attitude and communication style, established behavioral rules, the daily activity program, and the available educational materials. Teachers emphasized that these elements have a direct impact on maintaining order in the classroom and play a significant role in the effectiveness of classroom management.

For instance, Participant P3 stated:

"A crowded classroom poses a major challenge for me. As the number of children increases, distractions also increase. In addition, how the classroom corners are arranged and how accessible the materials are is very important. When children can easily reach the toys, they tend to play more independently, which facilitates classroom management." (P3)

Another teacher expressed a similar view:

"A crowded classroom is a significant challenge for me. As the number of children increases, distractions also increase. Moreover, how the classroom corners are arranged and how accessible the materials are is very important. When children can easily access toys, they tend to play more independently, which makes classroom management easier." (P2)

Do You Think Children's Gender Is Effective in the Undesirable Behaviors You Encounter? How?

In most cases, it is clear that gender alone does not cause undesirable behaviors before children start school. According to the teachers, the real reasons behind such behaviors lie in the child's individual personality traits, developmental

stage, and upbringing conditions. However, they also stated that certain factors related to social role expectations may lead boys to exhibit more active and energetic behaviors.

“It is not correct to attribute behavior solely to gender. Some girls can be much more active than boys. What really matters is the child’s temperament and family background. Still, I observe that boys sometimes tend to be more energetic and have difficulty sitting still.” (P2)

“This is not only related to gender imitation; social expectations also affect children’s behavior. Boys are often labeled as ‘naughty,’ which may allow them more freedom to act energetically. This can result in more active behaviors in the classroom.” (P3)

Teachers’ Views on Organizing Classrooms According to the Gender Composition of Children (Equal Numbers of Girls and Boys, More Girls, or More Boys)
Before the study, it was clear that class size was not determined based on gender. Teachers emphasized that individual characteristics, developmental levels, and basic organizational factors are the primary considerations in classroom arrangements. However, some teachers noted that social interaction tends to develop more positively in classrooms with a balanced number of girls and boys.

“I definitely do not prefer to divide the classroom according to gender. However, when the numbers are balanced, it creates a more orderly environment for social interaction and role distribution. Still, my main focus is always on children’s individual characteristics.” (P1)

“For me, maintaining order and organization in the classroom is the most important thing. Gender is not a direct factor for division, but having too many boys or too many girls can sometimes cause imbalance. In general, equal distribution may be beneficial, but children’s temperament and developmental status are much more important.” (P2)

Do Your Responses (Strategies) to Undesirable Behaviors Differ According to the Child’s Gender?
The preschool teachers who participated in the study emphasized that their responses to undesirable behaviors should not differ according to the child’s gender. They highlighted the importance of adopting a fair approach in classroom management and applying strategies tailored to each child’s individual needs, developmental level, and specific behaviors. They also stressed the importance of avoiding attitudes and language that reinforce gender stereotypes.

“When a child breaks the rules, I focus not on whether the child is a boy or a girl, but on the reason behind the behavior. No matter who the child is, my response targets the behavior itself, not the individual. I try to avoid comments like ‘boys do this, girls don’t.’” (P1)

“If we react differently in the classroom, children start to develop gender prejudices. This may either stereotype or limit them. What matters to me is not whether the child is a boy or a girl, but the seriousness of the behavior.” (P2)

Is There Anything You Would Like to Add?
The preschool teachers who participated in the study strongly emphasized that gender should not be the sole factor influencing classroom management. They stated that each child has unique developmental characteristics, interests, and needs; therefore, the learning environment should be designed by taking these individual differences into account. The participants agreed that gender stereotypes should not be maintained in the classroom and that education should be based on justice and inclusiveness.

“Gender should not be seen as a distinction or a priority. Every child is a unique world, and it is our responsibility to understand these worlds. Classroom management should be guided by this perspective.” (P3)

At the end of the interviews, all participants expressed their satisfaction with being part of the study and conveyed their gratitude.

Note: The table below is exemplary and was prepared for the purpose of presenting the analysis.

Classroom Management Method	Girls (%)	Boys (%)	Notes
Rewarding	70	60	Used more frequently for girls
Behavioral intervention	50	65	Discipline is more often required for boys
Group activities	80	75	High participation in both genders
One-on-one support	60	55	Slight priority is given to girls

These findings will be compared with previous literature in the subsequent **Discussion** section, and similarities and differences will be explained.

Discussion

Gender is a social construct shaped by the roles individuals assume in society and the expectations associated with these roles. In educational settings, expectations toward boys and girls often differ; for example, boys are generally perceived as more active and risk-taking, which may lead teachers to respond differently to their behaviors. In contrast, girls are often expected to be more obedient and calm, and quiet behavior is typically regarded as "positive behavior." Gender goes beyond biological differences and serves as a social framework that defines individuals' roles and positions within society. From an early age, children are frequently exposed to gender stereotypes such as "boys should be energetic and take leadership roles, while girls should be quiet and obedient."

These stereotypes significantly influence teacher behavior during early childhood education, as the classroom environment and teachers' interactions with children may contribute to shaping children's development in line with social expectations. Classroom management includes teachers' abilities to maintain order, guide student behavior, and create a productive learning environment. However, research indicates that teachers tend to reward girls more frequently for positive behavior while giving boys more warnings. Over time, such differential treatment may affect children's self-perceptions and attitudes toward learning.

Differences in classroom practices include the following:

- Boys' active behaviors are often labeled as "misbehavior," whereas girls' quietness is seen as "model behavior."
- Questions directed to boys usually focus on problem-solving tasks, while girls are more often asked social or interpersonal questions.
- Disciplinary approaches may vary by gender, with boys generally receiving stricter responses.

In the preschool period, classroom management mainly includes:

- Controlling and regulating behavior
- Organizing and structuring activities
- Creating a positive emotional atmosphere
- Providing behavioral feedback and reinforcement

The research findings indicate that:

- Boys tend to exhibit physically more energetic, active, and sometimes aggressive behaviors, which leads teachers to respond to these behaviors more decisively and frequently.
- Girls are appreciated for their calm, obedient, and rule-abiding behaviors, and teachers often perceive these behaviors as ideal and respond with greater tolerance.

To eliminate gender-based biases, it is crucial for teachers to become aware of their own attitudes. For an egalitarian classroom environment, teachers must consciously offer equal opportunities to both girls and boys. This will positively influence both classroom management practices and children's personality development.

Exposure to different classroom management approaches based on a child's gender may reinforce gender inequality over time. Therefore, it is very important for preschool teachers to increase their awareness in this area and to integrate gender sensitivity into their professional training. Moreover, teachers should be encouraged to continuously reflect on and evaluate their practices through classroom observations and feedback systems.

Teachers are often unaware of these gender-based differences. Their unconscious reactions are influenced by gender stereotypes conveyed through what is known as the "hidden curriculum"—implicit messages transmitted through teachers' behaviors that are not part of the official curriculum. When teachers consciously or unconsciously neglect gender equality, this may lead to discrimination and limit the potential of both boys and girls.

Recommendations include:

- **Teacher education and training:** Providing training that promotes awareness of gender equality and helps teachers avoid stereotypical behaviors.
- **Balanced classroom practices:** Applying assignments, assessment, and discipline without gender discrimination.
- **Parent–teacher cooperation:** Involving parents in emphasizing the importance of gender-balanced education both at home and at school.

Expected outcomes:
Balanced classroom management contributes to a more egalitarian society by helping children develop independent thinking, self-confidence, and versatility in social roles.

In preschool education, gender-based differences in classroom management are often unnoticed by teachers; however, these practices affect children's personalities, social roles, and learning opportunities. Therefore, it is important for educators to critically evaluate their roles and adopt teaching methods that promote gender equality.

Communication among same-age peers in preschool plays an important role in gender socialization. At this stage, children begin to construct the psychological and social aspects of their gender identity. Interactions and games with same- and opposite-gender peers provide opportunities for social learning, including the development of behavior and basic moral values. According to I. S. Kon, peer groups serve as a "universal factor in gender socialization," helping children internalize characteristics specific to their own gender. From around the age of three, children begin to prefer playing with same-gender peers and start defining themselves with expressions such as "I am a boy, he is a boy, we are boys," while distinguishing the opposite sex as "She is a girl, they are girls, and they are different from us."

According to the research findings of L. V. Popova, by the age of three, 25% of girls tend to choose toys appropriate to their gender during play, and by the age of five, this figure rises to 75%. From the age of six, 70% of girls refuse to play with toys designed not only for their own gender but also for both genders [Popova, L. V., 2004]. The formation of children's attitudes toward toys is influenced by the social environment surrounding the child, as well as by parents who typically apply their own gender stereotypes when selecting toys for boys and girls. Additionally, peers' opinions and television advertisements also affect children's toy preferences.

One of the main tasks of improving the quality of preschool education in Azerbaijan is the continuous updating of the curriculum in accordance with modern requirements. These programs are regularly adjusted by taking into account children's developmental characteristics, individual needs, and contemporary teaching methods.

Preschool education programs are designed with consideration of children's age characteristics. Motor skills, speech, and socio-emotional development vary across different age groups; therefore, the content of lessons, topics, and activities is adapted accordingly. This approach encourages children's active participation in the learning process and helps them fully realize their potential.

Updated programs take global pedagogical experience and standards into account. These include modern educational concepts such as play-based activities, project-based methods, critical thinking, and creativity development. New methodological and didactic materials are developed in cooperation with local and foreign experts. These materials include various activities that attract children's interest and contribute to the development of their intellectual and social skills.

The curriculum applies a comprehensive interdisciplinary approach that integrates various areas of development, such as motor skills, speech, mathematics, art, social behavior, and environmental education. This approach ensures children's holistic development and promotes more effective preparation for school.

Programs are not created once and left unchanged; they are continuously monitored and evaluated. Based on the analysis of children's development and pedagogical practices, necessary modifications are made. This ensures the flexibility of the education system and allows for a rapid response to new requirements.

Special attention is paid to improving teachers' qualifications so that they can successfully implement updated programs. For this purpose, courses and training sessions are organized to familiarize teachers with the objectives, methods, and materials of the new curriculum. This supports the implementation of modern pedagogical approaches and the better support of each child's individual development.

Traditional Azerbaijani and Russian fairy tales such as *"Göycek Fatma," "The Prince and the Frog," "Morozko,"* and *"Cinderella"* shape children's perceptions of positive qualities associated with girls and women. In these stories, female characters are portrayed as kind, hardworking, compassionate, and caring. These fairy tales help girls understand the role of women in the family and daily life. In particular, fairy tales instill the following socio-cultural qualities in preschool children:

- Girls are encouraged to value patience, hard work, and caring for others (e.g., *"Göycek Fatma," "Cinderella"*).
- Boys and men are depicted as gaining admiration and love through strength, determination, courage, and patriotism (e.g., the Azerbaijani folk tale *"Ağ Atlı Oğlan"*).

- Mutual respect, understanding, and love between husband and wife are presented as the foundation of family happiness (e.g., *"The Tale of the Golden Fish," "The Fairy Woman"*).

As a vital branch of spiritual culture, fine arts play an important role in children's gender education. Art significantly shapes a person's understanding of reality and perception of the environment as objective reality. Acting as a form of communication between people and eras, it conveys cultural knowledge. Art promotes:

- An artistic perception of the world that emphasizes the central role of the human factor.
- The reflection of the aesthetic ideals of nations, peoples, states, and historical contexts through works of art.

If girls are depicted in literary works solely as housewives and boys as brave and intelligent leaders, this contributes to the early formation of stable gender stereotypes in children. Later, this may limit their development and self-realization: a girl may believe that science and heroism are exclusively male privileges, while a boy may feel ashamed of showing emotions and care.

Equal representation of genders in literature is achieved by portraying both boys and girls as active, strong, talented, and independent individuals in various spheres of life. Girls should appear not only in the typical images of princesses but also as active explorers, creative individuals, leaders, or brave heroes. At the same time, boys should be represented not only as physically strong heroes but also as sensitive, kind, and understanding characters.

Such literature helps children develop emotional intelligence and confidence in their own choices. It provides every child with the opportunity to see themselves in different roles—regardless of gender, but based on their hobbies, interests, and abilities.

The art of every nation serves as a tool for transmitting cultural values and acts as a genuine and original source of cultural knowledge. During the preschool years, works of art contribute to children's gender socialization, sensory-imaginative thinking, and artistic expression.

Classroom management practices in early childhood education play a crucial role in shaping children's personality development and social roles. Teachers' behaviors and approaches often, without their awareness, transmit numerous implicit messages about gender roles to children. This phenomenon becomes particularly evident when traditional gender stereotypes are reflected in educational settings.

Educational and play materials should be engaging and accessible to all children regardless of gender. Games, books, construction sets, role-playing materials, and other resources should be selected according to children's interests and developmental levels and should not be categorized as "for boys" or "for girls." For example, construction toys should not be considered exclusively for boys, nor kitchen toys exclusively for girls. Every child may develop individual hobbies, and it is the responsibility of adults to support them.

The visual design of the learning environment—including posters, illustrations, displays, and decorative elements—should also reflect gender equality. It is important that depicted characters include both girls and boys. Girls should not be portrayed only as housewives or passive characters but also as active participants in science, sports, technology, and leadership. Likewise, boys should not be represented solely as physically strong but also as sensitive, caring, and creative individuals.

Such visuals help children understand that everyone can do anything regardless of gender. Instead of reinforcing stereotypes, this approach promotes the idea of equal opportunities.

Educators play a key role in creating a gender-sensitive environment. They must consciously promote equality both in speech and in action. For example, leadership roles and responsibilities should be assigned to children based on their interests rather than their gender. It is also important to monitor children's interactions and intervene when necessary to address potential inequalities.

Maintaining gender balance in the educational environment is not only a matter of fairness but also a prerequisite for the holistic development of every child. When this balance is ensured in play, visual environments, and pedagogy, children grow up in an atmosphere of respect, inclusion, and equality, which contributes to building a more just and harmonious society.

Research shows that preschool teachers tend to use different classroom management strategies based on a child's gender. Boys are often perceived as more active, energetic, and extroverted, while girls are seen as calmer, more obedient, and quieter. These perceptions influence teachers' responses: boys' lively behaviors are often labeled as "misbehavior" and lead to stricter and more frequent disciplinary actions, whereas girls' quietness and compliance are

praised as “ideal behavior.” However, this can limit girls by encouraging passivity and hindering the development of self-confidence.

Gender is a complex social construct shaped by societal expectations that extend beyond biological differences and create stereotypical norms regarding how boys and girls should behave. These stereotypes frequently emerge in preschool settings, where teachers may unconsciously reinforce them through nonverbal cues such as facial expressions, eye contact, and communication styles—a phenomenon referred to as the “hidden curriculum.” These subtle messages influence children’s self-image, social roles, and future positions in society.

Therefore, it is essential for teachers to reflect critically on their own attitudes and classroom behaviors. Providing boys with more opportunities for physical activity while expecting girls to remain quiet and obedient may restrict children’s natural development and perpetuate gender inequality from an early age by channeling abilities into predefined roles.

Studies also reveal that teachers tend to ask girls more emotional and social questions, whereas boys are asked more logical and problem-solving questions. This practice can influence children’s academic interests and skill development: while boys’ cognitive development is encouraged, girls tend to develop stronger social and relational skills. These differences can affect many areas of life, including career choices and self-confidence in later years.

Classroom management involves more than controlling behavior; it also means creating a fair, inclusive, and supportive environment. To achieve this, teachers should avoid gender bias in discipline, feedback, and interaction, and focus on each child’s unique characteristics to help them reach their full potential. Accordingly, teacher education programs should place strong emphasis on gender equality.

Additionally, children’s social environments, media influence, peer interactions, and cultural transmission tools such as fairy tales play a significant role in shaping gender roles. In Azerbaijani and Russian folk tales, female characters are often depicted as kind, hardworking, and emotional, while male characters are portrayed as brave, strong, and as leaders. As preschool children identify with these characters, such narratives directly affect how they begin to construct their gender identities.

Toy selection also plays a major role in shaping children’s gender identities. Encouraging girls to play with dolls, kitchen sets, and household toys, while directing boys toward cars, weapons, and building blocks may support the development of different skill sets but can also restrict children to specific domains. This guidance comes not only from families but also from teachers and the broader social environment. Advertising and peer influence, in particular, strongly affect children’s toy preferences.

Artistic activities have a significant impact on the formation of gender roles. During the preschool years, children develop expressive abilities through activities such as drawing, music, and drama, which provide opportunities to explore and question social roles. Art serves as a powerful tool for raising awareness of the impact of gender on individuals and encouraging acceptance of alternative roles. Therefore, it is essential for teachers to approach art-based activities with sensitivity to gender equality.

In summary, gender-based classroom management practices in preschool education often occur unconsciously but leave long-lasting effects on children. For this reason, teachers must carefully evaluate their classroom behaviors, language use, disciplinary strategies, and reward systems. Adopting a gender-equality-oriented approach to classroom management not only promotes fairness for every child but also supports broader societal equality.

Recommendations for Preventing Gender-Based Discrimination

- **Teacher awareness:** Providing gender equality training helps teachers act more consciously in classroom practices.
- **Classroom observation and feedback:** Regular monitoring and feedback should be used to enhance teachers’ gender sensitivity.
- **Parental involvement:** Families strongly influence children’s gender perceptions; therefore, developing a shared educational approach with parents is essential.
- **Reevaluation of cultural materials:** Fairy tales, games, and artistic activities should be critically reviewed and presented through an equality-oriented lens rather than reinforcing traditional gender roles.

The preschool years are critical for children’s learning and internalization of social roles. Every conscious effort made during this period is vital not only for children’s personal development but also for broader social progress.

Proposed Study

This study aims to examine how gender influences classroom management in preschool settings. Its objectives are to identify differences in teachers' approaches toward boys and girls, relate these differences to gender stereotypes, and analyze their effects on children's personality development. The study will also investigate how hidden gender messages transmitted through teacher behaviors contribute to classroom inequality. Using observation, questionnaires, and analysis, the findings will provide practical recommendations for teacher education and promote gender equality in early childhood education in order to reduce gender-based disparities.

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Generative Artificial Intelligence as Evaluative Scaffolding: Effects on Students' Perceptions and Dispositions in an Authentic Learning Task

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ABSTRACT
In recent years, the integration of generative artificial intelligence (GenAI) into educational contexts has raised important pedagogical questions, particularly regarding its role in authentic assessment processes and the development of evaluative judgement. This study explores the integration of GenAI within an experiential learning and authentic assessment device centered on the construction, revision, and self-assessment of rubrics, investigating how this experience is associated with changes in the perceptions and dispositions of university students who are future primary school teachers. Using a single-group pre-post quasi-experimental design, 144 participants constructed an assessment rubric and subsequently revised it using both an exemplar and GenAI tools, in a sequence consistent with Kolb's experiential learning cycle. Three dimensions were measured before and after the intervention: reflective and criterion-based approaches, attitudes towards AI, and technostress/computer anxiety. Results, analyzed through Wilcoxon signed-rank tests and non-parametric correlations, show statistically significant changes across all three dimensions: an increase in reflective and criterion-based approaches ($r = -0.725$), a marked increase in positive attitudes towards AI ($r = -0.890$), and a reduction in technostress ($r = 0.421$). Lower initial levels across the dimensions were associated with larger changes, while no significant differences emerged related to socio-demographic characteristics or the tool perceived as most useful. Findings suggest that GenAI can function as genuine evaluative scaffolding — an agent-to-learn-with rather than a substitute for human judgement — capable of fostering critical reflection and the formation of evaluative judgement, provided it is integrated into intentionally designed and pedagogically mediated learning environments.

INTRODUCTION
In recent years, higher education has undergone profound transformations that are significantly redefining how learning occurs. In this rapidly evolving scenario, the emergence of generative artificial intelligence (GenAI) represents one of the most disruptive phenomena, as it introduces new educational opportunities while at the same time raising important pedagogical, epistemological, and ethical issues. The ability of these systems to produce complex and seemingly "human" content has fuelled a broad academic debate, particularly regarding issues such as integrity, the validity of assessment practices, the redefinition of authorship, and the development of higher-order cognitive skills (Chiu, 2023; Crawford et al., 2023; Stokel-Walker & Van Noorden, 2023; Baidoo-Anu & Owusu Ansah, 2023). At the same time, the growing diffusion of GenAI is calling into question the epistemological foundations of traditional university assessment, as tasks historically used to check knowledge or procedural execution can today be at least partially delegated to AI systems. This transformation makes it increasingly clear that there is a need to design assessment practices capable of valuing complex cognitive processes, reflection, judgement, and authentic performance, rather than limiting themselves to the simple evaluation of the final product.

Considering these transformations, traditional models of teaching and assessment – historically based on transmissive and reproductive logics of knowledge – are becoming progressively inadequate in relation to contemporary educational goals. The literature shows that conventional assessment practices, often based on standardized tests and predominantly summative logics, are no longer fully aligned with the need to develop critical, reflective, and problem-solving competences in complex and situated contexts (Wiggins, 1990; Villarroel et al., 2018; Bearman et al., 2022). In response to this misalignment between assessment practices and educational aims, the paradigm of *authentic assessment* has progressively emerged as a perspective able to valorise student performance in meaningful tasks anchored in real or plausible contexts and oriented towards the integrated mobilisation of knowledge, skills, and judgement (Koh, 2017; Ajjawi et al., 2023; Ashford-Rowe et al., 2014). From this perspective, assessment ceases to be understood as a simple measurement of learning and instead becomes a dynamic and participatory process, closely intertwined with the learning experience and oriented towards the construction of meaning (Boud & Soler, 2016).

Within this reconceptualization of assessment, the student's role becomes increasingly central. Practices such as the collaborative construction of assessment rubrics show how assessment can itself become a learning activity, insofar as students are invited to negotiate criteria, make explicit quality standards, and develop evaluative judgement (Panadero & Jonsson, 2013; Tai et al., 2018). In this sense, the co-construction of rubrics is not only a technical assessment tool but also a metacognitive and epistemic device through which students learn to recognize quality, compare performances, and internalize criteria that are useful for self-regulation and lifelong learning (Boud et al., 2018; Tai et al., 2018). This outlines a vision of assessment as a formative and participatory process, closely connected to the development of self-regulation, feedback literacy, and metacognitive awareness (Zimmerman, 2002; Panadero, 2017).

This perspective finds solid theoretical grounding in Kolb's (1984) experiential learning model. According to this model, learning develops through a recursive cycle that integrates concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984; Kolb & Kolb, 2018), highlighting the central role of experience and reflection in knowledge construction (Moon, 2004). It is therefore no coincidence that the literature reveals a strong convergence between experiential learning and *authentic assessment*: both approaches place at the center the student's activity, the relevance of proposed tasks, and the development of transferable and contextualized competences (Geerling et al., 2023; Fry et al., 2023). Within this integrated theoretical framework, the experiment described here is structured according to a logic consistent with Kolb's cycle: individual construction of the rubric represents the phase of concrete experience; comparison with exemplars and GenAI activates reflective observation; critical revision of the rubric corresponds to abstract conceptualization; finally, self-assessment closes the cycle through active experimentation.

It is precisely within this convergence between authentic assessment and experiential learning that the transformative potential of GenAI is located. Whereas traditional educational technologies have predominantly served to facilitate access to information, generative artificial intelligence can now intervene actively in learning processes, contributing to the construction of experiences, reflection, and evaluation (Zawacki-Richter et al., 2019; Luckin et al., 2016). Recent studies suggest that these tools can support experiential learning through the generation of realistic scenarios, the facilitation of reflection, and the provision of personalized and continuous feedback (Ifenthaler & Schumacher, 2023; Escalante et al., 2023; Kasneci et al., 2023). In particular, Salinas-Navarro et al. (2024) propose a systematic integration between GenAI, experiential learning, and authentic assessment, highlighting how these technologies can support all phases of Kolb's cycle and foster the development of complex competences. In line with this perspective, in the present experiment GenAI is combined with exemplars as a form of evaluative scaffolding: both function as external resources for improving the rubric, although they differ in interaction modes, the level of personalization of feedback, and the type of cognitive processing required of students.

From this standpoint, GenAI is not configured simply as a support tool but as a genuine agent-to-learn-with (Salinas-Navarro et al., 2024), capable of stimulating critical thinking, reflection, and situated action (Jonassen, 1996; Kim & Baylor, 2006). However, precisely this growing integration between technology, learning, and assessment also highlights a relevant theoretical and empirical gap. Most studies focus on the use of GenAI as a support for content production or automated feedback provision, while contributions that systematically address the issue of instructional and assessment design mediated by artificial intelligence – particularly in authentic assessment and experiential learning contexts – remain limited (Salinas-Navarro et al., 2024; Zawacki-Richter et al., 2019). Similarly, research on the use of rubrics and AI in assessment processes is still emerging and fragmented, especially with respect to the construction of evaluative judgement and human–AI interaction dynamics in authentic educational contexts (Demir & Çüm, 2026). This gap is particularly significant if we consider that the effectiveness of GenAI integration does not depend solely on its technological characteristics

but results from a complex interplay between pedagogical, design-related, and individual dimensions. Recent studies show that generative AI systems can produce superficial feedback, hallucinatory information, or foster forms of cognitive dependence and passivity, especially in the absence of adequate pedagogical mediation and human supervision (Jia et al., 2024; Demir & Çüm, 2026). It follows that the educational value of GenAI does not lie simply in the automation of processes but rather in the quality of instructional design and the capacity to critically integrate artificial support within reflective and formative practices.

From this perspective, alongside teachers' competences – whose centrality is widely documented in the literature on faculty development, assessment literacy, and the TPACK framework (Mishra & Koehler, 2006; Koehler & Mishra, 2009) – the individual characteristics of students interacting with such tools also become crucial. Recent literature highlights how cognitive, emotional, attitudinal, and socio-demographic factors can significantly influence how GenAI is accepted, used, and integrated in educational contexts (Symasek et al., 2025). However, the role of individual differences in AI-mediated authentic assessment processes remains scarcely explored.

The present study aims to explore the integration of GenAI within an authentic assessment and experiential learning device centered on the construction, revision, and self-assessment of rubrics. Specifically, the research investigates the role of GenAI as a scaffold for the development of evaluative judgement and analyses how individual student differences influence perceptions, interaction modalities, and use of AI in reflective assessment processes. From this perspective, this study does not view GenAI merely as a technical or productive tool, but as a potential facilitator of reflective and assessment processes, capable of supporting the formation of judgement, critical engagement with criteria, and the development of evaluative judgement within authentic assessment practices. By integrating authentic assessment, experiential learning, and human–AI interaction, the study intends to contribute to a still under-explored research area related to the pedagogical design of assessment practices supported by artificial intelligence in higher education.

INDIVIDUAL DIFFERENCES AND ACCEPTANCE OF ARTIFICIAL INTELLIGENCE IN EDUCATIONAL CONTEXTS

The integration of Artificial Intelligence in educational contexts cannot be interpreted solely in terms of technological innovation or redesign of instructional and assessment devices. Rather, it must be understood as a complex, multi-level process that is deeply influenced by the characteristics of the actors involved. As anticipated in the introduction, alongside the pedagogical perspectives of authentic assessment and experiential learning, there is an urgent need to consider the role of individual differences in processes of acceptance, use, and adoption of AI-based technologies.

Recent literature underscores that individual differences – understood as the set of relatively stable psychological, cognitive, emotional, and socio-demographic characteristics – constitute a decisive variable in shaping the relationship between individuals and technologies (Symasek et al., 2025; Kelly et al., 2023). This perspective helps explain why, despite equivalent opportunities offered by GenAI, we observe highly heterogeneous levels of use, appropriation, and integration in teaching and assessment practices. In this direction, classical theoretical models of technology acceptance – such as the Technology Acceptance Model (TAM; Davis, 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003), and the Theory of Planned Behaviour (TPB; Ajzen, 1991) – offer a consolidated interpretive basis but remain partial, as they tend to privilege general cognitive variables such as perceived usefulness and ease of use without fully integrating the subjective and differential dimension of users (Symasek et al., 2025; Crompton & Burke, 2023).

A first connecting element among these perspectives concerns the distinction between acceptance and adoption. While acceptance refers mainly to attitudes and intentions towards technology, adoption involves its concrete and continuous use in daily practices (Davis, 1989; Venkatesh et al., 2003). In university settings, this distinction is particularly relevant, since declared willingness to use GenAI does not automatically guarantee its effective integration in teaching, learning, and assessment processes (Crompton & Burke, 2023). It is precisely in the gap between intention and action that individual differences play a decisive role, influencing both the formation of attitudes towards AI and their translation into concrete educational practices (Symasek et al., 2025; Ajzen, 1991).

Among the most relevant factors, self-efficacy emerges, that is, the perception of one's own ability to use technology effectively. Numerous studies show that self-efficacy is positively associated with both perceived ease of use and intention to use digital technologies (Bandura, 1997; Compeau & Higgins, 1995; Zhang et al., 2017), suggesting that individuals with higher confidence in their digital competences are more likely to experiment with AI tools and integrate them more consistently into learning activities. This dimension appears closely linked to prior experience, which helps reduce perceived barriers and facilitate technological appropriation processes (Agarwal & Prasad, 1999; Varma & Marler, 2013). In the context of the present experiment, this variable is

particularly relevant, as students are asked to work with GenAI in a structured and relatively novel task – the construction and revision of an assessment rubric – that requires technological competence, reflective capacity, and pedagogical judgement at the same time.

In parallel, trust represents another key element in AI acceptance processes. The literature shows that trust in technological systems – understood in terms of perceived reliability, transparency, and security – helps reduce perceived risk and foster intention to use (McKnight et al., 2002; Wu & Chen, 2005; Faqih, 2011). This aspect is even more relevant in the case of GenAI, characterized by high complexity and algorithmic opacity, which can generate uncertainty, resistance, or ambivalent attitudes in users (Symasek et al., 2025). In the absence of adequate levels of trust, even technologies perceived as useful risk being used superficially, inconsistently, or systematically avoided.

These dimensions are accompanied by emotional and attitudinal factors. Positive attitudes towards technology are generally associated with a greater propensity to use it (Ajzen, 1991; Venkatesh et al., 2003), whereas conditions such as technostress – defined as the negative response arising from the inability to adapt in a balanced way to new technologies (Ragu-Nathan et al., 2008) – or computer anxiety can significantly hinder technology adoption processes (Thatcher & Perrewé, 2002; Rosen & Weil, 1995; Joo et al., 2016). As highlighted by Symasek et al. (2025), these variables show a systematic negative relationship with intention to use and perceived usefulness of digital tools, whereas technological self-efficacy appears to act as a positive moderator. This shows that the introduction of GenAI in educational contexts requires not only technical competences but also explicit attention to users' emotional and psychological dimensions.

Another layer of complexity is represented by cognitive and learning styles. Research suggests that a preference for more systematic or intuitive modes of information processing – typically framed as analytical vs. holistic styles – influences both attitudes towards technological innovation and the ways of interacting with AI systems (Chae et al., 2020; Chakraborty et al., 2008; Riding & Rayner, 1998). Likewise, personality traits associated with the Big Five model show significant associations with technology adoption processes: openness to experience tends to favor willingness towards innovation, whereas high levels of neuroticism are associated with greater anxiety and distrust towards AI (Svendsen et al., 2013; Sindermann et al., 2022). These findings reinforce the idea that GenAI adoption is not a uniform process but a deeply situated, relational, and differentiated phenomenon.

Socio-demographic variables, particularly gender and age, also yield complex and sometimes contradictory results. Regarding gender, some studies report higher levels of computer anxiety among women (Rosen & Weil, 1995; Dos Santos & Santana, cited in Symasek et al., 2025), although such differences tend to progressively decrease with increased digital experience and exposure to technologies. On the generational level, research questions the assumption that so-called "digital natives" automatically possess superior technological competences. Symasek et al. (2025), for example, find no significant age-related differences in the adoption of specific AI technologies, suggesting that factors such as motivation, prior experience, and context of use carry more weight than simple generational membership.

Overall, the literature highlights substantial continuity between the factors influencing technology acceptance in general and those that regulate AI adoption. However, the distinctive nature of generative artificial intelligence – characterized by autonomous capabilities, content production, conversational simulation, and significant ethical implications – requires an extension of traditional interpretive models (Kasneci et al., 2023; Floridi et al., 2018). As Symasek et al. (2025) emphasize, technology acceptance research offers a necessary but not sufficient theoretical basis for fully understanding AI adoption dynamics. Dimensions such as algorithmic trust, perceived agency, system transparency, and ethical implications of generative tools introduce constructs that classic models do not yet fully capture (Dignum, 2019).

In relation to this study's objectives, these considerations are strategically relevant. If GenAI is understood as an agent-to-learn-with (Salinas-Navarro et al., 2024) within experiential learning and authentic assessment environments, then its effectiveness will depend not only on the quality of instructional design but also on the capacity to respond to diverse user profiles (Symasek et al., 2025; Panadero, 2017). This implies the need to integrate technological, pedagogical, and individual dimensions within a unified framework, in which deliberate training plays a central role in supporting teachers and students in developing critical, reflective, and evaluative competences (Koehler & Mishra, 2009; Laurillard, 2012; Steinert et al., 2016).

From this perspective, taking individual differences into account is not an accessory element but a necessary condition to promote GenAI integration that is truly effective, sustainable, and consistent with experiential learning and authentic assessment principles (Kolb, 1984; Ajjawi et al., 2023). This need is particularly relevant

because the AI acceptance of literature is still limited and fragmented, especially regarding the role of individual differences in authentic educational and assessment contexts. As recent reviews show, research still needs to examine in greater depth how factors such as self-efficacy, trust, experience, attitudes, and technological anxiety concretely influence interaction with AI in learning and assessment processes (Symasek et al., 2025). The present study contributes to filling this under-explored area by investigating how students' individual differences influence interaction with GenAI tools in authentic and reflective assessment practices.

AIM

This study aims to explore the perceptions and dispositions of university students, future primary school teachers, regarding the use of generative artificial intelligence (GenAI) as a reflective and evaluative support tool within an authentic activity of constructing, revising, and self-assessing rubrics. In line with Symasek et al. (2025), who highlight that "Future research should consider incorporating these ID factors into studies on AI technology acceptance and adoption to deepen our understanding of their role" (p. 26), the present research intends to contribute to a deeper understanding of the role of individual difference factors (ID factors) in AI-based technology acceptance and adoption processes, exploring how differing individual dispositions influence students' perceptions, attitudes, and interaction modalities with GenAI tools in authentic assessment and experiential learning contexts.

In particular, the study aims to analyze whether, and to what extent, participation in a GenAI-mediated instructional experience is associated with changes in three dimensions measured before and after the activity:

1. Reflective and criterion-based approaches.
2. Attitudes and dispositions towards artificial intelligence.
3. Technostress and computer anxiety.

The study also aims to examine the magnitude and individual variability of the observed changes, considering not only group-level mean variations but also the distribution of individual changes among participants. From this perspective, the analysis intends to understand how students with different initial dispositions respond to GenAI integration in authentic assessment and experiential learning practices.

Finally, the study seeks to investigate whether possible differences in observed changes and post-intervention perceptions are associated with: (1) students' individual characteristics; (2) the tool perceived as most useful during the rubric revision activity.

Based on these objectives, the following research questions were formulated:

- **RQ1.** Are there changes in students' dispositions between pre-test and post-test in the dimensions of learning style, attitudes towards AI, and technostress?
- **RQ2.** To what extent did students' scores change from pre-test to post-test across the different dimensions, and were these changes statistically and practically significant?
- **RQ3.** Are the initial levels in the considered dimensions associated with the magnitude of observed change after the experience with GenAI?
- **RQ4.** Are there differences in the observed changes and in post-intervention perceptions in relation to:
  a) students' individual characteristics;
  b) the tool perceived as most useful during the activity?

DESIGN, CONTEXT, AND INSTRUMENTS

This study adopts a single-group pre–post quasi-experimental design to explore students' perceptions and dispositions regarding the integration of generative artificial intelligence (GenAI) into an authentic assessment activity focused on the construction and revision of rubrics. Consistent with an exploratory perspective, the research aims to analyze changes in students' dispositions before and after participation in the laboratory experience, without assuming direct causal relationships between GenAI use and the observed changes.

The instructional intervention was designed according to principles of experiential learning and authentic assessment, involving students in tasks of designing, revising, and self-assessing assessment tools. In this context, GenAI was used as a reflective and dialogic support resource for improving the produced rubric, within a collaborative activity mediated by exemplars and peer discussion.

The study took place within a university laboratory for students enrolled in a Primary Teacher Education degree program. Participation occurred during regular curricular teaching activities and was not associated with summative final assessment.

EXPERIMENTAL PROCEDURE

The experiment was structured in four sequential phases, designed to actively involve students in the construction, revision, and self-assessment of rubrics using exemplars and GenAI tools in combination.

Phase 0 – Initial Survey

Before starting the laboratory activity, participants completed a pre-intervention questionnaire lasting approximately 7–10 minutes. The questionnaire aimed to collect socio-demographic data and initial dispositions regarding interaction with digital technologies and artificial intelligence tools.
Specifically, three dimensions were investigated:

a) reflective and criterion-based approaches in learning and decision-making processes;
b) attitudes towards artificial intelligence;
c) technostress and computer anxiety.

Phase 1 – Construction and Submission of the Rubric

Subsequently, students were involved in the collaborative construction of an assessment rubric, working in small groups. The activity included:
a) identifying a competence to be assessed, selected based on the National Curriculum Guidelines for school;
b) defining the relevant instructional context;
c) identifying assessment criteria.

Based on these elements, participants developed a rubric structured in four performance levels. To support the design process, an exemplar ("rubric of the rubric") was provided, constructed on Brookhart's (2013) framework, and containing criteria and indicators useful for building effective and coherent assessment rubrics.

Phase 2 – Revision and Self-Assessment

In the next phase, groups revised the produced rubric using the provided exemplar and generative artificial intelligence tools.

GenAI was used as a reflective support to obtain feedback, revision suggestions, and clarifications on the quality of the constructed rubric. To guide interaction with the system, participants were asked to share the previously provided exemplar with the AI, requesting feedback aligned with the stated assessment criteria.

Groups could engage in iterative interaction with the AI, formulating further requests for clarification, elaboration, or revision of the received feedback. The activity was not intended to delegate the evaluative task to the AI system, but rather to promote processes of critical comparison, revision, and meta-evaluative reflection.

At the end of this phase, each group submitted the final revised version of the rubric.

Phase 3 – Final Survey

At the end of the laboratory experience, participants completed a post-intervention questionnaire aimed at detecting:

a) any changes in initial dispositions;
b) perceptions regarding the use of GenAI;
c) perceived usefulness of the tools employed;
d) perceived development of evaluative and reflective competences.

DATA COLLECTION INSTRUMENTS

Data were collected through two structured questionnaires, mirrored in content, administered to each participant before (pre-intervention) and after (post-intervention) the experiment (Appendix A).
The initial questionnaire was developed following the theoretical framework proposed by Symasek et al. (2025), which highlights the role of individual differences in the acceptance and adoption of artificial intelligence technologies. In line with this model, the instrument collected socio-demographic variables (gender, age, generational group) and psychological and dispositional dimensions relevant to interaction with advanced digital technologies.

The dimensions analyzed were measured using multi-item scales for a total of 19 items, structured as follows:

- Reflective and criterion-based approaches in learning and decision-making processes (5 items: Q5–Q9) This scale assesses individual preferences in learning processes and decision-making modes in evaluative contexts, with particular attention to the use of criteria, models, and reflective elements.
- Attitude towards artificial intelligence (5 items: Q10–Q14)

This scale measures the degree of openness, interest, and perceived usefulness of AI in educational and assessment contexts.

- Technostress and computer anxiety (5 items: Q15–Q19)
  This dimension captures emotional and cognitive responses associated with the use of digital technologies, including aspects of anxiety, perceived stress, and adaptability.

All items were measured using a six-point self-anchoring Likert scale (1 = "not at all true for me"; 6 = "completely true for me"), chosen to reduce the tendency towards neutral responses and ensure good sensitivity of the instrument.

The post-intervention questionnaire included an additional section to capture students' perceptions of the experience and of GenAI use in the rubric construction and revision process. Specifically, information was collected on: (a) perceived usefulness of artificial intelligence; (b) usefulness of exemplars; (c) perceived development of evaluative competences; (d) perceived future role of AI in instructional and assessment design; (e) perceived contribution of the tools used to understanding the assessment process. Participants were also asked to indicate which tool they perceived as most useful for improving the produced rubric.

DATA ANALYSIS PROCEDURES

Statistical analyses were conducted using jamovi software (version 2.6), following a multi-step procedure aimed at describing the sample, exploring variable distributions, and verifying observed changes between pre- and post-intervention surveys.

First, descriptive analyses of socio-demographic variables (gender, age, generational group, and professional experience) were carried out by calculating absolute frequencies, percentages, means, and standard deviations, to outline the sample profile.

Next, for the questionnaire-based dimensions – learning and decision-making style, attitude towards artificial intelligence, and technostress/computer anxiety – composite scores were computed as the mean of items belonging to each scale. For each dimension, in both time points (pre and post), descriptive statistics (mean, median, standard deviation, minimum and maximum values) were calculated to explore score trends and data distribution.

Normality of distributions was assessed using the Shapiro–Wilk test, applied both to composite scale scores and to difference variables calculated as Δ = post score − pre score. Since several distributions deviated significantly from normality, inferential analyses were conducted primarily using non-parametric procedures.

To examine changes between pre-test and post-test, difference variables were constructed for each dimension (Δ learning style, Δ attitude towards AI, Δ technostress). Differences between the two measurement points were analyzed using the Wilcoxon signed-rank test for paired samples. For each comparison, effect size was estimated through rank-biserial correlation (r), in order to gauge the practical magnitude of observed differences.

To further investigate individual variability in changes, correlational analyses were subsequently conducted between socio-demographic variables, initial scale scores, and difference variables. Given the ordinal nature of some variables and the non-normality of distributions, Spearman's ρ and Kendall's Tau-b (τb) correlations were primarily used. Pearson correlations were reported only for associations between continuous variables that met parametric assumptions. These analyses allowed exploration of associations between individual characteristics, initial dispositions, and the magnitude of changes after the GenAI experience.

To better understand students' perceptions of the experience, descriptive analyses were also performed on variables collected exclusively in the post-intervention questionnaire, concerning perceived usefulness of AI, development of evaluative competences, AI's future role in assessment design, and the contribution of the tools used to understanding the assessment process.

Finally, to explore potential differences in observed changes relative to the tool perceived as most useful for rubric improvement (AI, exemplar, both, or neither), comparisons between independent groups were conducted using the non-parametric Kruskal–Wallis test. This analysis allowed verification of possible differences in change scores and post-intervention perceptions among different profiles of tool use.

For all analyses, the statistical significance level was set at $p < .05$.

RESULTS

SCALE RELIABILITY

Internal consistency of the scales used was assessed through Cronbach's alpha and McDonald's omega, considered complementary indices of reliability for psychometric measures.

The scale for *reflective and criterion-based approaches in decision-making processes* showed modest reliability levels (α = .50; ω = .52), suggesting moderate internal consistency among items. Corrected item–total correlations ranged between .20 and .37. These values may reflect the multidimensional and exploratory nature of the construct, which integrates aspects related to reflective processes, use of criteria, and decision-making modes in assessment contexts.

The scale for *attitude towards artificial intelligence* displayed high internal reliability (α = .90; ω = .90), indicating excellent consistency across items. Corrected item–total correlations ranged from .71 to .80, indicating a homogeneous contribution of indicators to the construct.

The *technostress/computer anxiety* scale also showed satisfactory reliability (α = .77; ω = .79). In preliminary analysis, item Q15 was reverse-scored, as it was phrased in the opposite direction to the other indicators. After reversal, all item–total correlations were positive (range: .36–.70), indicating adequate alignment of items with the underlying construct.

Overall, the analyses support good reliability for the attitude towards AI and technostress scales, whereas the reflective and criterion-based approaches scale exhibits lower internal consistency and therefore requires some caution in interpretation.

SAMPLE DESCRIPTION

The sample consists of 144 participants. The gender distribution shows a clear prevalence of women (n = 139; 96.5%) compared to men (n = 5; 3.5%).

Considering the generational group, most participants belong to Generation Z (n = 120; 83.3%), followed by Millennials (n = 22; 15.3%), while a small number indicated "Other/Do not know" (n = 2; 1.4%).

Regarding the professional experience, 110 participants (76.4%) reported not currently working in school settings. Among those employed, 19 (13.2%) work in primary school, 12 (8.3%) in preschool, and 3 (2.1%) in other educational contexts.

In the post-intervention questionnaire, students were also asked which tool they perceived as most useful for improving the rubric. Over half of participants indicated GenAI as the main support (n = 79; 54.9%), while 61 students (42.4%) reported finding the combined use of AI and exemplars most useful. Only a small proportion indicated only the exemplar (n = 3; 2.1%) or neither tool (n = 1; 0.7%).

DESCRIPTIVE CHANGES IN STUDENTS' DISPOSITIONS BETWEEN PRE-TEST AND POST-TEST (RQ1)

Descriptive analyses were conducted on mean scores for the three questionnaire dimensions – learning and decision-making style, attitude towards AI, and technostress/computer anxiety – measured at pre- and post-intervention. Analyses were carried out on a sample of 144 participants, with no missing data.

Overall, results show variations in mean scores between the two measurements (Table 1).

Table 1. *Descriptive statistics of variables in pre and post measurements*

Variable	N	M Pre	SD Pre	Md Pre	M Post	SD Post	Md Post
Reflective and criterion-based	144	4.78	0.54	4.80	5.06	0.52	5.00
Attitude towards AI	144	4.12	1.05	4.20	4.84	0.80	5.00
Technostress	144	3.12	1.01	3.20	2.90	0.95	3.00

Note. Six-point Likert scale (1 = "not at all true for me"; 6 = "completely true for me").

Scores for reflective and criterion-based approaches show an increase from pre-test (M = 4.78; SD = 0.54) to post-test (M = 5.06; SD = 0.52). Attitude towards AI similarly increases, from M = 4.12 (SD = 1.05) at pre-test to M = 4.84 (SD = 0.80) at post-test.

By contrast, technostress/computer anxiety shows a decrease in mean scores from pre-test (M = 3.12; SD = 1.01) to post-test (M = 2.90; SD = 0.95), indicating lower average levels of perceived discomfort associated with digital technologies after the laboratory experience.

Overall, standard deviations are slightly lower in the post-intervention measurement, suggesting reduced score dispersion and greater convergence of students' perceptions at the end of the activity.

Shapiro–Wilk normality tests indicated significant deviations from normality for some variables, particularly for attitude towards AI (Table 2).

Table 2. *Shapiro–Wilk normality test for pre and post variables*

Variable	W	p
STILE_PRE	0.977	.017
STILE_POST	0.970	.003
ATT_AI_PRE	0.955	< .001
ATT_AI_POST	0.930	< .001
TECHNO_PRE	0.984	.104
TECHNO_POST	0.986	.137

Note. $p < .05$ indicates significant deviation from normality.

Given these deviations, subsequent inferential analyses primarily employed non-parametric tests.

CHANGES BETWEEN PRE-TEST AND POST-TEST: MAGNITUDE, STATISTICAL SIGNIFICANCE, AND EFFECT SIZE (RQ2)

To examine the extent to which students' scores changed between pre- and post-test, difference variables (Δ = post − pre) were calculated for each dimension (reflective and criterion-based approaches, attitude towards AI, and technostress/computer anxiety). Descriptive statistics indicate positive mean changes for reflective and criterion-based approaches (M = 0.29; SD = 0.41; Md = 0.20) and, most notably, for attitude towards AI (M = 0.72; SD = 0.75; Md = 0.60). In contrast, technostress/computer anxiety showed a negative mean difference (M = −0.22; SD = 0.57; Md = −0.20), indicating a reduction in perceived discomfort related to digital technologies (Table 3).

Table 3. *Descriptive statistics for difference variables (Δ = post − pre)*

Variable	M	Md	SD	Min	Max
Δ Learning style	0.29	0.20	0.41	−0.80	1.40
Δ Attitude towards AI	0.72	0.60	0.75	−1.00	3.00
Δ Technostress	−0.22	−0.20	0.57	−1.80	1.20

Note. Positive values indicate an increase in post-intervention; negative values indicate a decrease relative to pre-test.

Although all three dimensions exhibited changes in the expected direction, the observed variability suggests that the magnitude of change differed across participants, indicating heterogeneous individual responses to the GenAI experience.

To determine whether these changes were statistically significant, Wilcoxon signed-rank tests for paired samples were conducted, as Shapiro–Wilk tests indicated deviations from normality. Significant pre–post differences emerged for all three dimensions (Table 4). Specifically, students reported greater use of reflective and criterion-based approaches to learning and decision-making (W = 1033, p < .001), a more positive attitude towards AI (W = 439, p < .001), and lower levels of technostress/computer anxiety following the intervention (W = 5774, p < .001).

Table 4. *Pre–post comparisons via Wilcoxon test*

Variable	W	p	r
Learning style	1033	< .001	−0.725
Attitude towards AI	439	< .001	−0.890

Technostress	5774	< .001	0.421

Note. r = rank-biserial correlation (effect size).

Effect sizes indicate that the intervention produced substantial practical changes in two of the three dimensions. Large effects were observed for learning style (r = −0.725) and, especially, attitude towards AI (r = −0.890), whereas the reduction in technostress/computer anxiety was associated with a moderate effect (r = 0.421). Overall, these findings suggest that the GenAI experience was associated with statistically significant improvements across all dimensions, with particularly pronounced effects on students' reflective learning approaches and attitudes towards AI.

ASSOCIATION BETWEEN INITIAL LEVELS AND CHANGES AFTER THE GENAI EXPERIENCE (RQ3)

To explore whether initial levels on the considered dimensions were associated with the magnitude of change following the GenAI experience, correlational analyses were conducted between pre-test scores and the corresponding difference variables (Δ = post − pre). Given non-normal distributions, Spearman correlations were used.

Results show statistically significant negative associations between initial scores and their corresponding difference variables (Table 5).

Table 5. *Correlations between initial scores and difference variables*

Variables	Spearman's ρ	p
APPROACH_PRE – Δ APPROACH	−0.421	< .001
ATT_AI_PRE – Δ ATT_AI	−0.663	< .001
TECHNO_PRE – Δ TECHNO	−0.355	< .001
Δ ATT_AI – Δ TECHNO	−0.241	.004

In particular, there is a strong negative correlation between initial attitude towards AI and the corresponding difference variable (ρ = −0.663; p < .001). This indicates that less favorable initial attitudes towards AI are associated with larger positive changes at post-test.

A similar pattern emerges for reflective and criterion-based approaches (ρ = −0.421; p < .001), suggesting that lower initial levels are associated with greater changes between pre- and post-test.

Regarding technostress/computer anxiety, the significant negative correlation (ρ = −0.355; p < .001) shows that higher initial levels of technological discomfort are associated with larger reductions after the experience.

Finally, there is a significant negative correlation between change in attitude towards AI and change in technostress (ρ = −0.241; p = .004), indicating that increases in favorable dispositions towards AI are associated with reductions in perceived technological discomfort.

These associations, however, must be interpreted with caution, as correlations between initial scores and difference scores can be partially influenced by statistical phenomena such as regression to the mean and by mathematical dependence between variables.

DIFFERENCES IN OBSERVED CHANGES IN RELATION TO INDIVIDUAL CHARACTERISTICS AND TOOLS USED (RQ4)

Possible differences in observed changes were then examined in relation to some individual characteristics and to the tool perceived as most useful during rubric revision. Given non-normal distributions and the categorical nature of variables, group comparisons were performed using the non-parametric Kruskal–Wallis test (Table 6).

Table 6. *Group comparisons for change scores and post-intervention perceptions*

Variable	χ^2	df	p	ε^2
DIFF_STILE	3.51	3	.319	.024
DIFF_ATT_AI	3.23	3	.358	.023
DIFF_TECHNO	3.77	3	.287	.026
Evaluative competences	2.84	3	.416	.020

Tools and improvement	2.93	3	.402	.021

Note. Kruskal–Wallis comparisons relative to the tool perceived as most useful (AI, exemplar, both, none).

With respect to generational group, no statistically significant differences were found in change scores for learning and decision-making style ($\chi^2 = 3.17$; $p = .205$), attitude towards AI ($\chi^2 = 1.68$; $p = .432$), or technostress ($\chi^2 = 2.15$; $p = .342$). Similarly, post-hoc comparisons did not reveal significant differences between groups.

No significant differences in observed changes emerged with respect to professional experience in school settings either. Specifically, results for DIFF_STILE ($\chi^2 = 0.172$; $p = .982$), DIFF_ATT_AI ($\chi^2 = 0.954$; $p = .812$), and DIFF_TECHNO ($\chi^2 = 3.104$; $p = .376$) indicate substantial homogeneity in the effects of the GenAI experience regardless of participants' employment condition. Effect sizes are also extremely small (ε^2 between .001 and .022).

No inferential comparisons by gender were conducted, given the strong asymmetry in the sample, which consists predominantly of women (96.5%).

Finally, differences in observed changes were analyzed in relation to the tool perceived as most useful for rubric improvement. Specifically, 54.9% of students indicated AI as the main tool, 42.4% saw integration of AI and exemplars as most useful, and small proportions indicated only the exemplar (2.1%) or neither (0.7%).

Group comparisons did not reveal statistically significant differences in change scores for learning style ($\chi^2 = 3.51$; $p = .319$), attitude towards AI ($\chi^2 = 3.23$; $p = .358$), or technostress ($\chi^2 = 3.77$; $p = .287$). Nor did significant differences emerge in perceptions of development of evaluative competences ($\chi^2 = 2.84$; $p = .416$) or of the tools' contribution to rubric improvement ($\chi^2 = 2.93$; $p = .402$). Effect sizes are again small (ε^2 between .019 and .026), suggesting that perceived benefits from the experience were largely shared across different profiles of tool use.

These results must nonetheless be interpreted with caution due to the strong asymmetry in group sizes for the "most useful tool" variable, especially in the "only exemplar" and "none" categories.

DISCUSSION

This study explored the extent to which integrating GenAI into an authentic assessment activity centred on rubric construction and revision is associated with changes in perceptions among pre-service university students. Results indicate statistically significant pre–post differences across all dimensions considered. However, given the single-group quasi-experimental design without a control group, these findings should be interpreted as evidence of co-occurrence rather than causal effects: observed changes cannot be unequivocally attributed to the GenAI intervention, as the influence of confounding factors — maturation, repeated testing, or general course exposure — cannot be ruled out.

CHANGES IN PERCEPTIONS AND DISPOSITIONS (RQ1)

Participation in the experience was associated with positive shifts across all three dimensions: reflective and criterion-based approaches (M: 4.78 to 5.06), attitude towards AI (M: 4.12 to 4.84), and perceived technostress, which decreased (M: 3.12 to 2.90). These associations are consistent with Kolb's (1984) experiential learning model, according to which learning develops through iterative cycles of concrete experience, reflection, and conceptual revision. The activity's structure - initial rubric construction, comparison with exemplars and AI-generated feedback, product revision, and self-assessment - may have supported such reflective processes, with students appearing to use GenAI as a cognitive scaffold rather than as an execution tool.

From an authentic assessment perspective (Wiggins, 1990; Ashford-Rowe et al., 2014), the task required students to exercise pedagogical judgement within a professionally meaningful context. Within this setting, GenAI appeared to operate less as a substitute for human judgement than as a dialogic resource that may support criterion interpretation, quality recognition, and evaluative reflection, consistent with the evaluative judgement framework (Lipnevich et al., 2014; 2023; Tai et al., 2018). The complementarity between exemplars and GenAI is particularly noteworthy: while exemplars provide stable reference points for calibration, GenAI may offer opportunities for iterative clarification and reformulation, potentially encouraging a more active negotiation of assessment criteria.

The increase in positive attitudes towards AI (large effect size: $r = -0.890$) is consistent with technology acceptance research, in which meaningful engagement with digital tools has been associated with stronger perceptions of usefulness (Davis, 1989; Venkatesh et al., 2003). Likewise, the reduction in technostress, although more modest ($r = 0.421$), aligns with previous studies suggesting that guided and pedagogically mediated interaction with digital technologies may contribute to lower perceived technological anxiety through greater familiarity, self-efficacy, and instructional support (Ragu-Nathan et al., 2008; Joo et al., 2016). Overall, these

findings are consistent with the interpretation that educational mediation and task authenticity, rather than mere exposure to technology, may have played an important role. Nevertheless, this interpretation remains tentative given the absence of a control group and should not be interpreted as evidence of a causal effect.

CHANGES BETWEEN PRE-TEST AND POST-TEST: MAGNITUDE, STATISTICAL SIGNIFICANCE, AND EFFECT SIZE (RQ2)

Despite the overall positive pre–post trends, individual difference scores reveal considerable heterogeneity in participants' responses. The largest mean change was observed for attitude towards AI ($M = 0.72$; $SD = 0.75$), followed by reflective and criterion-based approaches ($M = 0.29$; $SD = 0.41$), whereas technostress showed a more modest mean reduction ($M = -0.22$; $SD = 0.57$). The wide range of individual scores indicates that some students experienced substantial improvements, whereas others showed limited or even negative changes.

Such variability is consistent with previous research suggesting that engagement with AI is shaped by individual characteristics including digital self-efficacy, prior experience, trust, attitudes, and perceived control (Symasek et al., 2025; Kelly et al., 2023). Accordingly, the present findings suggest that students exposed to the same instructional experience may engage with GenAI in different ways, highlighting the importance of designing AI-supported assessment activities that accommodate diverse learner profiles rather than assuming uniform responses.

Inferential analyses confirmed statistically significant pre–post differences across all three dimensions. Wilcoxon tests indicated significant increases in reflective and criterion-based approaches ($W = 1033$; $p < .001$) and attitudes towards AI ($W = 439$; $p < .001$), together with a significant reduction in technostress ($W = 5774$; $p < .001$). Effect sizes were large for attitudes towards AI ($r = -0.890$) and reflective approaches ($r = -0.725$), whereas the effect for technostress was moderate ($r = 0.421$).

The larger effects observed for attitudinal and reflective dimensions are consistent with technology acceptance research, in which meaningful engagement with digital technologies has been associated with more favourable attitudes and perceived usefulness (Davis, 1989; Venkatesh et al., 2003). By contrast, the smaller reduction in technostress is consistent with literature describing emotional responses to technology as relatively stable and influenced by broader factors such as uncertainty, perceived complexity, and loss of control (Ragu-Nathan et al., 2008; Joo et al., 2016; Floridi et al., 2018).

Beyond statistical significance, these findings suggest that changes in students' perceptions may be associated not only with exposure to GenAI itself but also with its integration into a structured learning activity involving comparison with exemplars, iterative revision, and self-assessment. This interpretation is consistent with the evaluative judgement perspective (Tai et al., 2018), although, given the absence of a control group, it cannot be determined whether similar changes would have occurred following an equivalent learning activity without GenAI.

These findings should therefore be interpreted cautiously in light of the exploratory pre–post design, the absence of a comparison group, the use of self-report measures, and the relatively low internal consistency of the Reflective and Criterion-Based Approaches Scale. In particular, the modest reliability of this measure suggests that findings related to this construct should be considered with caution, as measurement error may have reduced the precision and stability of the observed associations and pre–post differences.

ASSOCIATION BETWEEN INITIAL LEVELS AND CHANGES AFTER THE GENAI EXPERIENCE (RQ3)

Results indicate that students' initial levels across the three dimensions were significantly associated with the magnitude of the observed changes following the learning experience. Significant negative correlations were found between pre-test scores and corresponding change scores for reflective and criterion-based approaches ($\rho = -0.421$; $p < .001$), attitudes towards AI ($\rho = -0.663$; $p < .001$), and technostress/computer anxiety ($\rho = -0.355$; $p < .001$). Overall, students with less favourable baseline profiles—lower openness towards AI, lower levels of reflective engagement, or higher technological discomfort—tended to exhibit larger changes following the intervention.

The strongest association was observed for attitudes towards AI, although similar patterns emerged for technostress and reflective approaches. Across all three dimensions, students with less favourable baseline profiles showed greater changes than those with more favourable initial scores. These findings are consistent with previous research suggesting that meaningful engagement with AI-supported learning activities may be associated with

more positive attitudes towards AI, lower technological anxiety, and greater confidence when pedagogical support is provided (Davis, 1989; Venkatesh et al., 2003; Ragu-Nathan et al., 2008; Joo et al., 2016).

The association observed for reflective and criterion-based approaches is also consistent with the interpretation that the learning activity may have provided opportunities for students with lower initial levels of reflective engagement to participate more actively in processes of comparison, revision, and criterion-based judgement, in line with the evaluative judgement perspective (Tai et al., 2018; Lipnevich et al., 2014; 2023.

Taken together, these findings suggest that students' initial dispositions may be an important factor in understanding how they engage with GenAI-supported assessment activities. Consistent with Symasek et al. (2025), individual differences appear to play a central role in AI acceptance and educational use. However, these associations should be interpreted cautiously, as correlations between baseline scores and change scores may partially reflect regression to the mean and the mathematical dependence between these variables rather than substantive relationships alone.

DIFFERENCES IN OBSERVED CHANGES IN RELATION TO INDIVIDUAL CHARACTERISTICS AND TOOLS USED (RQ4)

Comparative analyses did not reveal statistically significant differences in observed changes according to the individual characteristics examined or the tool perceived as most useful during rubric revision. Specifically, no significant differences emerged in changes in reflective and criterion-based approaches, attitudes towards AI, or technostress according to generational group or professional experience in school settings. Likewise, students who identified AI, exemplars, the combination of both, or neither as the most useful support did not differ significantly in either observed changes or perceptions of evaluative competence development and rubric improvement.

Overall, these findings suggest that the observed changes were broadly comparable across the groups considered. The absence of generational differences provides limited support for common assumptions that younger cohorts are inherently more predisposed to engaging with AI technologies, and instead is consistent with research suggesting that contextual and pedagogical factors may be more influential than generational membership alone (Symasek et al., 2025). Similarly, students with prior professional experience in school settings did not differ from those without such experience, indicating that the learning activity may have represented a relatively novel experience regardless of professional background.

The absence of differences according to the tool perceived as most useful is also noteworthy. Although many students identified GenAI as their primary source of support, while others valued exemplars or the combination of both, similar patterns of change were observed across groups. This finding suggests that the educational value of the experience may have been associated less with any single resource than with participation in a structured process involving comparison, revision, feedback, and reflection.

These findings should nevertheless be interpreted cautiously. The absence of statistically significant group differences does not imply that individual characteristics are unimportant. As shown in RQ4, students' initial dispositions were significantly associated with the magnitude of observed changes, suggesting that dispositional variables may be more informative than broad categorical characteristics such as age or professional experience. Furthermore, the relatively homogeneous sample - predominantly female Generation Z students - and the very small effect sizes observed in group comparisons may have limited the ability to detect meaningful between-group differences.

Future research should therefore examine these relationships using more heterogeneous samples and considering additional learner characteristics, including digital competence, prior familiarity with AI, technological self-efficacy, trust in AI, and self-regulation strategies.

CONCLUSIONS

This study explored the integration of GenAI into an authentic assessment and experiential learning activity centered on rubric construction, revision, and self-assessment by future primary school teachers. Overall, results seem to show that the GenAI experience is associated with positive changes in students' dispositions, with significant increases in reflective and criterion-based approaches and in attitude towards AI, accompanied by a reduction in perceived technostress/computer anxiety.

In line with the authentic assessment paradigm (Wiggins, 1990; Ashford-Rowe et al., 2014; Ajjawi et al., 2023), findings suggest that GenAI can play a pedagogically meaningful role when integrated into authentic, reflective, and intentionally designed activities. The experience appears to have fostered critical comparison, revision, and

development of evaluative judgement (Tai et al., 2018), supporting more informed, criterion-oriented modes of engagement in assessment processes. Consistent with Kolb's (1984) experiential learning model, the combination of rubric construction, comparison with exemplars and AI-generated feedback, revision, and self-assessment seems to have activated cyclic processes of reflection, re-elaboration, and product improvement.

Findings also align with the perspective of GenAI as an agent-to-learn-with (Salinas-Navarro et al., 2024), according to which AI can support dialogic, metacognitive, and reflective processes rather than merely automating tasks. In this sense, GenAI appears to have functioned as a cognitive and evaluative scaffold (Jonassen, 1996; Kim & Baylor, 2006), supporting students in critical revision, criterion-based comparison, and self-regulation of learning.

The study further highlights marked individual variability in observed changes. In particular, students with less favorable initial attitudes towards AI or higher technostress tend to show more substantial changes after the experience. These findings are consistent with literature on technology acceptance and individual differences (Davis, 1989; Venkatesh et al., 2003; Symasek et al., 2025), which emphasizes that attitudes, self-efficacy, trust, and initial dispositions significantly influence interaction with AI technologies in education.

At the same time, effects appear relatively transversal with respect to some socio-demographic and professional characteristics. The absence of significant differences by generational group, professional experience in school settings, or perceived most useful tool suggests that the formative value of the experience may depend more on the quality of pedagogical design and activity structure than on users' demographic or professional characteristics alone (Laurillard, 2012; Mishra & Koehler, 2006).

Nonetheless, results must be interpreted with caution. The sample is relatively homogeneous, consisting mainly of female (96.5%) Generation Z (83.3%) students from a single university, limiting generalizability. Furthermore, the absence of a control group and the self-report nature of measures do not allow firm causal attribution of observed changes to GenAI use or direct assessment of actual improvement in students' evaluative competences. Additional caution is warranted regarding the reflective and criterion-based approaches scale, which showed lower internal consistency than the other dimensions.

Future research could include more heterogeneous samples, performance-based measures, and longitudinal designs, and further examine individual variables such as technological self-efficacy, trust in AI systems, familiarity with AI, and prior digital competences. It would also be useful to explore different modalities of GenAI integration in authentic assessment processes, analyzing how varying levels of pedagogical mediation influence development of evaluative judgement, reflective competences, and self-regulation.

Overall, this study suggests that GenAI can be a promising resource to support authentic, reflective, and participatory assessment practices in higher education, provided it is integrated into pedagogically designed environments oriented towards the critical development of students' evaluative judgement rather than mere automation of assessment processes.

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APPENDIX A. Questionnaire: Perceptions, Attitudes, and Individual Differences in the Use of Artificial Intelligence for Formative Assessment

Section 1 – Alphanumeric Identification Code
Participants were asked to create an anonymous alphanumeric identification code.
Section 2 – Personal Information
(Group-analysis data only; non-identifiable information)
Age: _____
Gender:

- Woman
- Man
- Other
- Prefer not to say

Do you belong to one of the following generational groups?

- Gen Z (1997–2012)
- Millennial (1981–1996)
- Other / I do not know

Have you previously used assessment rubrics?

- Yes
- No
- I do not remember

Are you currently working in a school setting?

- Yes, in preschool education
- Yes, in primary education
- Yes, in other school levels
- No

Section 3 – Learning and Decision-Making Style
Response scale (self-anchoring 1–6):[Text Wrapping Break] 1 = Not at all true for me | 6 = Completely true for me

Item	Statement
1	I like learning by observing examples and reference models.
2	I tend to analyze educational situations systemically, looking for connections among elements.
3	I prefer making assessment decisions based on clear and structured criteria.
4	I feel more confident when I have a guide or framework to follow.
5	I tend to reflect on learning processes and on my own assessment criteria.

Section 4 – Attitudes Toward the Use of AI in Educational Contexts
Response scale (self-anchoring 1–6): [Text Wrapping Break] 1 = Not at all true for me | 6 = Completely true for me

Item	Statement
6	I feel comfortable using Artificial Intelligence tools in educational contexts.
7	I believe that AI can help me improve my assessment-related competences.
8	I find it interesting to explore the potential of AI for instructional design.
9	I feel motivated to use AI if it can provide personalized feedback.

10	I think that the use of AI can make assessment more objective and transparent.

Section 5 – Technostress and Technological Anxiety
Response scale (self-anchoring 1–6): [Text Wrapping Break] 1 = Not at all true for me | 6 = Completely true for me

Item	**Statement**
11	When I use new technologies, I feel anxious about making mistakes.
12	I feel stressed when I have to manage unfamiliar digital tools.
13	I am afraid of losing data or not being able to use AI-based tools correctly.
14	I would prefer to avoid the use of complex technologies in assessment.
15	Despite initial difficulties, I am able to adapt quickly to new digital tools.

Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Province, China

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ABSTRACT
The objectives of this study were to 1) investigate the efficiency of an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China, 2) compare students' achievements before and after learning through intelligent education management platform on encouraging the creative thinking habits, and 3) examine students' satisfaction of using intelligent education management platform on encouraging the creative thinking habits. The sample comprised 30 Grade 4 undergraduates in Yunnan Province, China, selected through purposive sampling. The instruments used for collecting the data were 1) an intelligent education management platform on encouraging the creative thinking habits for Grade 4 undergraduates in Yunnan Province, China, for advancing learning achievement, a student's pretest and a post-test, and a teacher satisfaction form. The statistical measures used to examine the data were percentages, mean, standard deviation, and the dependent-samples t-test. The results showed that 1) the efficiency of the intelligent education management platform on encouraging the creative thinking habits for Grade 4 undergraduates in Yunnan Province, China was 82.07/81.67, which was higher than the criteria set. 2) The post-test scores of the students who studied through the intelligent education management platform on encouraging the creative thinking habits were 81.67, SD 3.73, which indicated higher scores than those in the pretest of 40.80, SD 5.38, and the t-test between the pre-test and post-test was 35.01 at a significant level of .05. 3) The students' satisfaction with the intelligent education management platform in encouraging creative thinking habits for Grade 4 undergraduates in Yunnan Province, China, received a high satisfaction level as a whole at an average of 4.49.
Keywords: intelligent education management, encouraging creative habits

INTRODUCTION

In 21st-century China's higher education system, educational institutions in Yunnan Province need to cultivate graduates who possess both academic knowledge and innovative thinking skills, adaptive thinking, and the ability to integrate creative ideas. This requires the development of teaching processes and methods to cultivate competencies that drive problem-solving in a knowledge-based society. China's educational reforms have emphasized innovative learning and entrepreneurship. China has restructured its education system as a key national strategy, defining the function of innovation and entrepreneurship education (IEE). This entails integrating vocational education with inventiveness and entrepreneurship to meet manufacturing needs and designing curricula and personnel training models that correspond with regional industrial development (Lv, M., Zhang, H., Georgescu, P., Li, T., & Zhang, B., 2022).

Critical thinking activities based on the Self-Regulated Learning (SRL) framework are an effective achievement testing process intended for enhancing 21st-century teaching capabilities. It stresses the incorporation of technology and creativity to improve student learning outcomes, as evidenced by higher post-test scores compared to pre-test scores (Sangsawang, T., 2020).The educational goals of SRL theory are developed through student-centered online instructional design. The learning process applies digital technology to aid decision-making and systematic management strategies to improve instructional efficiency and student outcomes. Educational data analysis can greatly improve the learning environment and improve teaching and management efficiency (Yang, W., & Sangsawang, T., 2026).

However, this emphasis on developing a creative identity among undergraduate students is still lacking. The limited focus on innovation-oriented teaching and management within classic educational systems restricts students' ability to cultivate creativity, which is important for modern education. Many universities lack successful

management strategies that integrate creativity development into institutional policies, curriculum design, and teaching methods. Cultivating creativity at Yunnan universities is a key challenge (Li, M., & Mu, A., 2025).

A survey of student creativity at universities in Yunnan province, China reveals that it is shaped by several factors, including leadership, systematic management or integration within the educational structure, student-teacher relationships, student self-confidence, the cultivation of innovative behaviors, and the lack of intelligent educational management systems applying advanced technologies such as artificial intelligence, data analytics, and digital resources to assist personalized and personalized adaptive learning. While such systems have the capacity for enhancing creativity through flexible learning environments and live feedback, their implementation in many universities is limited. As a result, the opportunities to foster creative behavior through technologically advanced management have not been fully realized. Fourth-year undergraduate students face increasing pressure regarding employment and graduation requirements, focusing more on scholastic achievement and job preparation than on developing creativity and innovative management skills. Students may graduate devoid of the necessary creative abilities for the modern workplace. Therefore, a key issue identified in this research is the lack of effective intelligent educational management approaches that promote and support the development of creative customs among fourth-year undergraduate students in Yunnan Province, China.

Therefore, universities should design learning experiences that support the progressive development of students' competencies and promote innovative learning behaviors. Teaching should move away from traditional and rigid management structures to unconventional approaches to reduce limitations on the creative potential of students. There is an increasing need to integrate smart education approaches to foster creative behavior among undergraduate students.

LITERATURE REVIEW

Intelligent Education Management (IEM) and the cultivation of creative habits within fourth-year undergraduate students in Yunnan Province, China. As final-year students face the transition from university life to the working world, AI-driven management systems serve an important function in moving past rote learning to higher levels of creative thinking. The IEM provides traditional Chinese higher education institutions with the main benefit of improving the knowledge discovery process through more effective use of resources, data, technical infrastructure, digital competence, and joint skills, and by encouraging an attitude of intrinsic motivation. Undergraduate teaching reforms thus shift from "examination" to "potential enhancement," focusing on attendance and behavioural analysis and giving personalized feedback as a foundation for creative expression. Adopting artificial intelligence (AI) has advantages, helping to stimulate creativity and engagement, but also tackling limitations in creativity, a lack of affective engagement, and anxiety about academic performance. Managing the effective use of AI in the education system is important. An integrated learning environment using artificial intelligence improves the efficiency of systematic learning and creativity between students and teachers. A group of 120 students faced strict frameworks that limited creativity and innovation. Repetitive, impersonalized interactions with AI increased anxiety about academic performance based on AI assessments, and technical frustrations hindered the learning process. In contrast, AI ignited creativity, new ideas, problem-solving methods, and greater engagement through interactive features. Quantitative data also shows that teachers and students have positive attitudes about the benefits and challenges of AI applications. Adding AI to educational apps has a double effect on college students' creativity and academic and psychological well-being, boosting both. Some of the main challenges are creative limitations, limited affective involvement, anxiety about academic performance, balancing these factors, rigorous implementation, and continuous assessment, all of which are necessary for the best results(Lin, H., & Chen, Q., 2024)

Activities Promoting Creative Behavior for 4th-Year Undergraduate Students. Creative behavior is a key outcome, covering thesis, internship, and graduation project. "Intelligent Education Management" encourages creative behavior as follows: (a) Project-Based Learning with AI (PBL): Activities are designed to encourage creative use of AI tools, such as ChatGPT or LLM in China, which serve as assistants for managing repetitive data tasks. When routine tasks are automated, students can then focus on developing their analytical, critical, and analytical problem-solving skills, (b) Building on this, Collaborative Learning with Artificial Intelligence uses G4-style collaborative learning, assigning leadership roles alongside AI-powered consensus-building. Intelligent management systems monitor interactions in real-time and provide immediate positive feedback, (c) Blended Learning with AI: By providing regional datasets and business trends, technological empowerment enables students to apply innovative problem-solving to local challenges, such as sustainable tourism or the preservation of ethnic culture, (d) Integrating a competitive mechanism is another driver of creativity in the Yunnan University context, providing structured opportunities for students to create while being supported by intelligent management systems that help manage and monitor competition. Applying artificial intelligence (AI) into learning activities helps develop students' diverse thinking skills. Learning activities can more effectively focus on creative design

processes, becoming student-centered and fostering engaged participation and skills in out-of-the-box thinking, design thinking, self-confidence, creativity, and reflective thinking(Saritepeci, M., & Durak, H., 2024).

Smart education refers to the application of artificial intelligence-powered systems, data analytics, and technology to improve the planning, delivery, and evaluation of education. Personalization, automation, and analytics-based decision-making enable institutions to customize learning experiences for each individual student. Smart technologies such as learning platforms, chatbots, and virtual digital simulations allow teachers to track student progress, predict learning outcomes, and deliver focused support. These supporting tools for both academic management and instructional design create a streamlined learning setting, boost resource management and stakeholder interaction, and form a holistic ecosystem that supports the entire teaching and learning process (Koshiry, A., & Tony, M., 2025).

Smart technologies in higher education integrate AI and change traditional teaching. Asa result, these advances create intelligent, interactive, student-centered environments. Main benefits include increased pupil engagement, more effective personal learning, and improved analytical thinking and problem-solving skills. AI-driven learning systems are redefining learning environments to respond to diverse learning needs and encourage pupil engagement, causing improved student motivation, interaction, and academic performance, and promoting closer connections between students and learning content (Z., Yu, C., & Yao, G., 2024).

Creative habits refer to consistent behaviors, such as flexibility and reflective thinking. These habits are integral to modern education systems, which emphasize problem-solving, project-based, and collaborative learning to actively develop and nurture students' creativity. The project-based learning curriculum was integrated with a thinking-pairing strategy to assess the effectiveness of developing creative thinking skills in education students. The curriculum featured five interconnected components: First, project preparation introduced students, formed pairs, and established a shared understanding of the project. Next, during pair work, students discussed, developed a shared knowledge framework, analyzed practice, brainstormed, and provided feedback within pairs. Project production followed, encompassing development, testing, revision, and presentation. Subsequently, students participated in project evaluation, offering feedback to other pairs. Finally, the project concluded with a reflection on overall experiences and the key elements of fluency, flexibility, originality, and elaboration. As a result, a post-course assessment showed students perceived improvement across all aspects of creative thinking (Li, M., & Tu, C., 2024).

The role of smart education in promoting creative behavior is achieved through several mechanisms,including: (a) Personalized learning: AI systems personalize learning content and strategies to suit individual needs based on individual differences and interests. This personalization fosters intrinsic motivation and curiosity, key drivers of creativity, (b)Adaptive reflection: Intelligent systems provide real-time feedback and analysis, enabling students to reflect on their learning processes, supporting the development of metacognitive skills for creative thinking, (c) Interactive and immersive learning environments: Technologies such as virtual reality, simulations, and game platforms create learning experiences that encourage experimentation and innovation, (d) Supporting collaborative learning: AI tools facilitate collaboration through smart grouping, peer feedback systems, and communication platforms, enhancing creativity and team idea generation, (c) Data-driven instructional design: Educators can use data analytics to design creative-focused activities such as open-ended projects and interdisciplinary integrated assignments. (Guettala, M., Bourekkache, S., Kazar, O., & Harous, S., 2024).

Applications of IEM to develop creativity include Over-reliance on technology reduces human interaction, hindering creativity and emotional development. Ethical and privacy concerns associated with AI data collection and decision-making. Lack of teacher training to effectively integrate AI into teaching. Fostering creative habits among final-year undergraduate students. Creativity is one of the most sought-after skills in the digital age. Designing and producing multimedia materials, including creativity assessment tools, self-assessment creativity tools, infographic assessment tools, and questionnaires on attitudes towards infographic design, resulted in significantly higher student creativity scores across all components, such as originality, fluency, flexibility, and elaboration. Developing appropriate and effective methods to boost student confidence and encourage out-of-the-box thinking was crucial (Amnouychokanant, V., 2023).

Intelligent Management and Creative Habits. Intelligent education management systems can foster the development of creative habits by enabling personalized, encouraging exploration, critical thinking, and reflective practice. Additionally, AI integration in classroom settings may facilitate a shift from traditional instruction toward learner-driven, innovation-oriented learning activities (Huang, J., & Chano, J., 2025).

Psychosocial and Institutional Factors. Beyond technology, research also underscores the importance of psychological and institutional factors in the development of creativity. Studies show that teachers', and students' self-esteem positively influence creative outcomes, suggesting that intelligent educational management should be coupled with social and motivational support structures to maximize the cultivation of creative habits. Emerging evidence suggests that integrating these elements can create dynamic learning ecosystems that encourage sustained creativity and innovation (Transforming higher education for the knowledge economy: Enhancing creative thinking and problem-solving skills through collaborative learning, 2025) (Wang et al., 2020).

METHODOLOGY

Population of the sample: the research used a population of 350 Grade 4 undergraduate students in Yunnan, China, to test the use of the Intelligent Education Management on Encouraging Creative Habits system. The sample comprised 30 Grade 4 undergraduate students in Yunnan, China, obtained using a purposive sampling technique. The sampling method is detailed in Table 1.

Table 1: Basic information on study subjects (N=350)

Demographic variables	Category	Frequency	Effective percentage (%)
Gender	Male	110	31.43%
	Female	240	68.57%
Age	18-20 years old	206	58.86%
	21-25 years old	144	41.14%

From the data table, the number of female survey participants significantly exceeded male participants, at approximately 37.14 percent. The age groups with the highest proportions were 18-20 years and 21-25 years, at 58.86 percent and 41.14 percent, respectively.

Research Instrument; investigate the efficiency of an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China,The instruments used for collecting the data were an intelligent education management platform on encouraging the creative thinking habits for Grade 4 undergraduates in Yunnan Province, China for enhancing learning achievement, a student's pretest and a post-test, and a teacher satisfaction form: 1) An intelligent educational management platform to promote creative thinking behavior of Grade 4 undergraduates students in Yunnan Province, China. (a) Develop a curriculum to interview teachers and other stakeholders. Identify problems in traditional teaching methods, including difficult content, outdated media, and limited teaching materials and activities. (b) Design a framework that integrates intelligent teaching, creative thinking, and self-directed learning. Use online learning for content delivery. Facilitate in-class discussions to foster engagement. Promote teamwork for collaborative understanding. (c) Design a system to identify platform components, including course websites, AI tools for content recommendations, and learning-tracking dashboards. Leverage intelligent technologies like AI, big datasets, and cloud storage. Make the website and app user-friendly for Chinese students. (d) Plan activities that promote creativity, such as problem-solving, brainstorming, and project work. Create educational videos, charts, and games. Organize activities according to the P-OIITT steps. (e) Create a platform with web and mobile applications that link to a student database. Add features such as intelligent content recommendations, learning tracking, and instant feedback. (f) Test the platform's performance in encouraging creative thinking habits across 3 phases., (g) Evaluate pretest and posttest results. Check creativity, review learning data, and view results with simple statistics. (h) Continuously develop by using feedback and data. Make the AI smarter and update activities and content regularly, 2) Test the platform's performance in encouraging creative thinking habits across three phases; *Phase 1,* Individual with 3 students; *Phase 2*, small-group trial with 9 students, with improvements based on feedback; *Phase 3*, field test in a real classroom. (i) Evaluate pretest and posttest results. Check creativity, review learning data, and view results with simple statistics. (j) Continuously develop by using feedback and data. Make the AI smarter and update activities and content regularly, 3) Create a questionnaire on "Students' Satisfaction of Using Intelligent Education Management Platform to Encourage Creative Thinking Habits," follow these steps: (1) Defining the Research Objective: Clearly state the goal, such as measuring student satisfaction with how the platform promotes creative thinking, (2) Identifying Key Constructs: Base the questionnaire on frameworks: (a) System Quality: usability, stability; (b) Information Quality: content clarity, timeliness; (c) Service Quality: support, responsiveness; (d) Learning Experience: participation, interest;(e)Creative Thinking Support: idea stimulation, problem-solving; (e)Overall satisfaction, (3) Item Generation: Create questions that cover all variables. System Quality: The platform is easy to use. The system runs smoothly without errors. Creative Thinking Support, the platform, encourages me to think creatively. I can generate new ideas through this platform.(4)Scaling Methode (a 5-level Likert scale, e.g., 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree), (5) Content Validity; Have 3–5 experts evaluate, using the Index of Item-Objective Congruence, Acceptable value: IOC ≥ 0.50, (6)Pilot Testing: Test the questionnaire with a small sample group of

30 people to check the understanding of the questions and revise the questions before actual use,(7)Reliability Testing: Use Cronbach's Alpha. Acceptable value ≥ 0.70,(8) Construct Validity: Analyze with Factor Analysis. (EFA/CFA), Check factor loading > 0.50, (9) Final Questionnaire Structure: The questionnaire should be divided into 3 parts: Part 1: Demographic information, gender, age, field of study, and platform usage experience. Part 2: Satisfaction Constructs, with 23 questions based on key constructs;Part3: Open-Ended Feedback, for additional suggestions, and (10) Data Collection and Ethics: Obtain informed consent from respondents, maintain data confidentiality, and use data for research purposes.

The statistical devices used for analyzing the data were percentage, mean, standard deviation, and the t-test for the dependent sample. This research uses SPSS 22.0 to describe and statistically analyze the current state of the potential of Intelligent Education Management to encourage creative habits among Grade 4 Undergraduates in Yunnan, China, and the influential factors affecting Grade 4 undergraduates in Yunnan Province, China. AMOS 17.0 was then used to analyze the preliminary relationship between teachers' ability to teach using Intelligent Education Management to encourage creative habits and the influential factors. This is followed by a structural model analysis of the transformation of effective classrooms towards teaching using Intelligent Education Management to encourage creative habits. The research also examines the relationship between Intelligent Education Management and Encouraging Creative Habits, adaptability to educational tasks, a conducive environment for teaching, and the social impact of teaching using Intelligent Education Management on Encouraging Creative Habits. Finally, the mechanisms influencing the transformation towards effective teaching using Intelligent Education Management on Encouraging Creative Habits in classrooms are analyzed.

Procedure; Operational Procedure 1) Study the effectiveness of applying conflict resolution strategies for intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China, to improve academic achievement of intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China. The students 'considering the E1/E2 = 80/80 value (Chaiyong Brahmawong, 2015). (E1) is the percentage of the average score or the average of all scores students received from activities or homework such as exercises, practice, projects, and formative assessments. (E2) is the percentage of the average score or the average of all scores students received from post-tests, final exams, and evaluations. The effectiveness of applying conflict resolution strategies for intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China. The students to improve student academic achievement was evaluated by 3 content experts and 3 media experts. The quality of the application's content regarding conflict resolution strategies for intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China, to improve student academic achievement was evaluated according to the perceptions of content experts who work in the field of conflict resolution strategy planning for students. Media professionals working in conflict resolution strategy planning, Computer technology and education, or related fields were asked to evaluate the appropriateness of the content used in the application on conflict resolution strategies for students. The researcher followed these steps; *First Step;* the evaluation in this research was developed in line with the study's hypothesis. Therefore, the questionnaire was developed based on the two theories used in this study. The study showed that the use of an application on conflict resolution strategies for intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China, improves the academic achievement of Grade 4 undergraduate students in Yunnan Province, China. The questionnaire had two main parts. Part 1;the first part aimed to measure expert opinions on the use of technology, specifically the application on conflict resolution strategies for an application based on conflict resolution strategies for Grade 4 undergraduates in Yunnan Province, China, to improve academic achievement in Yunnan Province, China. This part was a closed questionnaire using a five (5) point Likert scale. Participants were asked to rate their agreement with each statement on a scale of 1-5. The interpretation of each numerical value is detailed below.

Table 2: Range of mean and verbal interpretation

Range Value	Verbal Interpretation
4.50-5.00	Excellent
3.50-4.49	Good
2.50-3.49	Average
1.50-2.49	Poor
1.00-1.49	Very Poor

An open-ended questionnaire was used to ask participants to provide comments and feedback on the application of conflict resolution strategies for intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China, in teaching planning. *Second Step*; Three measurement and

evaluation experts with expertise in education or measurement and evaluation were asked to assess the language of the questionnaire prior to evaluation. This data was used to calculate the Objective-Relevant Conformity index (IOC). The evaluation experts assessed the content quality of the IOC index and found it to be It means excellent validity every expert looked at the items and thought, "Yes, this aligns beautifully with the objectives." In practical terms, anything above 0.80 is considered strong, so 0.95 is borderline overachieving. The evaluation results are detailed below. Subsequently, the evaluation was reviewed by content experts for further evaluation. Measurement and evaluation experts assessed the outcomes as measured by the IOC index and found it to be 0.93. Later, media experts conducted an evaluation to facilitate further evaluation. Therefore, a cumulative average score of the IOC index exceeding 0.5 is considered acceptable. Objective-relevant conformity was evaluated using the following criteria, as shown in Table 3.

Table 3: Value of Item Objective Congruence index and verbal interpretation

IOC ≥ 0.50	Item is considered congruent with the objectives. Acceptable (bare minimum survival)
IOC ≥ 0.80	Item is considered congruent with the objectives. Good (respectable academic citizen)
IOC ≥ 0.90	Item is considered congruent with the objectives. Excellent (publishable without embarrassment)

The total mean score of the IOC index is supposed to be higher than 0.5 for acceptable data. *Third Step*; The experts will use the assessment of content quality aspects of intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China; to enhance learning achievement of intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China for content experts and the assessment of media quality aspects of intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China a teaching for media experts.

The achievement assessment (Pretest and Posttest); a pretest and posttest shared the same items. Both contained 40 questions related to Chinese reading that they had learned in class: 20 items contained Chinese reading taught using an intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China, and the other 20 items contained Chinese reading taught using a traditional teaching Approach. The students were assigned to complete the Pretest before learning Chinese through an application on strategies for conflict resolution for an intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China and then take the posttest after learning via intelligent education management on Encouraging Creative Habits in this approach. The researcher went through the following steps: *First Step*; The researcher selected the test types. Multiple-choice tests were chosen to use in the study, *Second Step*; The second section of the questionnaire has been developed to measure students' academic Achievement in an intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China. *Third Step*; Three measurement and evaluation experts who work in the field of measurement and evaluation or education were asked to check the congruence between objectives and items in the test. The data obtained were used to calculate the IOC index. The evaluation criteria were used for checking the congruence between objectives and items of the test as follows the value of the IOC index and verbal interpretation of achievement assessment. The total mean score of the IOC index is supposed to be higher than 0.5 for acceptable data, *Fourth Step*: both the pretest and posttest were administered to 30 first-year undergraduate students in Yunnan Province, China majors who had an Application on Strategies for Conflict Resolution subjects and were enrolled at an intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China but were not part of the study sample. After the tests have been administered, they are used to determine the difficulty index, discrimination index, and reliability index of the achievement test. It was found that the difficulty index should be between 0.2 and 0.8, the discriminant index should be 0.2 or higher, and reliability should be 0.8 or higher, using Kuder-Richardson's K-R20 formula, *Fifth Step*; the pretest and posttest are used with participants to explore their knowledge before and after learning via intelligent education management on Encouraging Creative Habits for Grade 4 undergraduates in Yunnan Province, China.

The questionnaire on students' satisfaction with an Application on Strategies for Conflict Resolution for first-year undergraduate students in Yunnan Province, China. The questionnaire was used to gather Application on Strategies for Conflict Resolution for an application based on conflict resolution strategies for first- year undergraduate students in Yunnan Province, China. The researcher took the following steps. *First Step*; the questionnaire in this study has been developed to fit the study hypothesis. Consequently, it was developed based on both theories that have been utilized in this study. The study demonstrates that utilizing application on strategies

for conflict resolution for an application based on conflict resolution strategies for first- year undergraduate students in Yunnan Province, China, as outlined in the enhances learning achievement in the teaching of Career Development and Career Planning subjects at Yunnan Province, China. The questionnaire has two main sections, each with its own aim. *Part 1*: The first section aims to measure students' satisfaction with online learning platforms. This part was a close-end questionnaire that was based on the five (5) point Likert-type scales. The participants were asked to rate their degree of agreement with each statement on a scale of 1-5. The interpretation of each Number is described as follows (5 meaning Strongly agree; 4 meaning Agree; 3meaning Undecided; 2 meaning Disagree; 1 meaning Strongly disagree).

Data collection

Step 1: Introduce students to an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Provence, China.

Step 2: Administer the teacher's Pretest to receive the score.

Step3:Conduct learning activities with students by utilizing lessons through an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Provence, China subject teaching.

Step4:Administer a post-test to students after they have studied an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Provence, China and analyze the scores using statistical methods.

Data and Statistical Analysis:

The researcher conducted the data analysis using the following procedures: Find the efficiency of an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Provence, China, as indicated by E_1/E_2 = 80/80 (Chaiyong Brahmawong, 2009). (E_1) is the percentage of the average or means of all scores the students earn from their activities or assignments, such as drills, exercises, project work, etc., or other types of formative evaluation. (E_2) is the percentage of the average or means of all scores the students earn from their posttest, final examinations, and other summative evaluations. Compare the achievement test results before and after using information technology, as per the ADDIE model, in Chinese subject teaching to enhance the learning achievement of Shunde Polytechnic students in China, using a dependent t-test. Study the satisfaction of students in an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Provence, China, using mean and standard deviation. The basic statistics in data analysis are the formula for calculating the arithmetic mean ($\bar{x}$), The formula for calculating the Standard Derivation (SD), The formula used to determine the quality of the instruments was: In finding content validity of the achievement test, we conducted the IOC index formula, The formula used in finding the difficulty index of the achievement test were Range of difficulty index and verbal interpretation. The formula for calculating the item discrimination of the achievement test is Range of discrimination index and verbal interpretation. The formula for calculating the reliability of the achievement test K-R20 by Kuder-Richardson is the formula for calculating the variability of the achievement test is the formula used to verify the hypothesis: the formula used in analyzing the differences in achievement scores using the dependent t-test.

RESEARCH RESULT

Intelligent Education Management on Encouraging Creative Habits for Grade 4 undergraduates;

Blended online teaching, as informed by an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Province, China, often abbreviated as IT, refers to the use of computer systems and communication equipment to process, store, transmit, and manage digital information. It encompasses various software, hardware, and network infrastructures for effectively collecting, storing, analyzing, and sharing information. In addition to introducing the basic concepts of information technology, this field also involves addressing common problems and providing solutions, such as seeking expert technical support. To access assistance, one can contact the technical support team of their school or educational institution, consult online technical support communities and documentation, or refer to the help documents and video tutorials available on the associated teaching platform. In the Basic Computer Application subject, teaching on an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Province, China. The instruction involves using the design process. In the current study, the researcher developed blended online instruction in line with intelligent education management to encourage creative habits among Grade 4 undergraduates. Information technology. The details are provided below: *1) Analysis:* Using blended teaching online according to an Intelligent Education Management on Encouraging Creative Habits for Grade 4 Undergraduates in Yunnan Province, China, is necessary to analyze it first. Research needs to explore students' backgrounds, ability levels, learning needs, and expected goals for blended teaching, according to the ADDIE model, and to combine this with online education, intelligent education management, and the encouragement of creative habits among Grade 4 undergraduates. In intelligent education management to encourage creative habits,

learners need specific, integrated online instruction, aligned with intelligent educational management, to encourage creative habits among Grade 4 undergraduates. Information technology, as well as comprehension ability in learning and teaching via intelligent education management to encourage creative habits, *2) Design:* After analyzing the students' background and needs, we can begin designing the curriculum. In blended online teaching, guided by intelligent education management to encourage creative habits, it is necessary to analyze this first. Research must explore students' backgrounds, ability levels, learning needs, and expected goals, align instruction with intelligent educational management, and encourage creative habits. According to the ADDIE model of combined education and intelligent education management, encouraging creative habits, as well as learning comprehension ability. Therefore, we need to design a combined instruction based on intelligent education management to encourage creative habits applications, the ADDIE model for blended online teaching, and intelligent education management to encourage creative habits. Researchers need to set clear course objectives and teaching strategies. Course objectives should be measurable and closely related to students' career and learning needs. Teaching strategies can include using multimedia resources, introducing examples and visual data, and other methods to improve students' vocabulary and reading comprehension. *3) Development:*According to the ADDIE paradigm, it is essential to conduct an initial analysis of intelligent education management to encourage creative habits applications. To conduct a comprehensive examination, researchers must assess several aspects of students' profiles, including their educational background, proficiency level, specific learning needs, and anticipated educational objectives. A preliminary analysis is essential for implementing blended online teaching, specifically through intelligent educational management to encourage creative habits. A preliminary examination is necessary to implement blended online instruction, specifically through intelligent educational management to encourage creative habits. To conduct a thorough analysis, researchers must consider students' educational backgrounds, proficiency levels, learning needs, and goals. In intelligent education management, encouraging creative habits is implemented using the ADDIE model. To effectively engage with the Basic computer application curriculum, learners must possess specific skills in blended online instruction, as prescribed by intelligent education management to encourage creative habits, and a proficient level of reading comprehension. Hence, researchers must develop a blended online teaching approach based on intelligent education management to encourage creative habits. This approach should be designed following the ADDIE model for blended online teaching, while also considering learners' proficiency in combined online teaching, as per intelligent education management, to encourage creative habits among Grade 4 undergraduates. Hence, researchers must develop a blended online teaching approach grounded in intelligent educational management to foster creative habits. This approach should adhere to the ADDIE model for combined online teaching while considering the learners' proficiency in intelligent education management to encourage creative habits skills. Hence, researchers must devise an integrated online teaching approach grounded in intelligent educational management to encourage creative habits among Grade 4 undergraduates, following the ADDIE model for blended online teaching. Consequently, the next step is to develop the curriculum. Developing a curriculum involves implementing teaching practices derived from the analysis and design phases and utilizing instructional materials. When implementing intelligent education management to encourage creative habits among Grade 4 undergraduates through blended online education, it is essential to conduct a thorough analysis beforehand. To conduct a comprehensive study, researchers must investigate several aspects of students, including their educational history, proficiency level, individual learning needs, and expected outcomes. According to intelligent education management to encourage creative habits among Grade 4 undergraduates is implemented through blended online teaching using the ADDIE model. To effectively engage with the primary computer application curriculum, learners must possess specific skills in combined education online, as prescribed by intelligent education management to encourage creative habits for Grade 4 undergraduates, and a proficient level of reading comprehension. Therefore, developing a blended online teaching approach grounded in intelligent educational management to encourage creative habits among Grade 4 undergraduates when teaching basic computer applications is crucial. This instructional design should adhere to the ADDIE model for blended online teaching and align with intelligent educational management to encourage creative habits among Grade 4 undergraduates in basic computer application instruction. In this context, educators can incorporate a range of teaching resources, such as news articles, magazines, and industry reports, to enhance the learning experience. Simultaneously, integrating the Internet, video, animation, and other multimedia resources can enhance the efficacy of student learning. *4) Implementation:*The next step is to implement the lesson plan after developing the blended teaching according to the ADDIE model of combined online education. Based on the intelligent education management on encouraging creative habits for Grade 4 undergraduates in Yunnan province, China. During this phase, it is essential to make necessary adjustments to the curriculum to meet students' specific needs and goals. It is also crucial to ensure that teaching methods and resources are adaptable to variations and continuously improved. *5) Evaluation:*Following the implementation phase, it is imperative to thoroughly evaluate blended online teaching in line with intelligent education management to encourage creative habits among Grade 4 undergraduates in Yunnan province, China. This assessment should encompass both student learning outcomes and the quality of the instructional process. Various methods can be used to assess student learning outcomes, including exams,

questionnaires, and student feedback. Additionally, the teaching process can be evaluated through reflective meetings and other measures to gain insights into future course improvements. Using intelligent education management to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China, can enhance students' learning outcomes, leading to more effective course design and improved teaching quality. By following the five steps of analysis, design, development, implementation, and Evaluation, we can achieve our curriculum objectives and provide better teaching services to our students. *6) Procedure:In the initial phase*, the researcher examined existing ideas on online blended teaching, focusing on intelligent educational management to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China. This examination formulated questions for the pretest, posttest, and questionnaire to assess knowledge and understanding of basic computer measuring. In *the second step* of the study process, the researcher, adviser, and other specialists in the field conducted a thorough assessment of the pretest, posttest, and questionnaire. In *Step 3* of the study, the pretest, posttest, and questionnaire were administered to a sample of 30 students enrolled in a blended online course on intelligent education management that encouraged creative habits among Grade 4 undergraduates. It is important to note that these students were not part of the study's participant group. In *Step 4*, a cohort of 30 students from Yunnan province, China, who were enrolled in a blended online course using intelligent education management to encourage creative habits among Grade 4 undergraduates, were tasked with completing a pretest. The test lasted around one hour. In Step 5, the researcher developed a teaching plan using the ADDIE model, with an explicit focus on intelligent educational management and on encouraging creative habits among Grade 4 undergraduates in Yunnan Province, China. The teaching plan was created for blended online instruction in line with intelligent education management, encouraging creative habits among Grade 4 undergraduates. The researcher's advisor and specialists in the field of intelligent education management on encouraging creative habits among Grade 4 undergraduates in Yunnan province, China, using the ADDIE methodology, with an explicit focus on basic computer applications. Subsequently, participants were tasked with completing both the posttest and questionnaire. The test lasted around one hour. This study aims to assess the effectiveness of blended online teaching, using intelligent education management, in encouraging creative habits among Grade 4 undergraduates in Yunnan Province, China. (1) This study aims to ascertain the utilization of intelligent education management on encouraging creative habits for Grade 4 undergraduates within the framework of the ADDIE model to enhance the academic achievement of students enrolled in intelligent education management on encouraging creative habits for Grade 4 undergraduates, with a specific focus on Basic computer application instruction. The study will be guided by a balanced E_1/E_2 ratio of 80/80. According to (E_1), the percentage is derived from the average (mean) of all students' scores across various activities and assignments, including drills, exercises, project work, and other formative evaluations. The variable denoted as E_2 represents the proportion, expressed as a percentage, of the average (mean) of all scores achieved by students on their posttests, final examinations, and other summative assessments. The present study evaluates the implementation of blended online education, specifically using intelligent educational management to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China. The Evaluation was conducted by a panel of three subject matter experts and three media experts. The present study aims to evaluate the quality of content features in blended online education, with a specific focus on the Basic Computer Application course at the Technical Vocational College in Yunnan Province, China. The assessment will be conducted using intelligent education management to encourage creative habits for Grade 4 undergraduates, with a particular emphasis on the perspectives of content specialists. The content specialists at Technical Vocational College in Yunnan province, China, who specialize in Basic computer applications, were asked to assess the suitability of the content used in the online, blended teaching approach, specifically regarding intelligent education management and the encouragement of creative habits for Grade 4 undergraduates. The present study examines the assessment of online combined teaching, guided by intelligent education management, to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China. The Evaluation targets media experts. A request was made for media professionals specializing in information technology, computer technology, educational technology, or related fields to evaluate the suitability of media used in online blended Learning, specifically regarding intelligent educational management to encourage creative habits among Grade 4 undergraduates in Basic computer skills. The researcher conducted the activities enumerated below. *Step 1:* The assessment in this study has been developed to fit the study hypothesis. Consequently, it was developed based on both theories utilized in this study. The study shows that using blended online teaching, guided by intelligent education management, to encourage creative habits among Grade 4 undergraduates in Yunnan province, China, enhances the learning achievement of Technical Vocational College students in Yunnan province, China. The questionnaire has two main sections. *Part 1:* The primary objective of this section is to survey industry professionals about their experiences with blended online teaching, aligned with intelligent education management, to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China. This section consisted of a closed-ended questionnaire structured along a Likert-type scale and included five (5) point questions. Participants were asked to indicate, on a scale from 1 to 5, how much they agreed with each statement. The meanings of each number are as follows: 5 = excellent, 4 = good, 3 = average, 2 = poor, and 1 = very poor. *Part 2:* This section consisted of an open-ended questionnaire. The participants requested to use blended online

teaching, following the intelligent education management to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China. *Step 2:* Before administering the assessment, three experts in educational measurement and evaluation were asked to assess the appropriateness of the language used in the questionnaire. The data obtained were used to calculate the Item Objective Congruence Index (IOC). The results of the evaluation assessment of content quality of the item objective congruence index (IOC) by measurement and evaluation experts found that the value of the item objective congruence index (IOC) was 0.93. The assessment was then sent to content experts for further evaluation, and the results of the evaluation assessment with media quality of item objective congruence index (IOC) by measurement and evaluation experts found that the value of item objective congruence index (IOC) was 0.93, and then the assessment was sent to media experts for further evaluation. Thus, the total mean score of the Item Objective Congruence (IOC) Index is supposed to be higher than 0.5 for acceptable data. The evaluation criteria used to check the congruence between objectives and items of the test were as follows: a value of the item objective congruence index (IOC) and verbal interpretation (+1item is considered congruent with the objectives, 0 item is considered neutral in terms of whether it is congruent with the objectives, 1 item is considered not congruent with the objectives. The total mean score of the Item-Objective Congruence (IOC) Index is supposed to be higher than .5 for acceptable data. ***Step 3:*** Experts will use the assessment. Evaluation of content quality aspects of information technology according to the ADDIE model, Basic computer application teaching for enhancing learning achievement of Technical Vocational College students in Yunnan province, China, for content experts, and the assessment of media quality aspects of blended instruction online according to the intelligent education management to encourage creative habits among Grade 4 undergraduates students for media experts. The pretest-posttest assessments evaluated students' comprehension of blended online instruction using the intelligent education management system to encourage creative habits among Grade 4 undergraduates in Yunnan province, China. The following questions focused on reading comprehension in basic computer applications and used a more traditional educational style. According to the ADDIE model on Basic computer application topic instruction, students must take a pretest before starting their studies. After Basic Computer Application, students took a posttest before moving on. Next, the researcher describes how to complete each phase. Early on, the researchers chose experiments. They chose multiple-choice questions for their investigation. The second part involves creating a questionnaire to assess students' academic performance in Basic computer applications using the ADDIE paradigm for instructional design. In step three, measurement and assessment, educational professionals must check the test's objectives and items. Data used to calculate the IOC. The evaluation criteria for assessing the test's goals and questions are explained in this section. In particular, the Index of Consistency (IOC) and achievement test verbal interpretation were examined. Consistency occurs when exam items match objectives. When assessing test item-learning objective alignment, an item 0% is usually considered neutral. An exam item with a score of -1 does not meet the goals. The aggregate mean IOC Index score must surpass 0.5 for data to be acceptable. Detailed data analysis is the fourth phase. 30 undergraduates in a Basic Computer Applications class took the pre-and post-tests. Although not part of the study's sample, the kids enthusiastically participated in testing. Achievement test indices are calculated from the results after administration and Evaluation. It includes the difficulty, discrimination, and dependability indexes. According to Kuder-Richardson's K-R=20 formula, the difficulty index should be between 0.2 and 0.8. The discriminant index should be .2 or higher, and the reliability should be .8 or higher. The study examined student satisfaction with the integration of technology in basic computer applications training at the Technical Vocational College in Yunnan Province, China. An ADDIE instructional design paradigm study measured students' satisfaction with online learning platforms and their attitudes toward the use of IT in education. Based on the study's hypothesis, three measurement and Evaluation specialists created and administered the questionnaire to evaluate the teaching of basic computer applications. Researchers assessed data alignment with aims using the IOC. Using questionnaire data, ADDIE will determine student satisfaction with IT-based Learning.

RESEARCH RESULT

This study offers a comprehensive examination of intelligent education management to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China, using the ADDIE paradigm and a descriptive analysis approach. The objective of the analysis was to enhance students' learning outcomes at the Technical Vocational College in Yunnan province, China, by imparting fundamental computer application skills. The findings are presented briefly in the table below. This report consists of two sections: Analysis Results and Descriptive Data Statistics. (1) This study examines the effectiveness of utilizing intelligent education management to encourage creative habits among Grade 4 undergraduates in Yunnan province, China, through the ADDIE model in teaching intelligent education management to encourage creative habits applications to students at the Technical Vocational College in Yunnan province, China. The study will be conducted by individuals E_1 and E_2 to enhance students' learning outcomes. In this study, we aim to compare students' learning achievement by analyzing pretest and posttest scores using intelligent educational management to encourage creative habits among Grade 4 undergraduates. The instructional approach employed in this study is based on the ADDIE paradigm and focuses on teaching intelligent education management to encourage creative habits applications. To assess the statistical

significance of the observed differences, we will utilize the t-test. This study aims to examine the level of satisfaction among students who use intelligent education management to encourage creative habits among Grade 4 undergraduates in the context of fundamental computer application training, using the ADDIE paradigm. Mean and standard deviation calculations will be used to measure satisfaction levels. The present discourse aims to conduct a comprehensive analysis of the subject matter at hand. The findings of the study indicate that. This study aims to examine the effectiveness of intelligent education management in encouraging creative habits among Grade 4 undergraduates and enhancing students' learning outcomes at the Technical Vocational College in Yunnan province, China, using the ADDIE model as a framework for basic computer application instruction. The present study investigates the impact of incorporating intelligent education management to encourage creative habits application training, using the ADDIE model, on students' learning success at the Technical Vocational College in Yunnan Province, China. Specifically, the study focuses on the use of intelligent education management to encourage creative habits among Grade 4 undergraduates and improve their learning outcomes.

Table 4: The report on the efficiency of blended teaching online according to the intelligent education management on encouraging creative habits for Grade 4 undergraduates in Yunnan province, China.

n=30

Items	Score	Score	Standard	Percentage	E_1/E_2
Ongoing	100	82.07	80	82.07	82.07/81.67
Posttest	20	14.22	80	81.67	82.07/81.67

From Table 4, the study found that the average mean score of ongoing assessments was 82.07, while the mean score of posttests was 81.67. These results suggest a significant improvement in learning outcomes through the implementation of blended online teaching, explicitly using intelligent educational management to encourage creative habits among Grade 4 undergraduates. The study focused on applying the ADDIE model to intelligent education management to encourage creative habits among Grade 4 undergraduates and enhance students' academic achievement at the Technical Vocational College in Yunnan Province, China. The findings indicate that the efficiency ratio of E_1 to E_2 ranged from 82.07 to 81.67. In summary, this study focuses on developing an online learning program based on the ADDIE model, specifically designed to improve students' academic achievement at a Technical Vocational College in Yunnan Province, China. The program adheres to the established 80/80 standard.

Table 5: The evaluation report of an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China from three content experts.

Evaluation Items	**M**	**SD**	**Result Interpretation**
1. Content-learning objective consistency.	5	.00	Excellent
2. Content is intriguing.	4.5	.00	Excellent
3. Content and activities are learner-friendly.	4.67	.58	Excellent
4. Content is appropriate for each activity.	4.55	.58	Excellent
5. Content sorting is appropriate.	4.38	.58	Excellent
6. Content accuracy.	5.00	.00	Excellent
7. Content reading is appropriate for learners.	5.00	.00	Excellent
8. Activities are consistent with the content.	5.00	.00	Excellent
9. A presenting approach engages students.	4.38	.58	Excellent
10. The overview of the content is complete.	5.00	.00	Excellent
Total	**4.49**	**.23**	**Excellent**

Table 5, blended teaching online according to the intelligent education management on encouraging creative habits for Grade 4 undergraduates from three content experts. The Evaluation comprises 10 items developed and approved by 3 subject-matter experts. This section represents the content experts' opinions using a 5-point rating scale. Each criterion rating is specified as depicted in the table provided below. The experts examined the quality evaluation of intelligent education management in encouraging creative habits for an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China. Quality was consistently high (M = 4.49, SD = .23). Findings indicate excellent content consistency, interest, accuracy, appropriate English-subject teaching, consistent activities, and a complete overview (M = 5.00, SD = .00). The posttest scores of the students who studied through the intelligent education management platform on encouraging the creative thinking habits were 81.67, SD 3.73, which indicated higher scores than those in the pretest of 40.80, SD 5.38, and the t-test between the pre-test and post-test was 35.01 at a significant level of .05. The students' satisfaction with an intelligent education management platform on encouraging the creative thinking

habits of Grade 4 undergraduates in Yunnan Province, China a, received a high satisfaction level as a whole at an average of 4.49.

Table 6: Results of Evaluation of blended teaching online according to the intelligent education management on encouraging creative habits for Grade 4 undergraduates in Yunnan province, China, by three media experts.

Evaluation Items	M	SD.	Result Interpretation
1. Learning through blended teaching online according to the intelligent education management on encouraging creative habits.	4.85	.58	Excellent
2. The sequence of activities and content is appropriate.	4.53	.58	Good
3. Easy to use, uncomplicated.	4.67	.58	Excellent
4. The images are consistent with the content.	4.33	.58	Good
5. The images convey the meaning.	4.42	.58	Good
6. The activities are appropriate for the learners.	4.00	.00	Good
7. Interesting content.	4.64	.58	Good
8. Interest in Learning.	4.33	.58	Good
9. Makes it possible to understand the content more.	4.33	.58	Good
10. The details are clear and easy to understand.	4.85	.58	Excellent
Total	4.50	.58	Good

Table 6: An intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China. In China, three media specialists help Technical Vocational College students master the fundamentals of an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China. The 10-item evaluation form is from three media experts. This section assesses media professionals' thoughts on a 5-point scale. The table below rates each criterion. Three media specialists analyzed the media quality assessment of information technology according to the ADDIE model, an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China application instruction to improve the learning accomplishment of Technical Vocational College students in Yunnan province, China. Overall, quality was outstanding(M = 4.50, SD = .58). According to the ADDIE model, learning by the intelligent education management encouraging creative habits for Grade 4 undergraduates application is exceptional when the computer application is straightforward to comprehend, utilize, and has precise details (M =4.85, SD. =.58).

Table 7: Compare students' achievements before and after learning through blended teaching online according to the intelligent education management on encouraging creative habits for Grade 4 undergraduates application.

Items	**n**	M	**SD**	***df***	**t-test**	**Sig. (2-tailed)**
Pretest	30	8.80	2.33	29	20.86	.05
Posttest	30	16.27	1.48			

**p< .05

Table 7 presents the learning achievement of intelligent education management in encouraging creative habits among Grade 4 undergraduates, according to the ADDIE model. Basic computer application teaching for enhanced learning achievement of Technical Vocational College students in Yunnan province, China. The mean pretest score was 8.80, and the standard deviation (SD) was 2.33. The result after using an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China application teaching constituted a substantial improvement in students, which translated into a high posttest of 16.27 and standard deviation (SD) of 14.8 and t-test analysis before and after the treatment of 20.86, which demonstrated a considerable difference was statistically significant at the .05 level.

Table 8: Examine students' satisfaction with an intelligent education management platform on encouraging the creative thinking habits of Grade 4 undergraduates in Yunnan Province, China.

Evaluation Items	**M**	**SD**	**Result Interpretation**
1. An intelligent education management platform on encouraging the creative thinking habits online blended Learning.	4.40	.51	Strongly Agree

2. Rich learning resources are available for an intelligent education management platform encouraging the creative thinking habits.	4.60	.50	Strongly Agree
3. Computer use benefits from an intelligent education management platform on encouraging the creative thinking habits application knowledge.	4.50	.51	Strongly Agree
4. The intelligent education management on an intelligent education management platform on encouraging the creative thinking habits application can collaborate and communicate.	4.37	.51	Agree
5. An intelligent education management platform on encouraging the creative thinking habits application allows for immediate feedback and Evaluation.	4.53	.51	Strongly Agree
6. Blended teaching online according to an intelligent education management platform on encouraging the creative thinking habits application can get multimedia teaching tools.	4.50	.51	Strongly Agree
7. Teaching blended teaching online according to the intelligent education management on encouraging creative habits for Grade 4 undergraduates application can have to learn management and tracking.	4.53	.51	Strongly Agree
8. According to the intelligent education management on encouraging creative habits for Grade 4 undergraduates application, blended teaching online can be an innovative teaching method.	4.67	.48	Strongly Agree
9. According to the intelligent education management on encouraging creative habits for Grade 4 undergraduates application, blended online teaching can be intercultural teaching.	4.41	.50	Agree
10. Blended teaching online, according to the intelligent education management on encouraging creative habits for Grade 4 undergraduates application, can be rethought and improved.	4.57	.50	Strongly Agree
Total	4.49	.50	**Strongly Agree**

Table 8: Shows the results of the Evaluation of students' satisfaction with blended online teaching, according to intelligent education management, for encouraging creative habits among 30 Grade 4 undergraduates. The overall student satisfaction was a strongly agreeing level (M =4.51, SD. = .50). When considering each item, it was found that blended teaching online according to an intelligent education management platform on encouraging the creative thinking habits application methods was strongly agreeing level (M = 4.67, SD= .48), and combined teaching online according to an intelligent education management platform on encouraging the creative thinking habits application was strongly agree level (M = 4.60, SD= .50), respectively. The students' satisfaction with the intelligent education management platform in encouraging creative thinking habits for Grade 4 undergraduates in Yunnan Province, China, received a high satisfaction level as a whole at an average of 4.49.

CONCLUSION

The analysis of the above information addresses the research objectives as follows: to study the efficiency of using blended online teaching, guided by intelligent education management, in encouraging creative habits among Grade 4 undergraduates. 1) Results of the evaluation of the efficiency of blended teaching online according to intelligent education management on encouraging creative habits for Grade 4 undergraduates. The mean score for the ongoing assessment was 81.40, and the mean score for the posttests was 81.23, indicating a substantial improvement in blended online teaching according to the intelligent education management to encourage creative habits among Grade 4 undergraduates in Yunnan Province, China. The result revealed that the value of efficiency of E_1/E_2 was 81.40/81.23. To summarize, this online Learning, based on blended teaching and intelligent educational management, is designed to encourage creative habits among Grade 4 undergraduates and is developed in accordance with the defined 80/80 standard criteria, 2) Results of Evaluation of the students' satisfaction with the intelligent education management platform in encouraging creative thinking habits for Grade 4 undergraduates in Yunnan Province, China, received a high satisfaction level as a whole at an average of 4.49.

DISCUSSION

The findings of this study directly address the research objective of examining the efficiency of blended online teaching guided by intelligent education management in encouraging creative habits among Grade 4 undergraduates in Yunnan Province, China. The results revealed that the instructional model achieved an efficiency value (E_1/E_2) of 81.40/81.23, which exceeded the established criterion of 80/80. This indicates that students demonstrated effective learning performance both during the instructional process and after completing the learning activities. The findings suggest that the integration of intelligent education management with blended online learning can effectively enhance students' learning achievement and support the development of creative habits.The success of the developed model may be explained by the characteristics of intelligent education management systems, which provide personalized learning pathways, real-time monitoring, and adaptive feedback mechanisms. These features align with the concept of intelligent learning environments proposed by Spector (2014), who argued that intelligent educational technologies can facilitate learner engagement, self-regulation, and higher-order thinking skills. Furthermore, the use of learning analytics within intelligent education management enables instructors to make data-driven decisions that improve instructional effectiveness and learner outcomes (Siemens & Long, 2011).The findings are also consistent with previous studies on blended learning. According to Graham (2013), blended learning combines the advantages of face-to-face instruction and online learning environments, resulting in greater flexibility, interaction, and learner autonomy. Similarly, Garrison and Vaughan (2008) emphasized that blended learning promotes meaningful learning experiences through the integration of collaborative activities, reflective practices, and technology-enhanced instruction. These elements contribute significantly to the development of creativity because students are encouraged to explore ideas, solve problems, and engage in collaborative knowledge construction. The results further demonstrated that students were highly satisfied with the intelligent education management platform, with an overall mean score of 4.49. This high level of satisfaction suggests that students perceived the platform as useful, accessible, and supportive of their learning needs. The finding supports the Technology Acceptance Model (TAM) developed by Davis (1989), which states that perceived usefulness and perceived ease of use are critical factors influencing users' acceptance of technology. When learners perceive educational technologies as beneficial and easy to use, they are more likely to engage actively in learning activities and achieve positive learning outcomes. Moreover, the high satisfaction scores may be attributed to the platform's ability to provide flexible learning opportunities, immediate feedback, and interactive learning experiences. These findings are consistent with research by Al-Fraihat et al. (2020), who found that system quality, information quality, and service quality significantly influence students' satisfaction and success in online learning environments. The intelligent education management platform used in this study appears to have successfully incorporated these qualities, thereby promoting positive learning experiences and encouraging creative thinking habits.In terms of creativity development, the findings support the view that technology-enhanced learning environments can foster creative habits by encouraging exploration, experimentation, and collaborative problem-solving. According to Beghetto and Kaufman (2014), creativity can be cultivated through learning environments that provide opportunities for inquiry, innovation, and reflective thinking. The blended learning activities implemented through the intelligent education management platform offered students opportunities to engage in such processes, thereby contributing to the enhancement of creative habits. Overall, the findings indicate that blended online teaching guided by intelligent education management is an effective approach for promoting creative habits among undergraduate students. The efficiency results exceeding the 80/80 criterion and the high level of student satisfaction demonstrate that the instructional model successfully supported both academic achievement and creativity development. These findings reinforce current educational trends emphasizing the integration of intelligent technologies, learning analytics, and student-centered pedagogies to enhance learning effectiveness and prepare students for the demands of the digital era.

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Model of Contextual Learning Media in Understanding the Knowledge and Skills of Learners

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ABSTRACT
The use of teaching methods in accounting education is still rare. This can lead to students having little or no interest, lack of motivation, and learning difficulties in understanding accounting because it is unclear. The importance of this research is to understand the production process of learning media models in accounting. Develop an understanding of knowledge and skills in accounting through learning experiences based on real-world situations. The method used in this study is the use of the research model (4D) developed by Thiagarajan, with definition (interpretation), design phase, development phase and dissemination phase (distribution). The results suggest that interpretation of existing data is not sufficient to support the use of the scientific method. All students are motivated to learn the curriculum in the classroom. The findings indicate that contextual learning media enhances student motivation and supports deeper conceptual understanding by linking accounting concepts to authentic situations and encouraging active participation and peer collaboration. The integration of contextual, active, and cooperative learning creates meaningful learning experiences that reduce abstraction, increase engagement, and foster practical competence in accounting education. This study contributes to the advancement of learner-centered instructional design and provides a pedagogical foundation for improving the relevance and effectiveness of accounting instruction.
Keywords: contextual learning, Cooperative Learning, Active Learning

Introduction

The educational process is an activity that teachers and students carry out in relationship within a subject to achieve results. During the education process, teachers must have many skills to manage the educational process. Education is a learning process designed by teachers to develop thinking. It can enhance students' thinking and ability to create new knowledge to enhance their knowledge of content. The purpose of education is to develop the ability to think and know the subject, where knowledge comes from outside the individual but is created individually by students. Abraham (2006)'s studies on Australian high school students show that the teaching style in accounting education affects students' learning. The results also show that high support of competence includes: simple explanations, understanding of students' needs, clear The aim is to reveal the relationship between teachers' teaching methods and the quality of teaching, with appropriate instructions. According to Abraham (2006), students are not interested in accounting because accounting concepts are not related to real life. According to Hudson's (2007) research among high school students in Central Java, many children still have problems writing money. This is evident from the average score of 4.49, while the required standard for education and skills is 7.00. These results show that performance is still below expectations. Internal factors such as health, academic satisfaction, academic motivation, and academic behavior have a 28.73% negative impact on high school students' financial situation. The lower the quality of the material in the middle, the more difficult it is for the student to learn; the lower the quality of the material in the body, the more difficult it is for the student.

Accounting education plays a strategic role in preparing learners to understand, manage, and make informed decisions related to financial activities in both personal and professional contexts. In an era characterized by rapid economic change, digital transformation, and increasing financial complexity, students are expected not only to master accounting concepts theoretically but also to apply them effectively in real-life situations. However, many accounting classrooms still rely on conventional instructional approaches that emphasize memorization, procedural drills, and textbook-centered learning. Such approaches often fail to address students' cognitive and motivational needs, resulting in low engagement and superficial understanding. One of the persistent challenges in accounting education is the abstract nature of the subject matter. Accounting concepts are frequently presented in symbolic forms, numerical representations, and standardized procedures that appear disconnected from students' daily experiences. When learning content is detached from real-world contexts, students may struggle to perceive its relevance and usefulness. This lack of contextualization often leads to decreased motivation, learning anxiety, and difficulty in transferring knowledge to practical situations.

Consequently, learners may develop negative attitudes toward accounting, viewing it as a rigid and complex subject rather than a meaningful and applicable discipline.Educational research increasingly emphasizes the importance of learner-centered approaches that actively involve students in the learning process. Active learning and cooperative learning models have been widely recognized as effective strategies for enhancing student engagement, critical thinking, and conceptual understanding. These approaches encourage students to participate in discussions, collaborate with peers, and engage in problem-solving activities that promote deeper cognitive processing. When students are actively involved in constructing knowledge, learning becomes more meaningful and enduring.

In addition to active participation, contextual learning has emerged as a powerful framework for bridging the gap between academic content and real-life application. Contextual Teaching and Learning (CTL) emphasizes the integration of subject matter with authentic situations that learners are likely to encounter outside the classroom. By connecting accounting concepts to real financial documents, business transactions, and everyday economic activities, contextual learning enables students to develop a clearer and more practical understanding of the subject. This approach aligns with constructivist learning theory, which views knowledge as something learners actively construct based on prior experiences and social interaction.Despite the recognized benefits of contextual, active, and cooperative learning, their application in accounting education remains limited, particularly at the secondary school level. Many classrooms continue to rely on static instructional materials that do not adequately support experiential learning or student collaboration. As a result, there is a pressing need to develop innovative learning media that can support these pedagogical approaches while remaining aligned with curriculum standards and learner characteristics. This study responds to that need by developing a contextual learning media model designed to enhance students' understanding of accounting knowledge and skills. Through the integration of index card matching and collaborative worksheets based on real-world financial contexts, the study seeks to create meaningful learning experiences that promote motivation, conceptual understanding, and practical competence. By addressing both cognitive and affective dimensions of learning, this research contributes to the ongoing effort to improve the quality and relevance of accounting education.

Literature Review

Active Learning

Therefore, the fundamental and important problem to be solved is the need to create a model of educational and training materials that stimulate interest, the ability to motivate and study, and the ability to overcome, whether based on content or real-life facts. Financial difficulties in education. The specific goal to be achieved in response to the basic problem is to create a learning model that can increase interest, keep track of the situation, increase motivation and study habits, and overcome the difficulties of learning accounting education. Therefore, examining this developmental model is important to create the student's learning that stimulates interest, whether situational or real-life based, to create the ability to do in order to have motivation and learning attitude, and to overcome difficulties in the learning process. I'm studying accounting. By creating experiences based on real-world situations, you can improve not only your knowledge but also your financial knowledge. Therefore, the focus of the study is on students not only understanding economic research but also applying economic methods as they are needed in the real business world.

An innovative way to create a learning model is to create a competitive curriculum that is relevant to real life and integrate it with worksheets related to accounting topics. The Consolidated Index Cards to Match Workbook is a set of index cards that use examples of business documents commonly used in the financial world, such as credit/debit statements, invoices, receipts, bill endorsements, checks, and other items used by accounting. worksheet. . Therefore, students can learn how to meet and think about their own financial affairs as they do in the real world through this innovation. Financial education is used by completing the worksheets comparison card together. Therefore, the purpose of this innovation is to match and integrate content index cards with financial statements. By creating a checklist appropriate to the content and general study of accounting, it is possible to contribute to the development of human resources in Indonesia through the development of good education, that is, not only understanding the theory but also being able to apply it. He is in the accounting field. Not just information, but information that affects real life. As a result, more and more people in this country are able to manage their money effectively. Active learning is a way of learning that enables more students to obtain more knowledge and experience, to discuss and learn during the course, thus gaining knowledge that can improve their abilities (Morable, 2000). Additionally, active learning allows students to improve their skills and communication and derive new conclusions from the results of their own analysis. Active learning means active learning. Experts and observers often call this learning by modeling. His approach views learning as a process of creating understanding through knowledge and information (Horton, 2002). Thanks to this approach, the student's unique understanding of knowledge and thinking affects the learning process. Active learning learning model is a teaching model that aims to improve the quality of learning by supporting the learner in the learning

process. Active learning is a learning process that aims to make students use different methods or strategies to learn (Silberman, 2001). Research shows that active learning is an effective method. Dale's (1969) research also shows that learning is weak and often leads to permanence of knowledge. In this case, the active learning process is when students use their brains to come up with ideas, solve the problems being studied, and prepare for mental and physical exercises. Silberman (2001) also says the same thing: He believes that to learn effectively, students must use their brains through learning strategies, problem solving, and using skills, and that learning often requires having a free heart, acting, and thinking. Difficult (Move and think out loud).

How can we encourage students using the disciplinary methods that teachers (teachers) use in their teaching work? Teaching through lectures is not only stressful but also makes students depressed for long periods of time; Students can remember 70% of the content in the first 10 minutes and only 20% in the last 10 minutes. This truth is equivalent to the pearl given by the Chinese poet Confucius. Who said, "I forget what I hear, I remember and understand what I see. For the active learning process to always work, teachers must use and manage active learning strategies. Critical learning strategies are necessary because each student learns differently. And teachers must be active to assist or improve education." It is important that they use learning strategies how often a person learns, even if the level of work is different. As noted above, these activities can take many forms. But all this must go back to the nature of the initiative, that is, active learning itself embodies knowledge and thinking in teaching and learning, and behind this is the connection of knowledge transfer between knowledge, action and direct knowledge. (Feedback) In the creation and satisfaction and internalization of knowledge, in the creation of value and character.

Cooperative Learning

According to Hudson (2007), a learning model is instruction in the form of a process or teaching strategy designed to achieve learning goals. This guide includes the responsibilities of teachers in planning, implementing and evaluating education. One of the purposes of using this type of learning is to develop students' abilities while learning. With the selection of methods, methods, strategies and learning skills, the transition from rote learning to thinking and understanding, the transition from academic discipline to learning or pursuing learning problems, and the transition from individual learning to collaborative learning are observed. . Student-centered or embedded student knowledge. The collaborative learning model is nothing new for teachers. What is the collaborative learning model? Cooperative learning model is a learning model that emphasizes teamwork. Each student in the group has a different ability (high, medium or low) (Jones, 2008). Collaborative learning models emphasize collaborative problem solving and the use of knowledge and skills to achieve learning goals.

Jones (2008) believes that collaboration is a learning method that results in best learning through a group of students working together to achieve learning goals. Participatory learning is learning that is intentional and creates relationships, interests and relationships. Meanwhile, Bruner explains in Silberman (2001) that collaborative inquiry, responding to others in achieving goals, is an important human need. According to Rohrer (2010), all learning models are characterized by work, goal models and reward models. The working structure, goals and reward structure of cooperative learning models are different from other learning models. In the learning process of the cooperative learning model, students are expected to complete a task together and they must work together to complete the task taught by the teacher.

The Research Focus

During financial research during high school senior year, only the book package is used. This will obviously cause students to be less interested in learning accounting, less motivated, and more difficult to study for. High school accounting textbooks do not provide examples of real-life accounting practices. The budget includes summary calculations only and contains questions that only refer to proof of work but do not describe proof of work. In other words, the student does not know the certificate but the physical form of the transaction. Therefore, research in this development model focuses on the creation of teaching materials and case studies that can create learning knowledge for students, thus being situational or real-life based, adequately stimulating and making students interested in learning. Accounting work is difficult to handle. By creating experiences based on real-world situations, you can improve not only your knowledge but also your financial knowledge. Therefore, the focus of the study is on students not only understanding economic research but also applying economic methods as they are needed in the real business world.

Methodology

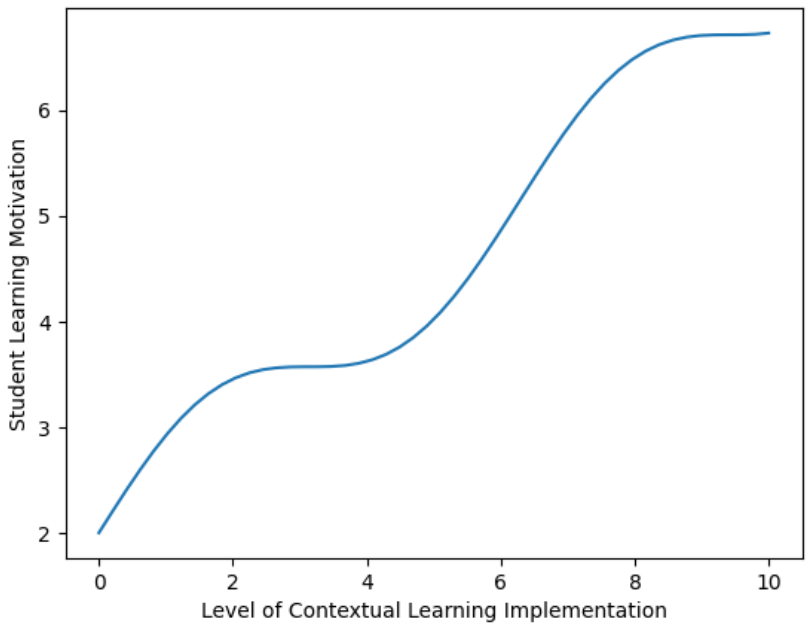
Developmental models can be structural models, conceptual models, and theoretical models. A process model is a descriptive model that describes the steps to be followed in the production process. The implementation of this development model is the product of index cards and collaborative worksheets. The development model used is

based on Thiagarajan's development model, which is a 4-dimensional development model that covers content, design, development and promotion. Description level (Define), the purpose of the definition level is to define and describe the content of the study. In this stage, the researcher will examine the necessary requirements in the card list comparing the worksheet for the integration of the content before creating the information. The main steps in the development of educational tools in this decision-making stage are: Review of educational materials that should be considered in the development of necessary materials. In this development, the East Java high school science curriculum was used. B. Student Profile Analysis, Student profile is done at the beginning, integrated worksheets based on content and index card comparative design in order to understand the characteristics of students. Student characteristics include academic ability, age and maturity, and student experience.

Based on these features, we hope to create a unified and integrated content as curriculum for students. The topics tested in the index card comparison are the content and the entire text. C. Role analysis and analyzes work here to prepare the financial information of the capital in the company's business and send it through the report. Functional analysis was carried out by expanding the content of the material in the data obtained from sources in the company's financial cycle. D. Content analysis is the process of gathering and distributing information about the data created by determining the key themes to be created. The content of the information produced is in accordance with the curriculum that addresses the learning objectives. This design is intended for student publications in the form of subject indexes and comparison cards, as well as functional maps of business resources of business companies. Development phase (Private) where the researcher receives advice from experts/experts in the field of graphic design and education. The purpose of this step is to research and verify content and integrate learning tools and printables in the form of card comparison worksheets. At this stage, arrangements will be made in line with the suggestions/opinions of experts. At this stage, the results of the printed material were presented in the form of a content evaluation report and a general report of the workshop held with East Java high schools.

Results and Discussion

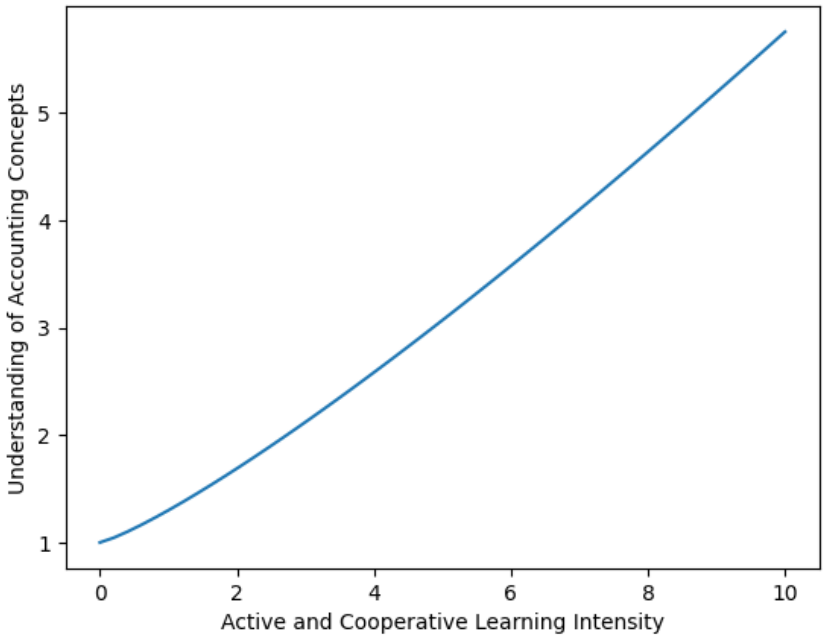
The presentation of research and development results aims to answer the above questions. The information to be presented is the result of the competition of the printed information competition card designed to contextualize and complement the work of the accounting cycle of the high school trading company. Development based on Thiagarajan's development model 4D (Four Dimensional Model) which includes content, design, development and advertising. However, due to the limitations of the researchers, this research is still in the development phase. The development of the general report card and the corresponding content of the meaning of the business cycle in high school are as follows: At this stage, the researcher has identified and defined the following terms: Education. The researcher conducts the necessary needs analysis before creating the printed data comparison card according to the research method. This interpretation phase consists of five important steps such as preliminary analysis, student analysis, task analysis, strategy analysis and goal formulation.



Curve 1: Relationship between Contextual Learning Implementation and Student Motivation

The first curve illustrates a clear and progressive relationship between the level of contextual learning implementation and student learning motivation in accounting education. At the initial stage, where contextual learning is minimally applied, student motivation appears relatively low. This condition reflects common classroom realities in which accounting is taught through abstract explanations and textbook-based exercises, making it difficult for students to perceive the relevance of the subject to real-life situations. As a result, students often demonstrate limited interest, passive engagement, and low emotional involvement in the learning process. As the implementation of contextual learning begins to increase, the curve shows a gradual rise in student motivation. This phase represents a transition period in which learners are introduced to real-world elements, such as authentic financial documents and situational case studies. Even limited exposure to contextual learning enables students to recognize the practical value of accounting knowledge. This recognition plays a crucial role in stimulating intrinsic motivation, as students begin to understand that accounting is not merely a theoretical subject but a tool for interpreting and managing real financial activities. The curve then demonstrates a more pronounced increase in motivation as contextual learning strategies are consistently and systematically integrated into classroom instruction. At this stage, learning activities are designed to actively involve students in problem-solving, analysis, and decision-making processes that mirror real accounting practices. The use of index card matching, collaborative worksheets, and scenario-based tasks enhances student autonomy and engagement. This aligns with motivational theories that emphasize relevance, competence, and meaningful participation as key drivers of sustained learning motivation.

Furthermore, the upward trend of the curve indicates that contextual learning not only attracts initial interest but also supports long-term motivational development. Students who experience learning environments that connect academic content with real-life contexts are more likely to persist in learning, even when faced with complex or challenging material. In accounting education, where concepts often require sequential understanding and procedural accuracy, sustained motivation is essential. Contextual learning reduces anxiety and cognitive overload by presenting content in familiar and understandable forms. Another important implication of the curve is its reflection of the teacher's role in shaping student motivation. As contextual learning implementation increases, teachers shift from being knowledge transmitters to facilitators of learning experiences. This instructional shift fosters a supportive learning climate in which students feel encouraged to ask questions, express ideas, and collaborate with peers. Such an environment enhances students' sense of belonging and confidence, which further contributes to higher motivational levels. In summary, Curve 1 provides empirical and conceptual support for the argument that contextual learning implementation positively influences student motivation in accounting education. The progressive nature of the curve suggests that motivation develops as a result of continuous and meaningful exposure to contextual learning experiences. By integrating real-world relevance into instructional design, educators can transform accounting learning from a passive and abstract process into an engaging and motivating educational experience.



Curve 2: Growth of Accounting Understanding through Active and Cooperative Learning

Curve 2 illustrates the progressive growth of students' understanding of accounting concepts as the intensity of active and cooperative learning increases. At the initial level, where active engagement and collaboration are limited, students' conceptual understanding remains relatively low. This condition is typical of learning environments dominated by lecture-based instruction, where students are passive recipients of information. In such contexts, learners may be able to recall definitions or procedures, but they often struggle to grasp underlying concepts or apply accounting principles in unfamiliar situations. As active and cooperative learning strategies begin to be introduced, the curve shows a steady upward trend in conceptual understanding. This phase represents a shift from passive learning toward participatory learning, where students are encouraged to discuss, analyze, and solve accounting problems together. Through group discussions and collaborative tasks, learners are exposed to multiple perspectives and reasoning processes. These interactions help students clarify misconceptions, refine their thinking, and construct a more coherent understanding of accounting concepts. The curve further demonstrates that deeper understanding develops when active and cooperative learning is implemented consistently and with greater intensity.

At this stage, students engage in hands-on activities that simulate real accounting processes, such as analyzing transactions, matching financial documents, and completing accounting cycles collaboratively. Such activities require learners to integrate knowledge, apply logical reasoning, and make informed decisions. As a result, learning moves beyond surface-level comprehension toward higher-order cognitive processing. Another important interpretation of Curve 2 is that cooperative learning enhances cognitive development through social interaction. When students explain concepts to peers, ask questions, and negotiate meaning, they engage in metacognitive processes that strengthen understanding. Peer-to-peer interaction allows students to externalize their thinking, receive immediate feedback, and adjust their mental models accordingly. This aligns with constructivist learning theory, which emphasizes that knowledge is constructed through interaction with both content and social environments. The increasing slope of the curve also suggests that active and cooperative learning supports the transfer of knowledge to new contexts. Students who actively engage with accounting concepts are more likely to apply what they have learned to real-life financial situations. This ability to transfer knowledge is particularly important in accounting education, where practical competence is a key learning outcome. By working collaboratively on authentic tasks, students develop not only conceptual understanding but also problem-solving skills relevant to real-world applications. In conclusion, Curve 2 highlights the critical role of active and cooperative learning in fostering meaningful understanding of accounting concepts. The gradual yet accelerating growth depicted in the curve indicates that conceptual understanding develops through sustained engagement and collaborative learning experiences. This finding supports the integration of active and cooperative strategies within contextual learning media, as they enable students to construct knowledge more deeply and effectively than traditional instructional approaches. Teachers who still use a behavioral framework often organize the curriculum by organizing content into chunks marked by specific skills. Then create pieces from simple to complex. Behavioral theory theories have long been used by educators. The theory has often been criticized for not taking into account the complexity of learning, because there are many different factors or factors that affect learning, and learning can be done as support and relationship. This hypothesis cannot explain the differences that occur in relationship-response. Behaviorist theories also tend to lead students towards a theory that is inclusive rather than rational and inefficient. The perspective of this theory is that education is a design or planning process that directs learners to achieve certain goals, preventing students from creating and thinking freely. Although there are many factors that affect the learning process, the learning process is more than design or creation. This process shows the formation of behavior that occurs as a result of learning. Behaviorist theory states that the stimulus-response model attempts to treat learners as passive individuals. The practice or solitude used to engage in a particular response or behavior.

If reinforcement is given, the behavior occurs more frequently; if punishment is given, the behavior disappears. The use of behaviorism in education depends on many factors such as the learning goal, nature of the content, characteristics of the learner, availability of media and the learning environment. Behaviorism theory believes that knowledge is objective, stable, fixed and unchangeable. Intelligence was developed so that learning is the acquisition of knowledge and teaching is the transfer of knowledge to the learner or student. The function of the mind or intellect is to create patterns of existing knowledge through thought processes that can be analyzed and organized, so that the meaning created by these thought processes is determined by the characteristics of the knowledge structure. Students must have a common understanding of what is being taught. That is, how does the teacher understand, how should the teacher understand, how should the learner understand ?. Likewise, in education, students are seen as weak objects and always need encouragement and support from their teachers. Therefore, teachers use some standards in the educational process to create classes that students can follow. Likewise, during the evaluation, the student's education is measured only by what is seen and seen, so what is not observed during the evaluation is left untouched.

The importance of behavioral theory in education is evaluated as less freedom to create, test and develop students' abilities. Students are seen as robots who merely follow the teacher's instructions. For this reason, students cannot develop according to their current abilities. Since behavioral behavior retains knowledge well and is judged, the learner or learner must first become acquainted with strict rules. Attitudes and discipline play an important role in education, so further education is linked to the management of discipline. Failure to increase or achieve knowledge is considered a mistake, and success in learning or ability is classified as the outcome of the behavior. Complying with the requirements is seen as a determinant of academic success. Students are rule-abiding subjects, so the management of education must be done through external methods. Education is strictly based on sequential courses, with many courses based on textbooks/required books, focusing on skills that present the content of the books/book. The purpose of education is to help students become independent, independent individuals who can contribute to society. Education makes people manageable but uncontrollable. Education is not just about practicing or teaching what is taught, it also creates itself. The adoption of constructivism in the teaching process has led to the emergence of a teaching method that focuses on student activities. Learning theories based on constructivism view the learner as someone who responds to and perceives the complexity of objects and situations in his or her environment. According to this theory, it is important to know that the main source of the information in research is students. They organize and create knowledge through experiences that create knowledge. They have to go through experiences that ultimately lead to the understanding of some knowledge. Constructivist theory emphasizes the importance of students knowing the reasons and purposes of what they learn. It is important for him to not receive an education that produces people who only obey and carry out orders. A teacher is someone who teaches, models and teaches students to be independent and play a role in improving people's lives. If there is reward and punishment, then "reward and punishment must be the result or outcome of every task and environment. Teaching is not the act of imparting knowledge from the teacher to the student, but the act of allowing the students to create." learning, creating knowledge, making meaning, seeking clarity, prioritizing, and decision making. Teaching is helping students think about thoughts, actions, and ideas by allowing them to think on their own.

Teachers should understand and appreciate the ideas of students who often express different ideas, even the opposite of their own. Then what the students say in response to the question helps them understand. If the answers do not fit the principles of the research or the problems, the teacher should be careful about teaching. Do not allow guidance to satisfy students' curiosity or cause conflict between teacher and students. Education is the teacher's desire to help students or students learn according to their needs and interests. Education is a very important part or foundation in the educational process and in achieving the (successful) results of a good education. Education is also affected, resulting in poor learning. This means that learning depends on the teacher's ability to implement or package the learning process. Effective and correct education will bring good results to students, on the contrary, poor education will make it difficult for students to develop or advance their abilities. According to research, there are three education models today that are often confused with the concept of "teaching". First of all, teaching is about developing knowledge for students to enable them to acquire as much knowledge as possible. Type 1 teaching is considered successful if the student completes as much as possible according to the ability of the teacher. Second, teaching is about transmitting culture to students. The second definition is essentially the same as the first; It refers to the teacher as an active being. Third, teaching is an activity that connects with the learner and organizes or controls the environment as much as possible for the learning process to occur.

The first and second definitions are widely used in most communities. As a result, students master the content but do not know how to use and develop it. They are like a boy whose parents give him food to drink, but he does not know where the food comes from, how he makes it, or how he gets it. At the same time, the meaning of the model we teach is now widely used today, especially in community schools. As a result, students not only know the curriculum, but also know its foundation and how to acquire and develop it. In this world age where it is imperative to raise creative, innovative, dynamic and independent graduates, a third education model needs to be known. Using the third theory, not only teaching leads to intellectual knowledge, but also learning leads to scientific knowledge, intelligence, character and other developments. In this way, learning itself takes place. According to the above research, the use of real learning time should guide the learner and create an environment conducive to the learning process. Situated learning theory is heavily influenced by constructivist ideas. An important concept of the construct is adjacent cognition (embedded cognition). This idea refers to the idea that thoughts are not always located or isolated in the person's head but in the social and physical environment. Knowledge is linked to the content that knowledge develops. Home education has been developed under different names in developing countries. Called CTL (Contextual Teaching and Learning) in the United States, the main purpose of this program is to help teachers connect the curriculum to real life and encourage students to relate what they are learning to their daily lives. The result of an educational environment supported

by poor graduates or learning outcomes; This means that most students cannot truly relate the curriculum to real life. Today's education is like a divorce from a relationship, so many problems that arise are not resolved at the intersection. Therefore, it is necessary to examine the connection between teaching materials and the real world of students using CTL learning theory (Contextualized Teaching and Learning). Learning in a learning environment is not memorization, but the process of creating knowledge based on the knowledge the learner has. Therefore, the more information you have, the more knowledge you will get. Cognitive ability must be related to behavioral patterns such as thinking, action patterns, and problem solving. Therefore, in this study, we direct students to the problem solving process. Therefore, problem-solving skills will help students develop their intellectual and psychological skills. Situated learning is learning how students can solve problems. Learning is a process of self-awareness that gradually develops from simple to complex. Therefore, education at school has an important role in teaching students about life.

Especially in high schools, preliminary evaluation is made by analyzing the results obtained on the site. The researcher found some results as most of the students found and encountered problems while studying the businesses of companies. There is also less understanding among students because teaching materials are inadequate, meaning that the information presented in the existing literature is brief and there is little support for the use of scientific methods in the use of the curriculum. At the same time, according to students' feedback, other teaching materials should also be used to understand the thematic maps. However, students are less active in research activities and other issues (such as the Internet). Occurring events are events that affect the use of classes that work less than the maximum time. Based on the results and the questions raised, have the researchers considered creating a study based on card comparison of published data?. Student profiles are created by researchers by analyzing student characteristics such as academic ability, age, academic motivation and student characteristics. The data published based on the research was tested with secondary school students with an average age of 17. In general, middle school students are eager to learn what they learned in the classroom. Cognitive development continues in high school (adolescence). Transfer of knowledge in high school leads to increased talent. Sometimes some skills don't develop with age. High school age teens who are searching and trying to figure themselves out think a lot about this. They still don't really understand the social norms that apply to life. It leads to social problems because both have difficulty accepting homosexuality within a group or society. The struggles and insecurities in a relationship can be detrimental to both partners. For this reason, young people's relationships between the family environment, school and community environment need to be established.

During the high school period, there are general changes in young people, that is, efforts based on emotional, physical and mental changes, changes in the body, changes in preferences and responsibilities have to be carried out by certain social groups, which leads to problems, interests, problems, changes in attitudes and values are not sufficient . These changes ultimately affect their physical, cognitive, emotional and psychomotor development. The only thing teachers can do for young people who daydream frequently and have difficulty controlling their thoughts is to treat students as if they were adults' responsibilities. One important way is to encourage them to compete with themselves. It should be noted that teenagers in high school age are in a confusing state and difficult to guess their behavior. In many ways, he relies on parents on physical needs and feels obligated to the care they provide when he is unable to take care of himself. However, he also felt that he wanted to be free from the authority of his parents to become an independent adult. It triggers happen. The findings of this study reinforce the growing consensus in educational research that learning effectiveness, particularly in accounting education, is strongly influenced by the alignment between instructional strategies and learners' real-world experiences. The development of contextual learning media through index card matching and integrated worksheets offers a pedagogical response to the long-standing challenge of abstractness in accounting instruction. Accounting, by nature, involves symbolic representations, procedural rules, and technical terminology that often remain disconnected from students' everyday experiences. As a result, students frequently perceive accounting as difficult, monotonous, and irrelevant, leading to low motivation and superficial understanding. The discussion below elaborates on how the contextual learning model developed in this study addresses these challenges from theoretical, pedagogical, and practical perspectives.

From a constructivist standpoint, the learning media developed in this research aligns with the principle that knowledge is actively constructed by learners rather than passively received from teachers. Traditional accounting instruction, which relies heavily on lectures and textbook-based problem solving, reflects behaviorist assumptions where learning is seen as the accumulation of correct responses to given stimuli. While such approaches may support short-term memorization, they often fail to foster conceptual understanding and transferability of knowledge. In contrast, the contextual learning media introduced in this study encourages students to engage with accounting concepts through authentic representations of financial documents, such as invoices, receipts, and transaction records. This experiential engagement allows learners to build mental

connections between theoretical concepts and practical applications, thereby deepening their understanding. The use of index card matching activities is particularly significant in promoting active learning. Active learning theory emphasizes that students learn more effectively when they are cognitively, emotionally, and socially involved in the learning process. Through card matching, students are required to analyze information, identify relationships between concepts, and make decisions collaboratively. This process shifts the focus of learning from content delivery to meaning construction. Rather than merely memorizing accounting procedures, students actively reconstruct accounting cycles by linking transactions to corresponding financial records.

This aligns with Silberman's (2001) assertion that learning by doing enhances retention and comprehension, especially in complex subject areas such as accounting. Moreover, the integration of cooperative learning within the contextual learning media further strengthens its pedagogical value. Cooperative learning is grounded in the idea that knowledge construction is a social process. When students work in groups, they are exposed to diverse perspectives, problem-solving strategies, and reasoning processes. The findings of this study suggest that cooperative engagement through card-based worksheets not only increases student participation but also improves communication skills and collective responsibility for learning outcomes. This is consistent with Jones' (2008) view that cooperative learning promotes higher-order thinking by requiring learners to articulate their understanding and negotiate meaning with peers. Another important aspect highlighted by this study is the role of motivation in learning accounting. Motivation is a critical determinant of learning success, particularly in subjects perceived as difficult or abstract. The results indicate that students demonstrated higher levels of motivation when learning materials were contextualized and presented in an interactive format. Contextual learning media reduces cognitive overload by situating new information within familiar contexts, making learning more accessible and meaningful. When students recognize the relevance of accounting concepts to real-life situations, such as managing personal finances or understanding business transactions, their intrinsic motivation increases. This supports Abraham's (2006) findings that student interest in accounting improves when instructional content is connected to real-world applications. The discussion also underscores the limitations of textbook-centered instruction in accounting education. Textbooks often present accounting concepts in a linear and decontextualized manner, emphasizing procedural accuracy over conceptual understanding. While textbooks remain an important reference, their exclusive use may hinder students' ability to visualize and internalize accounting processes. The contextual learning media developed in this study complements textbooks by providing tangible representations of accounting practices. By interacting with simulated financial documents, students gain a more holistic understanding of how accounting functions in real organizational settings.

This experiential dimension is essential for bridging the gap between theory and practice. In terms of curriculum implementation, the contextual learning media aligns well with competency-based education and scientific approaches promoted in contemporary curricula. Modern educational frameworks emphasize not only cognitive outcomes but also the development of skills, attitudes, and values. The learning model discussed in this study supports these objectives by fostering analytical thinking, collaboration, and problem-solving skills. Students are encouraged to observe, question, analyze, and reflect—processes that are central to scientific learning approaches. As a result, learning becomes a dynamic process of inquiry rather than a static transmission of knowledge. The developmental approach adopted in this research, based on Thiagarajan's 4D model, also contributes to the robustness of the learning media. The define and design stages ensure that the media is grounded in curriculum requirements and learner characteristics. Although the current study is limited to the development phase, the discussion highlights the potential impact of further stages, particularly dissemination and effectiveness testing. Future implementation across diverse educational contexts could provide empirical evidence on learning outcomes, retention rates, and skill acquisition. Such studies would strengthen the argument for integrating contextual learning media into mainstream accounting education. Another noteworthy implication of this study relates to learner diversity. High school students vary widely in terms of cognitive ability, learning styles, and prior knowledge. Contextual and cooperative learning approaches are particularly effective in addressing this diversity because they allow multiple entry points to learning.

Visual learners benefit from concrete representations of financial documents, while social learners thrive in collaborative settings. At the same time, students with lower academic confidence can learn from peers through shared problem-solving activities. This inclusive nature of contextual learning media supports equitable learning opportunities for all students. The discussion also points to the broader role of teachers in facilitating contextual learning. Teachers are no longer mere transmitters of knowledge but designers of learning environments. Implementing contextual learning media requires teachers to adopt flexible instructional roles, such as facilitators, mentors, and observers. Teachers must guide discussions, provide scaffolding when needed, and encourage reflection. This shift in role may present challenges, particularly for educators accustomed to traditional teaching methods. However, professional development and institutional support can help teachers

transition toward more learner-centered pedagogies. Despite its strengths, the contextual learning model presented in this study also faces certain limitations. The development phase has not yet been followed by rigorous experimental testing to measure learning effectiveness quantitatively. As such, conclusions regarding learning gains are primarily based on qualitative observations and motivational indicators. Additionally, the successful implementation of contextual learning media depends on classroom conditions, including time availability, class size, and resource support. These factors should be carefully considered in future research and practice. In conclusion, the discussion affirms that contextual learning media grounded in active and cooperative learning principles offers a promising approach to improving accounting education. By connecting accounting concepts to real-life contexts, engaging students actively, and promoting collaborative learning, the model addresses both cognitive and affective dimensions of learning. While further research is needed to evaluate its effectiveness empirically, the findings provide a strong theoretical and pedagogical foundation for the integration of contextual learning media in accounting classrooms. Ultimately, such approaches contribute to the development of learners who not only understand accounting concepts but are also capable of applying them meaningfully in real-world situations.

Conclusion

The result of the research shows that the definition of teaching materials is insufficient in supporting the application of scientific approach in implementing Curriculum. Overall students have good learning motivation to the material learned in the classroom. In the design phase, the draft index card match is integrated into the printed worksheet. Further research is needed to determine the effectiveness of printed materials of Card Match index through the review of material experts, at develop and disseminate stages to gain confidence in the effectiveness of teaching materials. Advanced research is needed to determine the effectiveness of printed materials of Card Match index through the class. This study highlights the importance of contextual learning media in enhancing students' motivation and understanding of accounting knowledge and skills. By integrating real-world financial contexts with active and cooperative learning strategies, the proposed learning model addresses key challenges commonly found in traditional accounting instruction. The findings suggest that when accounting concepts are presented through meaningful and authentic learning experiences, students are more motivated, engaged, and capable of constructing deeper conceptual understanding. The development of contextual learning media using index card matching and collaborative worksheets demonstrates that learning is most effective when students are actively involved in the learning process. Active participation and collaboration encourage learners to analyze information, exchange ideas, and apply accounting concepts in practical situations. This approach not only improves cognitive outcomes but also fosters essential soft skills such as communication, teamwork, and problem-solving, which are increasingly important in today's dynamic economic environment. Furthermore, the study underscores the role of teachers as facilitators of learning rather than mere transmitters of knowledge. Implementing contextual, active, and cooperative learning requires educators to design learning environments that support exploration, interaction, and reflection. Although the current research is limited to the development stage, it provides a strong theoretical and pedagogical foundation for further implementation and evaluation. Future research is needed to examine the effectiveness of the learning media through experimental studies and broader classroom applications. In conclusion, contextual learning media offers a promising alternative for improving the quality and relevance of accounting education. By bridging the gap between theory and practice, this approach helps students develop meaningful knowledge that can be applied beyond the classroom. The integration of contextual, active, and cooperative learning strategies contributes to the development of learners who are not only academically competent but also motivated and prepared to face real-world financial challenges.

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Technology of Using Computer Models in Teaching Physics Course in Secondary School

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Abstract
One of the main directions of education in modern times is the application of information and communication technologies (ICT) in the teaching process. In teaching physics, these technologies, especially computer models, virtual laboratories, make the learning process more interesting, visual and interactive for both the teacher and the student.
The article examines the essence and methodological possibilities of using computer models in order to increase the efficiency of the teaching process in the physics course of secondary school. In the context of the rapid growth of information, the role of interactive models, virtual demonstrations and experiments (simulations) in the development of students' scientific and cognitive skills is emphasized. The visual presentation of physical phenomena and processes through computer models allows students to be involved in independent research activities.
Since natural sciences, especially physics, are based on experiments and observations, the use of computer models and virtual laboratories in teaching its subjects is of great importance.
In teaching the VII-IX grade physics course, the use of computer models is very effective in helping students to deeply understand the essence of physical phenomena, learn their practical application, and form independent research skills. Computer models play an important role in explaining physical phenomena and processes. In addition to replacing real demonstrations and experiments, they create the following opportunities for students:
- Conducting demonstrations and experiments safely and repeatedly;
- Observing the results of events and experiments by changing parameters;
- Analyzing the results in the form of graphs, tables, and animations.

The mentioned features make the teaching of physics interactive and interesting. In teaching physics, it can be difficult or expensive to demonstrate many events and processes in real conditions. In this regard, computer models are considered indispensable.
Keywords: physics, computer, model, demonstration, virtual experience, practical work, technology.

Introduction

In modern education systems, the integration of information and communication technologies (ICT) has significantly enhanced the quality of the teaching and learning process. One of the primary tasks emerging from scientific and technological progress is the effective use of ICT in education.

Educational reforms implemented in the Republic of Azerbaijan continue systematically and strategically. These reforms create a foundation for enriching and modernizing the educational environment both in terms of content and material–technical infrastructure (Ministry of Education of the Republic of Azerbaijan [MoE], 2022).

In physics education, the use of modern ICT tools enables students to acquire knowledge and develop skills more effectively. Teaching physics today is not limited to knowledge transmission; it also aims to enhance students' cognitive activity and develop critical and creative thinking skills. Therefore, interactive teaching methods and digital technologies are particularly important.

Aim of the Study

Teacher professionalism and pedagogical competence play a decisive role in optimizing physics instruction. Teachers possessing both pedagogical and technological knowledge significantly improve instructional effectiveness and promote deeper student understanding.

The integration of modern technologies in physics teaching strengthens practical orientation and enhances student engagement (Hestenes, 2010). Thus, examining the theoretical and methodological foundations of technology integration in physics education is an important pedagogical direction.

Significance

Virtual laboratories, simulations, interactive whiteboards, and digital platforms enhance instructional content and facilitate understanding of abstract physical phenomena through visual models (Hestenes, 2010).
However, challenges remain, including:

- Insufficient technological infrastructure in some schools,
- Limited ICT competencies among teachers,
- Unequal distribution of digital educational resources.
- Addressing these issues requires continuous professional development programs, adaptation of digital tools to the national educational context, and development of localized digital resources.

Theoretical Framework

Computer models - provide a demonstration of physical processes or phenomena using computer programs. These models are used to conduct experimental demonstrations and experiments and to understand complex phenomena (Hestenes. 2010, Mammadov. 2021, Aghayev. 2015).

These models help students understand complex concepts and learn physical concepts and quantities safely instead of real experiments.

In the process of teaching physics in secondary school, computer models are used for the following purposes:
1. To clarify abstract concepts;
For example, concepts such as “Electric charge” and “Interaction of charges – Coulomb's law” can be explained with visual animations and graphics (Physics animation/Simulation. 2025.
https://www.vascak.cz/physicsanimations.php?l=ru).
2. To perform dangerous and costly demonstrations and experiments;
It is possible to safely simulate dangerous demonstrations such as electrical circuits, chemical and nuclear reactions, etc. on a computer.
3. To repeat experiments in laboratory work;
In virtual laboratory work, students can check individual parameters and compare results.
4. To simplify complex processes;
For example, topics such as “Laws of motion”, “Wave motion”, etc. can be presented in different scenarios (Physics animation/Simulation 2025. https://www.vascak.cz/physicsanimations.php?l=ru).

Literature Review

Literature has been published in various languages on the use of modern technologies in teaching physics. Since these literatures are written in different languages, students and pupils have difficulty using them. For example, the work “Teaching Informatics and the Application of ICT” (Huseynov, 2006) provides a general methodological approach to information technologies in teaching physics. The work “Innovative Technologies in Teaching Physics” (Aghayev, 2015) presents local examples of the application of computer simulations and virtual laboratories in physics lessons (Mammadov, 2021).

However, there are very few materials on the technology of using computer models in teaching physics in general secondary and high schools. For this purpose, I have published articles on the technology of using computer models in teaching physics (Hajiyev, 2024; Hajiyev, Ismayilbeyli, 2024). This article is also devoted to the technology of using virtual demonstrations and experiments in teaching physics in secondary schools.

Methodology

In the 7th grade physics course of secondary school, students are introduced to electric circuits and circuit elements using the virtual laboratory simulation “Constant Current” in the teaching of the topics of the section “Electrical Circuits and Circuit Elements”.

Through this simulation, an electric circuit is assembled by connecting a current source, a lamp, and a switch through wires (PhET Interactive Simulations. 2025, https://phet.colorado.edu/az/simulations/ circuit -construction-kit-dc-virtual-lab). Students visually observe how current is generated in the circuit and learn the conditions for the generation of current.

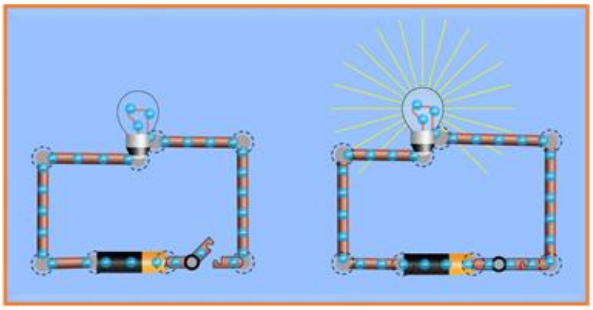

Figure 1 Figure 2

When the switch is open, no current flows through the circuit, and in this case the lamp does not light up. However, when the switch is closed, current flows through the circuit, and in this case the lamp lights up (Figure 1; 2). Based on this visual demonstration, students determine the following conclusions:

- In metal wires, electric current is created by free electrons moving in a regular manner.
- For current to exist in a circuit, there must be a current source and free charge carriers (in metals – electrons, in electrolytes – positive and negative ions, etc.).
- In metal wires, the direction of electric current is considered to be the opposite of the direction of movement of electrons.

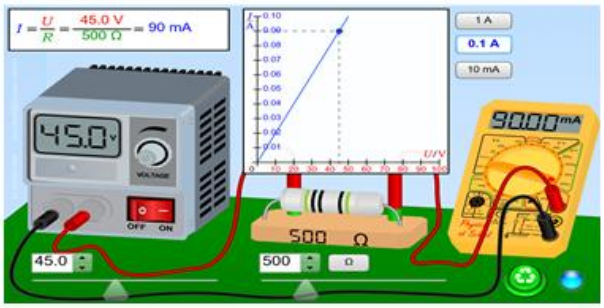

Figure 3

In teaching the topic of "Ohm's law", a circuit consisting of a current source, a resistor (lamp), a switch, an ammeter and a voltmeter is assembled using the simulation of the same name (Physics animation/Simulation2025.https://www.vascak.cz/data/android/physicsatschool/templateimg.php?s=ele ohm&l=ru). Students observe that as the voltage at the ends of the circuit (lamp) increases, the value of the current also increases by the same amount. According to Ohm's law, the ratio of the voltage at the ends of the circuit to the current intensity is constant (Figure 3). This ratio is called electrical resistance and its value does not change:

$$R = \frac{U}{I} = cosnt$$

In the 8th grade physics course of secondary school, it is advisable to use a virtual simulation called "Calorimeter" to carry out the practical work "Determination of the specific heat capacity of a solid" (Figure 4;5). (Hajiyev, 2024. Physics animation/Simulation 2025, https://www.vascak.cz/data/android/ physicsat-school/templateimg.php?s=mf_kalorimetr&l=ru).

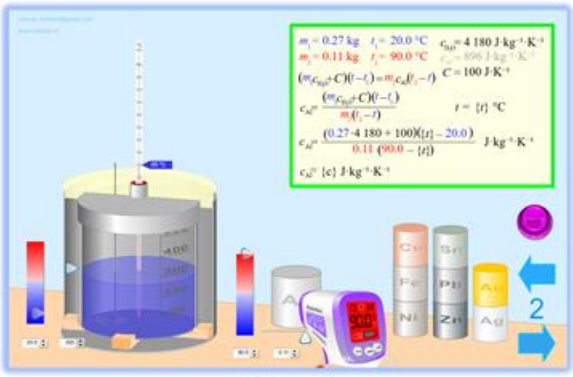

Figure 4

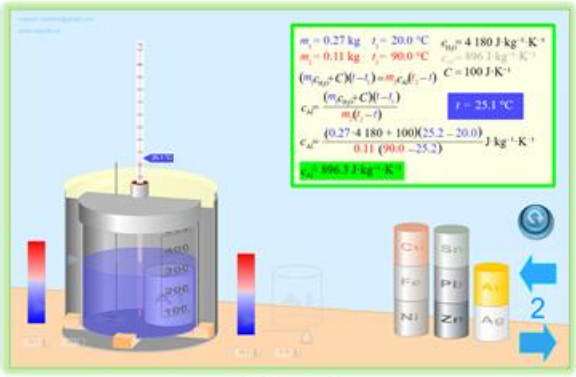

Figure 5

Students safely determine the specific heat capacity of a cylindrical solid made of various materials (for example, aluminum) through this simulation.

$$c_{Al} = \frac{c_{H_2O} m_{H_2O}(t - t_1) + c_{cal} m_{cal}(t - t_1)}{m_{Al}(t_2 - t)}$$

$$c_{Al} = \frac{c_{H_2O} m_{H_2O}(t - t_1) + C_{cal}(t - t_1)}{m_{Al}(t_2 - t)}$$

Where c_{H_2O}–specific heat capacity of water, m_{H_2O}–mass of water in the calorimeter, C_{cal}–calorimeter heat capacity, t_1–initial temperature of water and calorimeter, t_2–initial temperature of cylinder, t–steady temperature of the system.

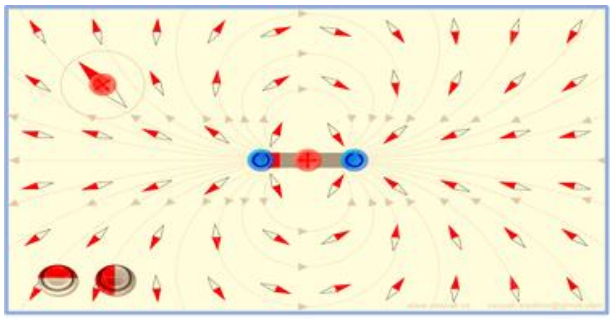

Figure 6

Using this virtual simulation, the specific heat capacities of other cylinders made of different materials can also be determined.

In the 9th grade physics course, the connection between electric and magnetic phenomena is explained in the process of teaching the topics of the chapter “Magnetic Field”. To demonstrate the appearance of a magnetic field, the teacher can use the animation “Magnet” (Figure 6), and to demonstrate the magnetic field of a rectilinear current, the animation “Magnetic Field of a Current-Carrying Wire” (Hajiyev, Ismayilbeyli, 2024; https://www.vascak. cz/ data/android/ physicsatschool/ templateimg.php?s=mag magnet &l =ru).

By demonstrating the virtual experiments “Magnetic Field of a Current-Carrying Wire”, the teacher draws the attention of students to the formation of a permanent magnetic field around a current-carrying wire and explains that the formation of this field is associated with the movement of electric charges. Students see that the magnetic field lines around a straight current are arranged in concentric circles (Figure7;8) (Physics animation/Simulation. 2025, https://www.vascak.cz/data/android/physicsatschool/ templa-teimg. php? s=mag vodic&l=ru).

By demonstrating a virtual experiment, it is determined that there is a relationship between the direction of the current in the wire and the direction of the magnetic field lines. It is noted that when several magnetic needles are placed around a current-carrying wire, the north direction of the magnetic needles is directed in the direction of the magnetic induction vector. Students are explained how the direction of the lines of force changes based on the change in the direction of the magnetic needles by changing the direction of the current flowing through the

conductor. That is, it is determined experimentally that the direction of the lines of force of the magnetic field is related to the direction of the current flowing through the conductor. Students are explained how to determine the direction of the lines of force using the right-hand rule and the right-hand rule.

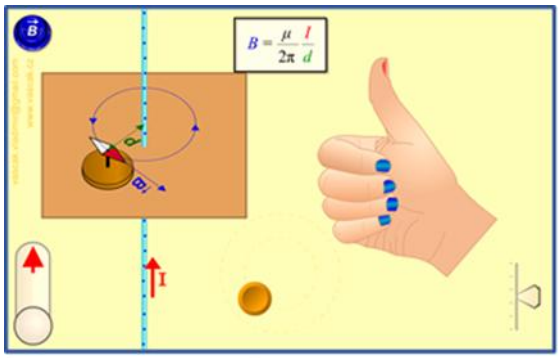

Figure 7

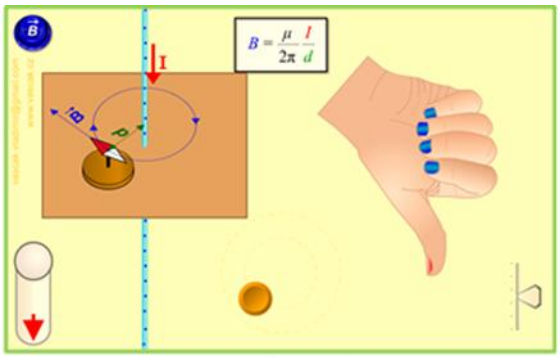

Figure 8

In 1820, the French physicist A. Ampère, based on his experiments, determined that there are magnetic interactions between parallel current-carrying conductors. The interaction between parallel current-carrying conductors can be demonstrated using an animation called "Ampere's law" (Physics animation/ Simulation 2025. https://www.vascak.cz/data/android/physicsatschool/templateimg.php?s=ele amper &l=ru).

Based on the demonstration, it is determined that when the currents flowing through parallel conductors are in the same direction, they attract each other, since opposite poles of magnetic fields are created between them (Figure 9).

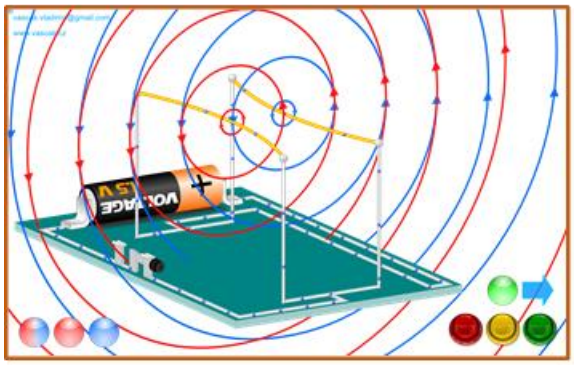

Figure 9

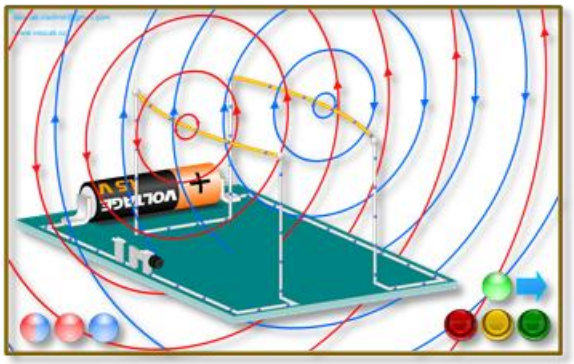

Figure 10

When the currents flowing through parallel conductors are in opposite directions, they repel each other because the same poles of the magnetic field are created between them (Figure 10).

The value of the magnetic interaction force between parallel conductors with current depends on the current intensity in the conductors, the length of the conductors, and the distance between them.

$$F = \frac{\mu}{2\pi}\frac{I_1 \cdot I_2}{d} \cdot \Delta l$$

Here F–modulus of magnetic interaction force between parallel conductors with current, μ–magnetic permeability of the substance, I_1 and I_2 –current intensity in parallel conductors, Δd–length of conductors, d–distance between them. The unit of current intensity in the BS–ampere (A) was determined based on the magnetic interaction force between parallel conductors with current.

Findings and Discussion

After the students master the computer models, they can be offered to perform some experiments at home.

The use of computer models in teaching high school physics provides teachers and students with the following opportunities.

- Advantages of computer models:

- Helps students understand difficult concepts more easily;
- Visual presentation of results facilitates learning.
- Allows experimentation with variable parameters;
- Permits unlimited repetition of experiments.

Although practical work using computer models cannot replace real laboratory work, it develops the skills of students. Therefore, it is appropriate to use virtual laboratory experiments to carry out practical work in teaching physics in secondary schools.

The use of virtual demonstrations and experiments in the process of teaching physics in secondary schools provides teachers and students with the following opportunities:

For teachers:

- more time for individual support to weak students;
- rapid diagnostics of students' practical work results.

For students:

- ability to perform independent practical work using computer models;
- analyzing and interpreting physical phenomena and laws through individual practice;
- opportunity to conduct practical work that cannot be performed during lessons;
- opportunity to carry out virtual experiments outside class hours;
- skills to use a computer as a learning tool;
- ability to work with electronic resources.

Conclusion:

The role of technology in the modern education system is increasing. Especially in the teaching of physics, computer models and virtual laboratories serve to better understand physical phenomena, develop experimental skills and increase activity in the teaching process. Computer models open up new opportunities for both teachers and students and ensure safe, cost-effective and efficient implementation of experiments.

Virtual laboratories and simulations are powerful tools for understanding physical phenomena and complex laws.

The application of computer models in teaching physics is one of the most effective directions of modern pedagogical technology.

Based on the findings of the study, the integration of computer models into physics teaching offers substantial pedagogical benefits. First and foremost, computer-based simulations contribute to the development of students' scientific worldview by allowing them to observe, analyze, and interpret physical phenomena in a structured and interactive environment. Through repeated experimentation and manipulation of variables, students gradually strengthen their experimental and research skills, gaining experience that mirrors authentic scientific inquiry.

Moreover, the visual representation of abstract physical concepts significantly enhances conceptual understanding and increases students' motivation to learn. When learners are able to see dynamic models of otherwise invisible processes, misconceptions become easier to identify and correct. In addition, computer models provide a safe environment for conducting experiments that would otherwise be dangerous, costly, or technically complex in real laboratory settings. This combination of safety, flexibility, and interactivity ultimately improves the overall quality of learning and promotes deeper cognitive engagement.

To maximize these benefits, systematic steps should be taken at the institutional level. Professional development programs should be organized to support physics teachers in developing the competencies necessary to design and effectively implement computer-based models in their lessons. At the same time, secondary school physics classrooms need to be equipped with modern technological infrastructure to ensure equal access to digital learning tools. Furthermore, curriculum-aligned lesson plans that integrate virtual laboratories should be developed to provide methodological guidance for teachers. Finally, digital teaching resources - such as Physics Animations, PhET simulations, Yenka, and Algodoo – should be incorporated into the curriculum in a structured and sustainable manner to ensure their consistent pedagogical application.

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The Effect of Deepfake Awareness on Perceived Media Credibility: The Mediating Role of Digital Trust and the Moderating Role of Media Literacy

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Abstract
The rapid advancement of artificial intelligence has facilitated the widespread use of deepfake technologies, creating significant challenges for information reliability, digital trust, and media credibility. As AI-generated content becomes increasingly difficult to distinguish from authentic media, understanding the factors that influence individuals' evaluations of media credibility has become an important issue in communication research. Accordingly, this study examines the effect of deepfake awareness on perceived media credibility while investigating the mediating role of digital trust and the moderating role of media literacy. A quantitative research design employing a correlational survey model was adopted. The study was conducted with 356 individuals residing in the six districts of the Turkish Republic of Northern Cyprus (TRNC): Nicosia, Famagusta, Kyrenia, İskele, Güzelyurt, and Lefke. Data were collected through face-to-face and online questionnaires. The research instrument included four constructs: Deepfake Awareness, Digital Trust, Perceived Media Credibility, and Media Literacy. The collected data were analyzed using IBM SPSS Statistics 28.0. Descriptive statistics, reliability analysis, independent samples t-test, one-way ANOVA, Pearson correlation analysis, and regression analyses were performed. The findings revealed that participants demonstrated high levels of deepfake awareness and media literacy, while digital trust and perceived media credibility were above average. Deepfake awareness was found to have a significant positive effect on perceived media credibility and digital trust. Furthermore, digital trust partially mediated the relationship between deepfake awareness and perceived media credibility, whereas media literacy significantly moderated this relationship by strengthening individuals' ability to evaluate AI-generated content critically. Significant differences were also observed according to age, educational level, and district of residence. The findings contribute to the growing literature on artificial intelligence, digital communication, and media studies by providing empirical evidence from the TRNC. The study also offers practical implications for universities, policymakers, and media organizations by emphasizing the importance of strengthening media literacy and digital trust to reduce the negative effects of AI-generated misinformation and enhance media credibility.
Keywords: Deepfake Awareness, Perceived Media Credibility, Digital Trust, Media Literacy, Artificial Intelligence, Digital Communication, TRNC.

Introduction

The rapid transformation of digital communication technologies has significantly changed the processes of information production and dissemination. In particular, with the advancement of generative artificial intelligence technologies, it has become possible to artificially generate text, audio, image, and video content. While these developments have created new opportunities in the field of communication, they have also introduced new challenges regarding information security and content accuracy. Deepfake technologies, one of the most remarkable examples of AI-based content generation in recent years, enable the creation of highly realistic digital content that imitates real individuals and events. Although these technologies are used in entertainment, education, and marketing, they also increase the risks of misinformation and disinformation (Vaccari & Chadwick, 2020; Westerlund, 2019).

With the proliferation of deepfake technologies, one of the prominent concepts in communication research has become digital trust. Digital trust refers to individuals' beliefs regarding the accuracy, reliability, and source of the content they encounter in online environments. Studies indicate that exposure to deepfake content not only increases the risk of believing misinformation but also weakens individuals' trust in the media system. As the distinction between real and artificial content becomes increasingly difficult to discern, individuals' levels of skepticism toward media content increase (Chesney & Citron, 2019; UNESCO, 2024).

Perceived media credibility is defined as the level of trust individuals place in media organizations and media content. While credibility in traditional media environments has largely been evaluated based on the reputation of the news source, determining the accuracy of content has become increasingly difficult in the age of artificial intelligence. With the development of deepfake technologies, it has been suggested that individuals' trust in news sources and digital content may decline. This situation particularly increases the tendency among young individuals to question the accuracy of media content (Tandoc, Lim, & Ling, 2018; UNESCO, 2024).

Recent studies have revealed that the effect of deepfake content on perceived media credibility is not direct. At this point, the concept of digital trust is considered an important explanatory variable. Individuals' levels of trust in digital platforms may shape the effect of deepfake awareness on perceived media credibility. It has been observed that individuals with higher levels of digital trust exhibit different behaviors in the process of evaluating media content (Shin, 2021; Kozyreva, Lewandowsky, & Hertwig, 2020).

One of the important factors that may reduce the negative effects of deepfake content is media literacy. Media literacy encompasses individuals' abilities to analyze, evaluate, and verify media messages. Recent studies indicate that individuals with higher levels of media literacy are more successful in identifying AI-generated content and are more resistant to misinformation. Therefore, media literacy is considered to play a moderating role in the relationship between deepfake awareness and perceived media credibility (McGrew, 2020; Jones-Jang, Mortensen, & Liu, 2021).

The Turkish Republic of Northern Cyprus (TRNC), with its multicultural higher education structure that hosts students from different countries, provides an environment in which digital media use is highly prevalent. University students actively use social media platforms and frequently encounter AI-supported content. Nevertheless, studies examining the relationship between deepfake awareness, digital trust, and perceived media credibility within the TRNC context remain quite limited. This situation necessitates the examination of the issue within the local context (Baybars-Hawks, 2022; Livingstone, 2022).

The aim of this study is to examine the effect of deepfake awareness on perceived media credibility among university students studying in the Turkish Republic of Northern Cyprus (TRNC), and to reveal the mediating role of digital trust and the moderating role of media literacy in this relationship. The study is expected to contribute to the current literature on artificial intelligence, digital trust, and media credibility, and to support policy development processes related to media literacy in higher education institutions (Shin, 2021; UNESCO, 2024).

1.1. Deepfake Technology and Deepfake Awareness

Deepfake technology is defined as a technology that enables the imitation of the images, voices, and behaviors of real individuals in digital environments through the use of artificial intelligence and deep learning algorithms. Particularly in recent years, with the advancement of generative artificial intelligence applications, the production and dissemination of deepfake content have increased significantly. This development has brought issues of information accuracy, credibility, and ethics to the forefront of communication processes (Kırık & Özkoçak, 2023; Westerlund, 2019). With the development of deepfake technologies, individuals' ability to recognize and evaluate such content has become increasingly important. Deepfake awareness refers to the extent to which individuals are able to distinguish manipulative content generated by artificial intelligence and evaluate its potential effects. Individuals with higher levels of awareness are considered to be more resistant to misinformation and disinformation (Çömlekçi, 2020; Vaccari & Chadwick, 2020).

1.2. Perceived Media Credibility

Perceived media credibility refers to the level of trust that individuals place in media organizations and media content. The accuracy, objectivity, and credibility of media content directly influence individuals' media use behaviors. Particularly with digital transformation, perceived media credibility has become one of the primary areas of communication research (Balcı & Bekiroğlu, 2019). The acceleration of information production in digital media environments has facilitated the spread of misinformation and disinformation. This situation has led to a decline in trust in media organizations and has caused individuals to question news content more critically. Deepfake technologies are also among the significant factors that deepen this crisis of trust (Tandoc, Lim, & Ling, 2018; Çömlekçi, 2020).

1.3. Digital Trust

Digital trust refers to the level of trust that individuals place in digital platforms, online systems, and the content delivered through these systems. Digital trust encompasses elements such as information security, data privacy, and content accuracy. A high level of digital trust contributes to individuals' more effective use of digital platforms

(Shin, 2021). In the process of media use, digital trust is regarded as an important determinant. As individuals' trust in online platforms increases, their tendency to accept media content also increases. In contrast, practices such as deepfakes and disinformation may reduce digital trust. Digital trust is considered to be an important variable affecting perceived media credibility (Kozyreva, Lewandowsky, & Hertwig, 2020).

1.4. Media Literacy

Media literacy refers to individuals' abilities to analyze, evaluate, and interpret media content from a critical perspective. Today, media literacy encompasses not only traditional media but also digital media environments. Particularly in the digital age, information verification skills are regarded as one of the fundamental components of media literacy (RTÜK, 2023). Digital media literacy encompasses individuals' abilities to evaluate the accuracy of the content they encounter on the Internet and to distinguish misinformation. With the proliferation of deepfake content, the importance of media literacy has increased even further. Individuals with higher levels of media literacy are considered to be more capable of identifying manipulative content generated by artificial intelligence (McGrew, 2020; Altun, 2022).

1.5. The Relationship Between Deepfake Awareness, Digital Trust, and Perceived Media Credibility

The literature suggests that deepfake awareness may influence perceived media credibility. Individuals who are aware of deepfake content tend to evaluate media content more carefully and are more likely to engage in content verification behaviors. However, digital trust is considered to play an important role in shaping this relationship (Vaccari & Chadwick, 2020; Shin, 2021).

Digital trust is expected to play a mediating role in the relationship between deepfake awareness and perceived media credibility. Individuals with higher levels of media literacy are reported to evaluate deepfake content more critically, and their perceptions of media credibility may be affected differently by this situation. Considering media literacy as a moderating variable constitutes the theoretical foundation of the present study (Jones-Jang, Mortensen, & Liu, 2021; Çömlekçi, 2020).

The Turkish Republic of Northern Cyprus (TRNC) is one of the regions where digital communication technologies are widely used due to its high Internet usage rate and multicultural university structure. University students, in particular, are in constant interaction with social media platforms, online news sources, and AI-supported digital applications. This increases their likelihood of encountering deepfake content, misinformation, and AI-generated media messages. In an environment characterized by intensive digital content consumption, identifying the factors that influence students' trust in media content is of considerable importance (KKTC İstatistik Kurumu, 2024). A significant proportion of students studying at universities in the TRNC are international students from different countries. Students from diverse cultural backgrounds may differ in their media use habits, levels of digital trust, and media literacy skills. This necessitates examining the relationship between deepfake awareness and perceived media credibility within the TRNC context. In particular, identifying the effects of AI-supported content disseminated through digital media environments on students' trust in media will contribute to the development of media literacy policies in higher education institutions (YÖDAK, 2024). It is evident that academic studies addressing the relationship between deepfake technologies, digital trust, and perceived media credibility in the TRNC remain very limited. While existing studies have primarily focused on social media use, digital communication, and media literacy, the effects of AI-supported manipulative content on trust in media have not been sufficiently examined. Therefore, the present study is expected to contribute to both the TRNC literature and the international communication literature.

Research Objective

The aim of this study is to examine the effect of deepfake awareness on perceived media credibility among university students studying in the Turkish Republic of Northern Cyprus (TRNC). In addition, the study aims to reveal the mediating role of digital trust and the moderating role of media literacy in the relationship between deepfake awareness and perceived media credibility. The study also seeks to determine university students' levels of awareness of AI-generated content, evaluate their levels of digital trust, and examine their perceptions of the credibility of media content. Based on the findings, the study aims to provide recommendations for enhancing media literacy and digital trust in higher education institutions in the TRNC.

Research Questions

The following research questions were addressed in this study:

1. What are the levels of deepfake awareness among university students?
2. What are the levels of perceived media credibility among university students?
3. What are the levels of digital trust among university students?
4. What are the levels of media literacy among university students?

5. Does deepfake awareness have a significant effect on perceived media credibility?
6. Does deepfake awareness have a significant effect on digital trust?
7. Does digital trust have a significant effect on perceived media credibility?
8. Does digital trust play a mediating role in the relationship between deepfake awareness and perceived media credibility?
9. Does media literacy play a moderating role in the relationship between deepfake awareness and perceived media credibility?
10. Do university students' levels of deepfake awareness differ according to gender, age, educational level, and frequency of social media use?

Research Method

A quantitative research method was employed in this study. The quantitative research method enables the measurement of individuals' opinions, attitudes, and perceptions regarding a particular subject through numerical data and allows the relationships among variables to be examined using statistical methods. In this study, the relationships among deepfake awareness, digital trust, media literacy, and perceived media credibility of individuals living in the Turkish Republic of Northern Cyprus (TRNC) were examined. The data were collected using the survey technique, and the collected data were analyzed using various statistical analysis methods.

Research Model

The study was conducted using a correlational survey design, one of the quantitative research designs. A correlational survey design is a research design that aims to determine the existence and direction of the relationship between two or more variables. In this study, while examining the effect of deepfake awareness on perceived media credibility, the mediating role of digital trust and the moderating role of media literacy were tested. In the conceptual model of the study, deepfake awareness was considered the independent variable, perceived media credibility the dependent variable, digital trust the mediating variable, and media literacy the moderating variable. The research model was developed in accordance with the structural equation modeling (SEM) approach.

Population and Sample

The population of the study consisted of individuals aged 18 and over living in the Turkish Republic of Northern Cyprus (TRNC). The study was conducted with individuals residing in the six districts of the TRNC: Nicosia, Famagusta, Kyrenia, İskele, Güzelyurt, and Lefke. The sample consisted of a total of 356 individuals living in these districts who voluntarily participated in the study. The participants were selected from different age groups, genders, educational levels, and occupational groups, and care was taken to ensure that the sample was representative of the TRNC population. A convenience sampling method, one of the non-probability sampling methods, was employed in the study. Data were collected through face-to-face and online surveys. Based on the collected data, the relationships among deepfake awareness, digital trust, media literacy, and perceived media credibility were analyzed. The levels of awareness of AI-supported content and perceptions of media credibility among individuals living in the TRNC were comprehensively evaluated.

Data Collection Instruments

A structured questionnaire was used as the data collection instrument in this study. The questionnaire consisted of two sections. The first section included questions regarding the demographic characteristics of the participants, while the second section consisted of scale items measuring deepfake awareness, digital trust, perceived media credibility, and media literacy. To measure media literacy, the Media Literacy Level Determination Scale developed by Karaman and Karataş (2009) was used with the necessary permission. The items related to the other variables were adapted from the relevant literature. The scale consisted of a total of 22 items, and all items were measured using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The content validity of the data collection instrument was evaluated based on expert opinions, and the necessary revisions were made before the instrument was finalized. The research data were collected from 356 participants residing in the districts of Nicosia, Famagusta, Kyrenia, İskele, Güzelyurt, and Lefke in the TRNC through face-to-face and online surveys.

Results

Table 1. Demographic Characteristics of the Participants (N = 356)

Variable	Group	Frequency(n)	Percentage (%)
Gender	Female	191	53.7
	Male	165	46.3
	Total	356	100.0
Age	18-25 years	98	27.5

	26-35 years	116	32.6
	36-45 years	82	23.0
	46 years and above	60	16.9
	Total	356	100.0
Educational Level	High School	72	20.2
	Associate Degree	54	15.2
	Bachelor's Degree	149	41.9
	Postgraduate	81	22.7
	Total	356	100.0
District	Nicosia	92	25.8
	Famagusta	74	20.8
	Kyrenia	68	19.1
	İskele	45	12.6
	Güzelyurt	41	11.5
	Lefke	36	10.1
	Total	356	100.0
Daily Internet Use	1-2 hours	41	11.5
	3-4 hours	86	24.2
	5-6 hours	109	30.6
	7 hours or more	120	33.7
	Total	356	100.0
Social Media Use	Less than 1 hour	38	10.7
	1-3 hours	104	29.2
	4-6 hours	123	34.6
	7 hours or more	91	25.5
	Total	356	100.0

When Table 1 is examined, it can be seen that 53.7% of the participants were female and 46.3% were male. The majority of the participants (32.6%) were between the ages of 26 and 35. In terms of educational level, the highest proportion of the participants held a bachelor's degree (41.9%). Regarding the distribution of participants by district, Nicosia ranked first (25.8%), followed by Famagusta (20.8%) and Kyrenia (19.1%). In terms of daily Internet use, 33.7% of the participants reported using the Internet for seven hours or more per day. Regarding social media use, 34.6% of the participants stated that they used social media for 4–6 hours per day.

Table 2. Reliability Analysis Results of the Scales

Scale	**Number of Items**	**Cronbach's (α)**
Deepfake Awareness	5	.874
Digital Trust	5	.891
Perceived Media Credibility	6	.862
Media Literacy	6	.903
Overall Scale	22	.915

Cronbach's alpha coefficients were calculated to determine the reliability of the scales used in the study. The results indicated that the Cronbach's alpha coefficient was .874 for the Deepfake Awareness Scale, .891 for the Digital Trust Scale, .862 for the Perceived Media Credibility Scale, and .903 for the Media Literacy Scale. All Cronbach's alpha coefficients exceeded .80. According to the literature, a Cronbach's alpha coefficient of .70 or above indicates acceptable reliability, whereas a coefficient of .80 or above indicates high reliability. Accordingly, all scales used in this study can be considered highly reliable. Furthermore, the Cronbach's alpha coefficient of the overall 22-item scale was calculated as .915. This finding indicates that the data collection instrument demonstrated a very high level of internal consistency and can be regarded as a reliable measurement instrument for this study.

Table 3. Normality Test Results

Variable	**Skewness**	**Kurtosis**
Deepfake Awareness	-1.284	1.758
Digital Trust	-1.107	1.326

Perceived Media Credibility	-0.891	0.974
Media Literacy	-1.442	2.103

To determine whether the variables used in the study were normally distributed, skewness and kurtosis values were examined. According to the analysis results, the skewness and kurtosis values were -1.284 and 1.758 for Deepfake Awareness, -1.107 and 1.326 for Digital Trust, -0.891 and 0.974 for Perceived Media Credibility, and -1.442 and 2.103 for Media Literacy, respectively. According to George and Mallery (2019), skewness and kurtosis values within the range of ±2 indicate that the data are normally distributed. The findings showed that the skewness and kurtosis values for all variables fell within the acceptable range. Therefore, it was concluded that the data were normally distributed and that parametric analyses could be performed.

Table 4. Descriptive Statistics for the Scales

Scale	**Minimum**	**Maximum**	**Mean**	**Standard Deviation**
Deepfake Awareness	1.00	5.00	4.1304	0.81125
Digital Trust	1.00	5.00	3.9587	0.83241
Perceived Media Credibility	1.00	5.00	3.8245	0.87133
Media Literacy	1.00	5.00	4.1468	0.73452

As shown in Table 4, the participants demonstrated high levels of media literacy (M = 4.1468) and deepfake awareness (M = 4.1304). The mean scores for digital trust (M = 3.9587) and perceived media credibility (M = 3.8245) were also above average. These findings indicate that the participants exhibited a high level of awareness of digital media content and possessed sufficient awareness to evaluate media content critically.

Table 5. ANOVA Results for Deepfake Awareness, Digital Trust, Perceived Media Credibility, and Media Literacy by Age Group

Scale	**Age Group**	**n**	**M**	**SD**	**F**	**p**
Deepfake Awareness	18-25	98	4.29	0.68	5.842	0.001*
	26-35	116	4.18	0.73		
	36-45	82	4.03	0.79		
	46+	60	3.87	0.85		
Digital Trust	18-25	98	4.12	0.71	4.916	0.002*
	26-35	116	4.03	0.74		
	36-45	82	3.88	0.81		
	46+	60	3.72	0.86		
Perceived Media Credibility	18-25	98	3.94	0.77	3.756	0.011*
	26-35	116	3.88	0.81		
	36-45	82	3.74	0.85		
	46+	60	3.61	0.89		
Media Literacy	18-25	98	4.26	0.61	6.218	< .001*
	26-35	116	4.18	0.66		
	36-45	82	4.07	0.71		
	46+	60	3.91	0.77		

*Note. *p* < .05.*

Statistically significant differences were found among the age groups for all variables. In particular, younger participants demonstrated higher levels of deepfake awareness, digital trust, and media literacy. The results of the one-way analysis of variance (ANOVA) indicated statistically significant differences among the age groups for all variables ($p < .05$). Specifically, participants aged 18–25 exhibited higher mean scores for deepfake awareness, digital trust, and media literacy than the other age groups. This finding may be attributed to younger individuals' greater exposure to digital technologies and artificial intelligence applications.

Table 6. ANOVA Results for Deepfake Awareness, Digital Trust, Perceived Media Credibility, and Media Literacy by Educational Level

Scale	Educational Level	n	M	SD	F	p
Deepfake Awareness	High School	72	3.82	0.84	8.271	< .001*
	Associate Degree	54	3.97	0.79		
	Bachelor's Degree	149	4.16	0.71		
	Postgraduate	81	4.35	0.64		
Digital Trust	High School	72	3.71	0.87	6.938	< .001*
	Associate Degree	54	3.84	0.81		
	Bachelor's Degree	149	4.01	0.73		
	Postgraduate	81	4.18	0.69		
Perceived Media Credibility	High School	72	3.59	0.91	4.224	0.006*
	Associate Degree	54	3.73	0.86		
	Bachelor's Degree	149	3.87	0.79		
	Postgraduate	81	4.02	0.74		
Media Literacy	High School	72	3.88	0.82	10.512	< .001*
	Associate Degree	54	4.01	0.75		
	Bachelor's Degree	149	4.21	0.63		
	Postgraduate	81	4.37	0.58		

Note. $p < .05$.

The findings indicate that levels of deepfake awareness, digital trust, perceived media credibility, and media literacy increased as educational level increased. Statistically significant differences were found across educational levels for all variables. According to the results of the one-way analysis of variance (ANOVA), educational level was associated with statistically significant differences in all variables ($p < .05$). In particular, participants with postgraduate education had the highest mean scores across all dimensions. These findings suggest that higher educational attainment positively influences individuals' ability to evaluate digital content and analyze media messages.

Table 7. ANOVA Results for Deepfake Awareness by District

District	n	M	SD
Nicosia	92	4.26	0.68
Famagusta	74	4.15	0.71
Kyrenia	68	4.08	0.74
İskele	45	4.02	0.77
Güzelyurt	41	3.96	0.81
Lefke	36	3.91	0.84

F = 3.962, p = .002

Participants' levels of deepfake awareness differed significantly according to the district in which they resided. The highest mean score was observed among participants living in Nicosia. The analysis revealed a statistically significant difference in deepfake awareness across districts (**F** = 3.962, **p** = .002). While participants residing in Nicosia had the highest mean score, those living in Lefke had the lowest. This difference may be attributed to greater exposure to digital media and artificial intelligence technologies among individuals living in larger urban areas. Overall, the findings suggest that the district of residence has a significant effect on deepfake awareness.

Table 8. Correlation Analysis of the Variables

Variables	1	2	3	4
1. Deepfake Awareness	1			
2. Digital Trust	.682**	1		
3. Media Literacy	.614**	.577**	1	
4. Perceived Media Credibility	.541**	.731**	.493**	1

Note. **p < .001.

According to the results of the correlation analysis, there was a strong, positive, and statistically significant relationship between deepfake awareness and digital trust ($r = .682$, $p < .001$). A positive and statistically significant relationship was also found between deepfake awareness and perceived media credibility ($r = .541$, $p < .001$). The strongest relationship observed in the study was between digital trust and perceived media credibility ($r = .731$, $p < .001$). This finding indicates that digital trust is one of the most important determinants of perceived

media credibility. Furthermore, media literacy was found to be positively and significantly correlated with all other variables.

Conclusion

This study examined the effect of deepfake awareness on perceived media credibility among individuals living in the Turkish Republic of Northern Cyprus (TRNC), while also evaluating the mediating role of digital trust and the moderating role of media literacy in this relationship. The findings revealed that the participants demonstrated high levels of deepfake awareness and media literacy, whereas their levels of digital trust and perceived media credibility were above average.

The findings further indicated that deepfake awareness had a significant and positive effect on perceived media credibility. Individuals who were aware of the existence of deepfake content were found to evaluate media content more carefully and to exhibit more informed attitudes toward perceived media credibility. In addition, deepfake awareness was found to have a significant effect on digital trust.

One of the most important findings of the study is that digital trust plays a mediating role in the relationship between deepfake awareness and perceived media credibility. This finding demonstrates that as individuals' trust in digital environments increases, the way they evaluate media content also changes. In other words, the effect of deepfake awareness on perceived media credibility is partially mediated by digital trust.

The study also found that media literacy plays a moderating role. Individuals with higher levels of media literacy were better able to approach deepfake content critically and behaved more consciously when evaluating the credibility of media content. This finding suggests that media literacy is an important competency that protects individuals against misinformation and manipulative content in the digital age.

The findings related to the demographic variables revealed that younger individuals and those with higher educational attainment demonstrated higher levels of deepfake awareness, digital trust, and media literacy. These findings indicate that individuals with greater exposure to digital technologies are more aware of AI-supported content.

In conclusion, the findings of this study demonstrate that deepfake technologies are an important factor influencing perceived media credibility, that digital trust plays a critical role in this relationship, and that media literacy strengthens individuals against digital manipulation. Based on these findings, it is recommended that media literacy education be expanded in higher education institutions, educational programs aimed at increasing deepfake awareness be developed, and policies that support digital trust be established. Such initiatives will enable individuals to evaluate AI-supported content more critically and access reliable information in digital media environments.

Recommendations

1. Educational activities aimed at increasing deepfake awareness and media literacy should be expanded in universities.
2. Seminars and workshops should be organized to equip students with digital trust and information verification skills.
3. Media organizations should develop more transparent practices for verifying AI-generated content.
4. Awareness campaigns should be conducted to help social media users recognize deepfake content.
5. Future research may examine different age, educational, and occupational groups through comparative studies.
6. It is recommended that media literacy and digital trust skills be more extensively integrated into educational curricula.

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The Effect of Media Literacy on Passive Audiences: The Case of Sakarya University Faculty of Communication

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ABSTRACT
Today, with the increase in digitalization, the diversity of media content has increased, and this change has enabled individuals to access information easily without questioning it (Güneş, 2013; Avşar, 2013). This situation, in particular, causes students to consume media content passively. Media literacy is the ability that not only enables individuals to question media content from a critical perspective but also allows them to move beyond being passive media audiences. The aim of this study is to measure the relationship between the media literacy levels of students at Sakarya University Faculty of Communication and their passive audience behaviors (Avşar, 2013; Karaman and Karataş, 2009).
This study was conducted within the scope of a quantitative research method, using a relational survey model and a descriptive method. The relational survey model used in the study is appropriate for examining the relationships between variables, while the descriptive method is suitable for revealing the current situations and behaviors of the participants. The participants consist of 100 students aged between 18 and 30 from the Sakarya University Faculty of Communication. However, the analyses were conducted based on 96 valid questionnaires. The data were collected using the Media Literacy Scale developed by Karaman and Karataş (2009), whose validity and reliability have been established. Within the scope of the study, students' passive audience behaviors were measured through critical consumption, which is one of the dimensions of media literacy. During the data collection process, a face-to-face questionnaire was administered. The questionnaire used in the study consists of two main sections: demographic information and scale items.
This study examined how the media literacy levels of students at Sakarya University Faculty of Communication affect their passive audience behaviors, and the collected data were analyzed using SPSS 27.0. According to the findings of the study, it was determined that students with
high media literacy levels at Sakarya University Faculty of Communication exhibit low levels of passive audience behavior.
Keywords: Communication, digital media, passive audience, active audience, media literacy

Introduction

Today, with digitalization, the development of communication technology has reached a transnational dimension and has brought about radical changes in people's daily life styles (Avşar, 2013). Technology, which adds a new dimension to communication forms, has also been instrumental in the development of mobile devices together with the internet. Therefore, adult individuals such as Sakarya University Faculty of Communication students have turned to various social media platforms in order to meet their need to obtain information. With the widespread use of social media, the internet, and mobile devices, students and adults have not only easily accessed information but have also transformed into media content producers (Beyaz Özbey, 2022). While the widespread use of digitalization increases the speed of communication, it has also brought forward the media literacy skill in the evaluation of media content from a critical perspective, as well as revealing the risk of passive media consumption in which students accept information without questioning. At this point, media literacy carries an important quality for individuals. Media literacy enables individuals not only to perceive media content but also to analyze it by filtering it through a critical perspective (Uyar and Asrak Hasdemir, 2023). This skill places students from the passive viewer position into the active viewer position that questions and analyzes media content (Bayraktar, 2022). In this study conducted on Sakarya University Faculty of Communication students, media literacy is not only approaching information critically but also the ability to consciously select and interpret the platforms that they use as a tool in accessing information (Avşar, 2013; Karaman and Karataş, 2009). Since students are in intensive interaction with digital media, it is assumed that their media literacy levels are also effective on passive audience indicators. According to the research findings obtained from Sakarya University Faculty of Communication students, it shows that students with high media literacy in the Faculty of

Communication have low passive audience behaviors, while students with low media literacy have high passive audience behaviors. This situation aims to reveal the result that media literacy has an important effect on variables. This study aims to examine the effect of media literacy levels of Sakarya University Faculty of Communication students on passive audience behaviors. Thus, it is aimed to understand the positions of individuals against media in the digital age and to emphasize the importance of media literacy education (Öcal, 2024).

Communication

The phenomenon of communication is a concept as old as the history of humanity. Dating back to the process of human existence, communication in the historical process was first established by people through the use of certain sounds and signs. Later, this process, which began with cave paintings, gained permanence with the invention of writing and subsequently acquired a mass dimension with the development of the printing press, radio, and television (Aziz, 2012). In its most general definition, the concept of communication is defined as the transmission of emotions and information to the other party through the use of mass media and the provision of two-way information exchange. Human beings are social beings who constantly feel the need to communicate. In this context, since human beings are social beings, the need for communication arises in order to meet the need for obtaining information (Aytekin, 2020). Communication is an effective process of exchanging information carried out through various mass media, as well as the sharing of people's feelings and thoughts with others in daily life (TDK, 2023). At this point, the interaction between media literacy and communication is intertwined. Communication technology has today created a multidimensional and transnational communication environment, and thus, media literacy has gained great importance. This situation, in addition to the rapid flow of information, has also brought about the problem of content today. Therefore, media literacy has increased the necessity for students to analyze information critically. A student who has effective communication skills does not deal with media messages only superficially, but also examines them in depth (Köktener, 2019). In this case, effective communication skills strengthen the critical thinking aspect of media literacy and transform individuals from passive receivers into active and conscious participants who use media content consciously. As a result, media literacy and effective communication are an inseparable whole; by creating a habit of questioning among students and adults of all ages, they have become an important tool that develops individuals who do not consume information as passive viewers, but who critically analyze information and become active and conscious individuals. Therefore, media literacy appears as a form of behavior that is desired to be developed (Avşar, 2013; Köktener, 2019).

Digital Media

In today's digital world, the role of media has critical importance. Koçoğlu (2023) states that the origin of the concept of media is based on the Latin word *medium* and that the word *media* in English, as the plural form of this word, means "environment" or "tool" (p. 7). Today, the process of digitalization has brought about radical changes in forms of interaction by enabling people to communicate with one another and by providing fast and easy access to information. The first step of digitalization began with the invention of the printing press, and this made the emergence of newspapers possible. Later, this process continued with the establishment of radio and television. Thus, mass media turned into a systematic structure that could reach large audiences in social life through the internet and caused important developments to take place (Erişti, 2018). Digital transformation, although it is a well-established concept, is a concept that has emerged over time in parallel with the development of technology in the business processes of various institutions in order to obtain value (Baş, Erdoğan Tarakçı and Aslan, 2022, p. 9). Together with technological developments, digital media has transformed forms of communication in ways that cross borders over the last 50 years. In the 1970s, the use of computer technology in different public spheres led to its widespread adoption and thus formed the basis of digital access. People began to share data through computers (Emspak and Zimmermann, 2022). Another important factor that accelerated access to digital media was the widespread use of personal computers in the 1980s and the opening of the internet service known as the World Wide Web to the public in the 1990s. Thus, the era of a limited audience came to an end, and audiences turned into active consumers (History.com Editors, 2024; Pew Research Center, 2015). Today, digital media is a field that creates both risks and opportunities for students and adults. Therefore, rather than seeing social media only as a means of entertainment, it should be evaluated as a platform where economic, social, and cultural interactions are shaped (Beyaz Özbey, 2022). In this context, the concept of media literacy has become one of the most critical skills of the digital age. Passive audiences consume the content they receive from the media without questioning it and are exposed to misinformation. On the other hand, active audiences who consume media content do not accept information as it is, but evaluate it critically thanks to their media literacy skills. Therefore, digital media, in addition to providing rapid access to information, brings the concept of media literacy to the forefront in order to transform passive audience behaviors and develop critical thinking skills (Solmaz and Yılmaz, 2012).

Passive and Active Audience

The concept of the audience has undergone many changes and transformations from past to present. In the historical period, audiences first came to the forefront with the concept of the "reading public," and later, in the one-way communication form in which radio and television developed, they were evaluated in a passive receiver position (Avşar, 2013). The beginning of media literacy also dates back to this period. Later, in the work titled *Dialectic of Enlightenment* published in 1944, Frankfurt School thinkers Theodor W. Adorno and Max Horkheimer put forward the idea that mass media make individuals passive and make society uniform. They expressed that this is carried out through the "culture industry" of mass media (Adorno and Horkheimer, 1944/2005; Güneş, 2013). The active subject approach was developed in the 1970s by Elihu Katz and Jay G. Blumler, and by defending the view that audiences do not consume media content passively but make conscious choices, they emphasized the concept of the active audience (Koçoğlu, 2023; Sichach, 2024). Today, the audience has transformed not only into a consumer but also into a content producer, and this transformation has given critical importance to the concept of media literacy. Media literacy is an important tool in the process of evaluating social media content by passing it through a critical filter in the digital age (Avşar, 2013; Koçoğlu, 2023). Therefore, media literacy not only transforms students into active individuals in the production and consumption of digital media but also provides an important critical filtering benefit for individuals regarding content (Avşar, 2013).

Media Literacy

Media, as a form of communication that enables audiences to access information quickly, has undergone many changes and transformations over time in the historical process. The concept of media was first used in the 1920s and its origin is derived from the Latin word "medium." At this point, medium means environment and also tool (Koçoğlu and Akman, 2023). Media, as a tool that meets our need for communication and information exchange, has been used in different methods and forms in the historical process. This process first started with primitive humans using signs and sounds, and later it came into play with the development of newspapers, magazines, radio, and television. In the late 20th century, with the development of digital technologies and the internet, students and adults evolved from content consumers into content producers (Güneş, 2013; Koçoğlu, 2023). These developments have made media literacy a critical concept. Media literacy contributes to individuals passing media messages through a critical filter in a conscious manner and questioning the accuracy of information. These skills are especially important for passive students who accept media content without questioning it. While passive audience behavior increases the risk of exposure to misinformation, media literacy reduces this risk (Ankaralıgil, 2009; Kartal and Kıncal, 2009).

Purpose

The main purpose of this study is to address the effect of media literacy on passive audiences within the framework of Sakarya University Faculty of Communication students. Within the framework of this research, the effects of media literacy on passive audiences will be examined specifically for students of Sakarya University Faculty of Communication. Today, with digitalization, radical changes have occurred and it has become effective at all ages (Çakmak, 2019). The expansion of digital technology has led to the diversification of media content, and therefore students have created a risk by taking the position of passive audiences who consume the information they obtain from the media unconsciously without criticizing it. In order to reduce passive audience behaviors, media literacy, with its qualified structure, necessitates that students understand social media content from a critical perspective and consume and interpret it consciously (Karaduman, 2019). This research has three main purposes. The first purpose of the research, the second purpose is to examine the media literacy of students and their passive audience tendencies within the scope of Sakarya University Faculty of Communication and to determine the relationship between media literacy and passive audience behaviors.

The first purpose of this research is to analyze how undergraduate students studying within the Faculty of Communication are affected in terms of being passive audiences, in other words consumers, by measuring their media literacy levels in line with the data obtained. Today, the increase in the diversity of media content with digitalization not only enables individuals to access information quickly but also brings along a passive audience community that consumes information without criticizing it (Beyaz Özbey, 2022). In this context, the concept of media literacy can be evaluated as students moving out of the position of passive audiences and having the ability to critically analyze, interpret, and convey the content they consume from the media (Karaman and Karataş, 2009; Ankaralığil, 2020). The purpose of this study is to understand the attitudes and positions of communication students towards social media content and to determine the level of passive audience behavior of communication students who have a conscious level of media literacy.

The second purpose of this study is to examine and analyze the effect of the media literacy levels of Sakarya University Faculty of Communication students on their tendency to be passive audiences. The most important

difference that distinguishes a conscious media-literate individual from a passive audience is criticism. This is because a conscious media-literate individual selects the source of the information he or she wants to research in a purposeful manner and analyzes the content of the information by adopting a questioning approach (Kurt and Kürüm Yapıcıoğlu, 2010). In this context, the passive audience, at the most basic level, causes students to consume media content without criticizing it and to accept the obtained information without questioning it (Uyar and Asrak Hasdemir, 2023). The reason why students with high media literacy have low passive audience behaviors is that they analyze information content well and examine it from a critical perspective, whereas the main reason why students with low media literacy have high passive audience behaviors is that they tend to consume media content in a passive manner (Bayraktar, 2022). Passive audience behavior results from consuming media content without questioning it (Kurt and Kürüm, 2010). Television, which is one of the traditional mass media, and digital media platforms are among the primary factors affecting passive audience behavior. The excessive exposure to information created by these factors reduces the opportunity for students to analyze content critically. In news websites, this process creates a passive audience by minimizing the time to question information through attention-grabbing and interesting headlines. The effect of television and digital media platforms, which eliminate criticism and mental distance, on passive audience behaviors is significant (Yıldırım Ankaralığil, 2020). Media literacy transforms students from being passive audiences into conscious media-literate individuals who can evaluate events from a critical perspective by effectively using their abilities to directly interpret and evaluate the content they learn from social media platforms (Kurt and Kürüm, 2010; Bayraktar, 2022; Yıldırım Ankaralığil, 2020).

The third purpose of this study is to analyze the relationship between the media literacy levels of Sakarya University Faculty of Communication students and their passive audience tendencies. Today, with the effect of digitalization, portable computers and devices, especially the internet, have become among the rapidly developing media tools, and this situation has increased the diversity of media content and accelerated access to information; however, it has also created an audience that consumes content without questioning it. Students who closely follow technology, in addition to being exposed to a bombardment of information, find that accessing accurate information has become a matter of difficulty. Therefore, this situation creates a passive audience group (Güntay, 2019). The findings of the research show that students with high media literacy evaluate content from a critical perspective, whereas students with low media literacy consume content more unconsciously and are open to being influenced in a passive position (Avşar, 2013; Karaman and Karataş, 2009). It is expected that the findings of this research will contribute to understanding students' attitudes towards media and to studies aimed at improving media literacy. This article was designed within the scope of quantitative research and was conducted within the framework of the relational survey model in order to reach the relational difference between two variables and the descriptive method in order to reveal the current situations and behaviors of the participants. The participants consist of 100 students aged between 18 and 30 from Sakarya University Faculty of Communication. The data were interpreted by measuring passive audience behaviors indirectly, together with the dimensions formed under the name of critical consumption in the scale items, using the Media Literacy Scale developed by Karaman and Karataş (2009). As a data collection tool, the data were collected from students through a face-to-face questionnaire due to ease of access and time advantages. This study was conducted specifically on undergraduate students studying at Sakarya University Faculty of Communication and aims to examine the effect of media literacy levels on passive audience behaviors.

Significance

The importance of media literacy is remarkably significant for students, adults, and individuals in other age groups. In the age of technology, media literacy plays a critical role in this period in which digitalization is accelerating and aims to contribute to the development of students' and adults' abilities to consciously question the accuracy of the information they obtain from media content and to interpret it (Çakmak, 2019). The effect of media literacy on passive audiences, in the example of Sakarya University Faculty of Communication, not only increases individual awareness among students but also directly draws attention to the development of a culture of consciously consuming media content at a societal level by questioning media content from a critical perspective. In particular, the acceptance of information obtained by students from social media without questioning it causes them to move into a passive consumer position by weakening their critical thinking and interpretation skills (Uyar and Asrak Hasdemir, 2023). In this research, three main significances are mentioned. The first of these is to determine the media literacy level of undergraduate students studying at the Faculty of Communication. The second significance is to understand individuals' content consumption behaviors in digital media environments by examining students' passive audience tendencies. The third and final significance is to reveal the difference between media literacy level and passive audience behaviors.

The first significance of this research is to determine the media literacy levels of students within Sakarya University Faculty of Communication. Media literacy is the ability of students to effectively use their skills of questioning and evaluating the information they obtain from media content from an intellectual perspective and

to express it (Avşar, 2013; Karaman and Karataş, 2009). On the other hand, in the digitalizing world, media is no longer only a means of transmitting information and has become a power that affects the behaviors and attitudes of individuals in all age groups, especially students (Karaman and Karataş, 2009). Based on this, the social importance of the study aims to reveal the level at which knowing students' media literacy levels determines the level at which they accept media content with a certain attitude. Especially through social media, students are exposed to many true and false information, and if they accept this information without questioning it, they move into the passive audience position (Uyar and Asrak Hasdemir, 2023). Media literacy, at this point, has a remarkable importance and it is an undeniable fact that it helps students understand and question media content and helps them to display active audience behavior rather than passive audience behavior. Because the target of information pollution in media content is students and adults, and parental guidance plays a protective role here (Livingstone and Helsper, 2008; UNESCO, 2013). Students with high media literacy evaluate social media messages with active consumption and a critical perspective rather than passivity and at the same time interpret them. Through this research, it will be understood whether students have this skill and in this case it will be understood in which areas studies can be carried out (Bayraktar, 2022). Therefore, knowing students' media literacy levels, in addition to contributing to individual difference, emphasizes the importance of developing a conscious behavior against being exposed to information pollution in society.

If we refer to the second importance of the research, it is to analyze consumption behaviors in digital media environments by examining the passive audience tendencies of Sakarya University Faculty of Communication students. While media literacy is defined as students' expressing by effectively using their skills of interpreting and evaluating the messages they obtain from written, visual and auditory media contents (Avşar, 2013; Karaman and Karataş, 2009), passive, in other words inactive behavior, is expressed as consuming media contents without questioning them (Uyar and Asrak Hasdemir, 2023). In this respect, the research contributes to the development of social awareness in terms of knowing the media literacy level of the behaviors that students display in the face of media content. The abundance of social media platforms and the algorithms of media content on these digital platforms direct individuals towards constant consumption by distancing them from critical thinking. In this context, examining students' passive audience tendencies emphasizes its importance in terms of raising awareness among students towards social media content. Therefore, in this research, it is aimed to contribute to conscious media literacy that will reduce passive audience tendency by analyzing students' consumption habits of media content. In this context, media literacy, in addition to transforming students into active individuals in the production and consumption of digital media, provides them with the opportunity to act with a critical approach while evaluating the presented content (Avşar, 2013).

Finally, the third importance of the research is to comprehensively analyze the relationship between students' media literacy and passive audience behaviors. The benefit that analyzing this relationship will provide to the research is of great importance in terms of addressing the transformative effect of media literacy on students' passive media consumption (Avşar, 2013). Students whose media literacy level is not low, in addition to gaining awareness by easily questioning the information they obtain from media content, also become quite strong in their ability to evaluate and even, when necessary, to reproduce it (Avşar, 2013; Karaman and Karataş, 2009). Messages coming from the media have often been accepted by students without questioning and have caused students to turn into passive media audiences. Therefore, as mentioned in the previous sections, media literacy gains a critical dimension and the necessity for students and other consumer individuals to display a questioning approach has been emphasized. In this context, the research is of great importance in terms of revealing the effect of students' media literacy levels on passive audience behaviors and aiming to encourage the conscious use of media in society (UNESCO, 2023).

Theoretical Framework

The theoretical framework of this study is based on the Uses and Gratifications Theory of the 1970s. The formation of the theoretical framework dates back to the 1970s. The theory became systematic with the article published by the well-known psychologist Elihu Katz in 1974 (Büyükbaykal and Temel, 2019). By starting a discussion in 1970, Elihu Katz stated that instead of focusing on the question "what does media do to people?", they focused on the question "what do people do with media?" (Aslan, 2019). The theoretical framework, by focusing on the individual, argues that people have social and psychological needs and that, in line with these needs, they are active individuals who meet their needs by using media content. However, this situation sometimes produces undesirable results (Yaylagül, 2006).

The "Two-Step Flow of Communication" was conducted in the 1940s by Paul F. Lazarsfeld, Bernard Berelson, and Hazal Guadet, and was later examined by Katz and Lazarsfeld. In the Two-Step Flow of Communication research, they explained that media content does not have a direct effect, and they clarified that the main effect occurs through the personal networks used by audiences and through how they criticize media content by means

of opinion leaders. In this context, individuals who comment on daily life and events and guide others have an important role. Therefore, together with this approach, the foundation of the concepts of passive and active audience was laid in the 1940s, and at this point it was concluded that audience behaviors are not uniform (Hepp, 2019).

In the Uses and Gratifications Theory, Katz explains individuals' use of media as follows: audiences are active individuals, media use is need-based, media is not the only source for meeting individuals' needs, and audiences evaluate media effects with awareness. Therefore, according to this theory, audiences are active individuals and make choices in line with their own needs; their use of media is connected to the need for entertainment and obtaining information. On the other hand, audiences evaluate why they use media content and its effects (Luo, 2020).

In the Uses and Gratifications approach developed under the leadership of Elihu Katz, Katz states that there are fundamental needs that motivate individuals in media use. These are categorized under five main headings as cognitive needs, emotional needs, personal integrative needs, social integrative needs, and tension release needs (Küçükkurt, Hazar, Çetin, and Topbaş, 2009).

Cognitive Development Need: It was developed by Jean Piaget. Cognitive development is the need that an individual feels in order to understand and learn everything that he or she is curious about in his or her environment and to develop mental skills in this process. This need forms a unity with the sense of curiosity. For example, a university student who researches the accuracy of a news item seen on social media reaches other sources, makes comparisons, and criticizes it. Therefore, the student's cognitive development need is met through social media (Kayacı, 2019).
Emotional Needs: It is the need for individuals to develop a healthy self in order to exist in social life. According to Arslan (2024), it is the ability of a university student to make critical comments by showing emotional reactions such as sadness and happiness to the content he or she sees on social media.

Personal Integrative Need: It is expressed as the respect that individuals show towards their own emotional state. It is the need to respect the necessity of correctly understanding and accepting one's own emotional state (Cüceloğlu, 2006).

Social Integrative Need: Human beings are social beings. The first place where they socialize is the family. Therefore, it is expressed as a person establishing a bond with the group in which he or she lives, in other words with society, and living in harmony within social relationships (Berry, 2016).

Tension Release Need: Also known as experiential avoidance, the individual moves away from negative experiences that disturb him or her. For example, situations such as a false news spread by the media causing a person to distance himself or herself from the media express the need for tension release (Başlamış, 2022). Based on these basic characteristics, it creates a wide area for encouraging individuals to use media content and for analyzing the effects of these incentives on the behaviors they exhibit. This research is based on the assumption in the Uses and Gratifications approach developed especially by Katz, which explains why individuals use media. The first of these is that the audience consists of active individuals, and the second is individuals' awareness in media use. In this context, the theory emphasizes that active audiences make their own choices in selecting media content, and on the other hand, that individuals are aware of the purposes for which they consume media content (Yaylagül, 2006). Therefore, according to this theory, audiences are active individuals and make choices in line with their own needs; their use of media is attributed to the need for entertainment and obtaining information. On the other hand, audiences evaluate why they use media content and its effects (Luo, 2020). This research has examined the effect of media literacy on passive audiences within the framework of the Faculty of Communication and has been used to reveal students' media literacy levels and passive audience tendencies. On the other hand, other conceptual assumptions mentioned in the theory address students' orientations towards and evaluations of media content. In this context, with digitalization, media environments and content have diversified, and students' ability to access information has increased rapidly. Therefore, as a result of needs such as entertainment, information, social integration, and tension release that motivate students to use media, they tend towards media. Thus, students' displaying conscious behavior rather than passive behavior towards media content emerges as an important factor (Hepp, 2019; Karaduman, 2019). As a result, the Uses and Gratifications Theory is important in terms of helping to understand students' conscious selection of media content and their consumption behaviors. Therefore, this theory is suitable for explaining passive audience tendencies in media.

literature review

This literature review has addressed the effect of media literacy on passive audience behaviors from various perspectives and has revealed the trends, findings, and gaps in the existing literature. Ten scientific articles and studies published in scientific journals related to the subject were examined in detail.

The first is the study conducted by Geçer and Bağcı (2018). This study aims to examine in depth the effects of media literacy education on students of Sakarya University Faculty of Communication. The research especially focuses on understanding the effects of communication students' skills such as critical news analysis, content questioning, information verification, and evaluating news sources on behavior towards media content. The study also aims to show which factors shape the interpretation processes of the content obtained from media by communication students and how media usage habits transform into a conscious media user.

According to the results of the research, it has been shown that media literacy education among communication faculty students creates a conscious transformation in the ways of evaluating media content. In particular, it has been determined that students analyze media messages in an interrogative manner, at the same time measure the accuracy of news by comparing them with multiple sources and therefore strengthen their evaluation skills against manipulative media content. In addition, with the increase in media literacy level, it has been determined that there is a positive relationship with content analysis, accurate evaluation, and consumer attitudes.

The basis of this study directly constitutes a foundation for our study that examines the effect of media literacy on passive audiences. The research reveals the effect of media literacy on evaluation and questioning processes and guides passive audience behavior.

The second study is conducted by Yiğiter and Ata (2022). This study aims to examine how the levels of digital media literacy of students studying at Hatay Mustafa Kemal University Faculty of Communication and Antakya Vocational School, which is also included in the research, differ according to the demographic characteristics of the students. The study aims to determine how the digital media literacy levels of communication students are shaped and also aims to analyze their media usage habits and skill levels. In the research, the relationship between students' gender, income, education level, place of residence, and daily usage time variables and media literacy was analyzed. Therefore, in this context, the digital media literacy levels of different groups were compared. In the study, especially students' habits of using digital media content and the contribution of these habits to critical thinking skills and their ability to produce digital content were analyzed.

According to the research findings, it was found that communication students' level of criticism is active in evaluating the media content they consume on digital platforms and that it also improves their functional usage skills. In addition, differences were observed according to the education level of the students, and it was determined that associate degree communication faculty students scored higher than undergraduate students in the dimensions of functional production, critical consumption, and functional production. According to the research findings, geographical region and gender do not affect digital media literacy.

The basis of this study constitutes a direct foundation in terms of literacy effects in the field of digital media for our study, which examines the effects of media literacy on passive audiences. The research provides an important contribution to our study by revealing how the digital media literacy levels of communication faculty undergraduate and associate degree students affect their media usage patterns, their awareness of media messages, and their attitudes towards media. The study is important due to the transformation from passive to active audience.

The third study was conducted by Bozkurt (2012). This study aimed to examine in detail the effect of media literacy education on primary school students' perspectives on media content. In the study, within the context of the media literacy course, an attempt was made to understand how primary school students' abilities to perceive media and identify the content presented by media were affected by approaching media messages with a critical eye. The study aimed to explore how students interpret media functions through media literacy education. In particular, by examining the level at which students notice the structural elements of media content, the transformation in critical thinking skills and media use habits related to media content was examined.

According to the findings of the study, media literacy education was shown to be effective in increasing primary school students' level of awareness toward media content. In particular, it was determined that media literacy education gave students a critical perspective toward media messages. In the study, it was stated that the course content of media literacy education was reflected in students' evaluation of media content and messages. In

addition, it was observed that media literacy education positively affected and improved the level of attention and importance that students gave to the news and educational functions of media content.

This study constitutes a direct foundational source for our study examining the effect of media literacy on passive audiences. The research findings clarify how media literacy education transforms students' critical analysis, awareness, and evaluation skills regarding media content. These skills show that there is a parallel relationship between the ability to analyze media content and the ability to consume it consciously. In this context, it has critical importance for understanding the effect of media literacy on students' attitudes and behaviors.

The fourth study is conducted by Özgür and Eskicumalı (2023). This article aims to conduct a bibliometric analysis of postgraduate theses on media literacy in the field of communication sciences in Türkiye. This study aims to understand which academic approaches were preferred in theses produced on the subject of media literacy in the historical process, which methods were used in the theses, which theoretical approaches were used, and how they affected measurement tools. The research aims to analyze the themes around which the media literacy theses examined are concentrated. On the other hand, by examining the content intensity of theses studied at different universities in the field of communication sciences, it provides critical information about the development process of the field.

According to the research findings, it was observed that the number of theses in the field of media literacy increased significantly, especially between 2015 and 2019. In particular, it was concluded that academic interest in the field of media literacy intensified and strengthened between 2015 and 2019. The frequent use of qualitative methods in the research showed that the most commonly used method in master's and doctoral theses is the qualitative method. In this context, it was stated that survey, interview, and content analysis techniques are widely used among data collection techniques. On the other hand, the increasing frequency of the use of scales aimed at measuring media literacy levels, such as the Media Literacy Level Determination Scale and the New Media Literacy Scale, shows a tendency towards quantitative measurement tools. In addition, the research findings revealed that there is a positive relationship among the most frequently repeated concepts in media literacy theses, such as news, children, culture, and traditional.

The study conducted by Özgür and Eskicumalı (2023) constitutes the main basis of this research as it addresses media literacy theses within a comprehensive framework. The methods, themes, and approaches used in the theses studied in the field of media literacy provide an important framework for understanding passive and active audience groups in the field of communication.

The fifth study is conducted by Barut and Tuğtekin (2021). The main purpose of this study is to conduct a rigorous evaluation of university students' new media literacy levels. The study analyzes and identifies students' consumption and production skills while using new media environments and focuses particularly on the dimensions of functional consumption, critical consumption, functional production, and functional production. The study explains students' media usage habits and their attitudes and behaviors towards media content and shows how these are shaped throughout university life. At the same time, the study aims to address the differences revealed by new media literacy levels in line with students being intertwined with media and the interaction that emerges as a result.

According to the research findings, in general, the scale results show that students' new media literacy levels are strong in terms of critical perspective towards media content, but weak in terms of production-oriented skills. In particular, it is determined that many students exhibit the phenomenon of critical consumption towards media content and, on the other hand, the phenomenon of production. Another notable attitude of students in the research is that, due to the low level of trust in media content, the number of those who filter the consumed information through a critical perspective is high, whereas students who trust media content have a low tendency to evaluate information from a critical perspective. In the research, it is observed that students' frequent watching of television is related to critical consumption; in terms of internet usage frequency, it is seen that their critical and functional skills diverge.

This study conducted by Barut and Tuğtekin (2021) provides a critical basis for understanding students' new media literacy skills. The findings show that students' behaviors on social media platforms are related to various reasons. The study contributes to the research in terms of digital trust and criticism.

The sixth study is conducted by Ata and Karakuyu (2021). This research aims to examine the effect of new media literacy levels on university students within the framework of a quantitative research approach. The research aims

to reveal how students analyze new media content, their usage habits, and the differences in content evaluation in the context of demographic variables (such as gender, social network, school type, program type, etc.). The study aims to examine in detail the factors that shape university students' positions on new media platforms and the relationships established in digital environments from beginning to end. The research provides critical contributions in terms of determining how university students' new media literacy levels in digital environments shape their participation processes.

According to the findings of the research, it was concluded that university students' new media literacy levels are high in general. In particular, it was determined that the increase in the number of social network usage contributes to strengthening new media literacy. When the obtained results were examined, it was seen that male students have statistically significantly higher new media literacy levels than female students. On the other hand, it was observed that students studying in faculties show higher literacy levels compared to students studying in vocational schools. It was determined that students studying in social programs are in a more advantageous position than students in other programs (technical and health). This situation indicates that there is a positive relationship between students and new media literacy.

The basis of this study constitutes an important foundation for our research, which examines the interaction of students' new media literacy on social networks. The research provides clarity and a critical contribution to our field by showing that new media literacy levels differ according to demographic variables. In particular, the increasing effect of students' use of social networks provides a guiding basis for our study.

The seventh study was conducted by Ateşgöz (2023). This study examined students' news media literacy levels within the framework of Çukurova University undergraduate students and at the same time aimed to examine in depth the variables affecting these levels. This research focused on how students' self-efficacy and critical performance levels within the scope of news media literacy could shape the way they interpret news content and at the same time the way they evaluate news sources critically. On the other hand, the study presents basic findings regarding what kind of change the news-following platforms preferred and used by students create in their news literacy levels.

According to the findings of the study conducted by Ateşgöz (2023), it was determined that Çukurova University undergraduate students' news media literacy levels were generally at a moderate level, while students' self-efficacy and critical performance levels were low. In the research, it was stated that the faculty variable and the digital media publications chosen by students for following news created a significant level of differentiation in trust perception, selectivity, and finally accuracy orientation regarding news literacy. In addition, it was observed that platforms such as Telegram, Twitter, and YouTube preferred by students were associated with a high level of literacy in access to information, whereas this level remained low on news sites such as Instagram and similar platforms. In addition, it shows that the faculty in which education is received at Çukurova University positively affects news media literacy.

The basis of this study constitutes a direct foundation for our study examining the effects of media literacy on passive audiences. The research makes an important contribution by explaining which variables of news media literacy affect students' critical attitudes and behaviors towards news content. In particular, the effect of critical attitudes and self-efficacy performance levels provides guidance in terms of passive and active audiences.

The eighth study is conducted by Yaşa and Şen (2024). The study conducted by Yaşa and Şen aims to examine theoretically the concepts of speed, prosumer behavior, and infinite scrolling, which enable the formation of social media culture, in terms of their effects on user experiences and their connection with cultural transformation. The research attempts to understand how the concepts of speed, prosumer behavior, and infinite scrolling, which users encounter on social media platforms, affect user behaviors in interpreting digital culture. In this context, the study aims to learn how the concept of speed shapes content consumption behaviors and, on the other hand, how the concept of prosumer, which means producer and consumer, positions individuals.

The research findings reveal that users defined as prosumers in social media environments take an active role as individuals who both produce and consume content in the prosumer position. Therefore, it has been determined that this situation affects the critical approach to social media culture as a new phenomenon in consuming and producing social media content. On the other hand, it has been observed that infinite scrolling behavior, which affects user behavior, leads to digital addiction and attention deficiency by increasing the time that producers and consumers spend on the platform. In addition, it has been concluded that there is a positive relationship among these concepts affecting user behavior and that they transform social media culture.

The study conducted by Yaşa and Şen (2024) establishes a theoretical framework by addressing social media culture in the context of three concepts that affect and transform user behavior. It attributes critical importance to guiding user behaviors and affecting many experiences such as infinite scrolling behavior within social media culture. In particular, it has been determined that social media culture creates an identity by positioning users as producers and consumers. In this context, the study of Yaşa and Şen (2024) has a guiding quality for our research questions within the context of active and passive audience.

The ninth study was conducted by Dursun and İlhan (2021). This study aims to examine in depth the passive–active audience profiles of daytime television programs by addressing social media. The research addresses how traditional media audiences in a passive audience position move into an active role with new digital media and aims to evaluate in detail the expressions produced by users in social media environments within the scope of critical discourse analysis. The study aims to conduct a detailed examination in order to understand the comments obtained through the Instagram accounts of the daytime programs followed by users, the interpretation of the audience's comments on program content, which discourse patterns are used while making this interpretation through feedback, and how the text–audience interaction is shaped. Therefore, this study aims to analyze the effect of daytime television programs on audiences through the method of critical discourse analysis and at the same time to analyze the transformation of audience behaviors on social media platforms.

According to the research findings, it has been shown that the posts made on social media platforms affect the perceptions of the audience towards daytime television programs to a remarkable degree. In particular, it has been determined that, as a result of the active participation of audiences in Instagram comments on the social media accounts of daytime programs, they use various discourse strategies while producing comments and reinterpreting program content. In the study, it has been determined that the comments made by audiences generally reflect emotional, ideological, and cultural codes. In addition, it has been shown that active audience comments have a positive effect in interaction with new digital media.

This study constitutes a direct basis for our research examining the effect of media literacy on passive audiences. The research makes an important contribution by addressing active audience comments on social media in terms of the passive–active relationship.

The final study was conducted by Konuk and Güntaş (2019). The article studied by Konuk and Güntaş aims to conduct a comprehensive research on the relationship between social media platforms and education on two main axes. The research process was addressed within the context of consuming all media tools for educational purposes and the effect of this use on educational processes. The study by Konuk and Güntaş (2019) presents an in-depth theoretical framework aimed at analyzing which factors cause changes in individuals' communication processes, interactions, and learning behaviors in the digital age. In addition, the effects on children, adolescents, and adults who are social media users were examined in detail.

According to the research findings, it was shown that social media literacy has a positive contribution to educational processes. In particular, it was observed that the active use of social media platforms provides a significant contribution from information sharing to student participation and learning motivation. In the study, students' ability to easily access course schedules, access course content, and communicate with their peers through social media showed a positive interaction with the learning process. In addition, a statistically significant positive relationship was found between the frequency of individuals' use of social media platforms and their learning experiences.

The basis of this study provides a direct and important foundation for our research examining the effect of media literacy on passive audiences. The research explains that individuals who use social media platforms consume the content they obtain from media by questioning it and, in this context, explains the effect of active social media use on learning. The study is closely related to the process of transforming the passive audience phenomenon, which our study focuses on, into the phenomenon of active audience and consumer in terms of consuming information obtained from social media platforms in a more conscious manner. In this context, it serves as an important reference for our research questions regarding active audience, passive audience, and critical approach.

Method

This study was prepared based on a quantitative research approach in order to examine the relationships between the media literacy levels of undergraduate students studying at Sakarya University Faculty of Communication and their passive audience behaviors. Quantitative research, which proceeds with a deductive approach, is based on the assumption that reality can be explained through measurable and numerical data, and therefore it is a research approach that is based on collecting data in an objective, systematic, and repeatable manner. Therefore, in

quantitative research, the relationships and differences between variables can be analyzed using statistical methods, and generalizable results can be obtained through the findings, and at the same time, it is aimed to make predictions regarding future attitudes (Garip, 2025). In this context, the quantitative research approach, which proceeds with a deductive logic, offers a method that is directly compatible with the sub-problem statement and sub-problems of the research. The relational survey model, which dominates the research framework, is a quantitative research model that provides the opportunity to examine in detail the relationship between variables without any intervention in the existing situation (Bekman, 2022). Through this model, the relationship between the media literacy levels and passive audience behaviors of students studying in different fields at the Faculty of Communication can be analyzed through quantitative statistical data. The theoretical framework of the research is formed within the scope of audience studies and media literacy literature. Media literacy refers to the ability to interpret, which highlights the critical perspective and evaluation process that individuals display towards all auditory or written media content (Karaboğa, 2017). The concept of passive audience, on the other hand, is explained as the behavior patterns of individuals who accept the information they obtain from social media content without verifying its accuracy, in other words, who accept media messages as true as they are presented without questioning them and consume them without critically analyzing them (Bayraktar, 2022).

The media literacy literature and audience studies addressed in this study provide a theoretical foundation and are based on the assumption that an increase in the level of media literacy may reduce passive audience behaviors. Within this scope, the variables addressed in the research are presented below.

Independent Variable
Media Literacy Level
Media literacy is generally defined as the ability of individuals to evaluate, in a questioning manner and with a critical approach, the accuracy of the information they obtain from social media tools that meet their need for information, and in this context, to consume it consciously. Therefore, it is stated that individuals with a high level of media literacy develop a more questioning attitude by distinguishing themselves from individuals who display passive behavior towards media content (Karaman and Karataş, 2009). In this section of the research, media literacy is expressed through four sub-dimensions in terms of the interaction that students establish with media content. These are functional consumption, critical consumption, functional production, and critical production.

Dependent Variable
Passive Audience Behaviors
Passive audience behaviors are defined as individuals accepting information learned from social media content, the accuracy of which is unknown, without questioning; consuming media messages without passing them through a critical filter and without analyzing them; and accordingly displaying a passive attitude towards media (Bayraktar, 2022; Avşar, 2013). The effect of media literacy on passive audiences in the literature reveals that passive audience behaviors are in a significant relationship with media literacy. It is emphasized that individuals with low levels of media literacy display passive audience behavior and that this is significantly associated with the low level of media literacy (Bayraktar, 2022).

The effect of media literacy on passive audiences within the scope of this study was calculated through low scores obtained in the critical consumption dimension of passive audience behaviors, and on the other hand, it was evaluated indirectly in line with attitudes towards accepting media messages directly without questioning. Within the scope of the research, it was concluded that the appropriate model consists of dependent and independent variables, and it aims to examine the effect of individuals' media literacy levels on passive audience behaviors in a relational context. In this direction, the research adds a new dimension to how media literacy skills shape the audience positions in which individuals are situated towards media content and at the same time guides the fields of media, communication, and literacy by contributing to the literature.

Problem Statement
"How do the media literacy levels of Sakarya University Faculty of Communication students affect passive audience behaviors?"

Sub-Problems and Hypotheses
Sub-Problem 1: What are the media literacy levels of Sakarya University Faculty of Communication students?

- H1: Students' media literacy levels are at a moderate and above level.
- H01: Students' media literacy levels are at a low level.

Sub-Problem 2: What is the level of passive audience tendencies of Sakarya University Faculty of Communication students?

- H2: Students' passive audience tendencies are at a low level.
- H02: Students' passive audience tendencies are at a high level.

Sub-Problem 3: Is there a significant relationship between media literacy level and the indicators representing passive audience behaviors?

- H3: There is a negative and significant relationship between media literacy level and the indicators representing passive audience behaviors.
- H03: There is no significant relationship between media literacy level and the indicators representing passive audience behaviors.

Sub-Problem 4: Do media literacy levels differ according to students' demographic variables?

- H4: Media literacy levels show significant differences according to demographic variables.
- H04: Media literacy levels do not show significant differences according to demographic variables.

Research Model

Within the framework of the research, the relational survey method was used to examine the relationship between communication students' media literacy levels and passive audience tendencies within the scope of the effect of media literacy on passive audiences. The relational survey model is defined as a quantitative research survey approach that enables the analysis of the existence of both directional and non-directional relationships and thus allows determining their level (Bahtiyar and Can, 2016). In this context, the effect of the independent variables determined within the research framework on students' passive audience behaviors was tested statistically.

In the research model, the relationship between students' levels of analyzing, questioning, and evaluating media content and their passive audience tendencies was addressed. In the dependent variable, students' passive attitudes towards media, their level of questioning approach to content, and passive audience behaviors were addressed. Within the scope of the research, the descriptive survey model was also used. The purpose of using this model within the scope of the research is to present students' media content consumption behaviors, media usage habits, and general media literacy profiles of Sakarya University Faculty of Communication students. Thus, the descriptive findings used in the research also contributed to interpreting the relational analyses in a more meaningful and holistic manner. In this context, the research models used within the scope of the study aim to determine the effect of media literacy levels on passive audience behaviors, to identify students' levels of critical awareness towards media content, and at the same time to explain their attitudes towards media. Through this model developed within the scope of the research, the role of students' media literacy levels in positioning them as passive or active audiences will be analyzed objectively.

Population

The population of this study consists of students from different classes and fields studying at Sakarya University Faculty of Communication. The departments within the Faculty of Communication are listed as follows: Public Relations and Advertising, Journalism, Radio, Television and Cinema, and New Media and Communication. Students of Sakarya University Faculty of Communication represent a group in which active and passive audience behaviors can be clearly observed, as they spend time intertwined with media due to their field and are involved in an intensive interaction process with media and digital platforms.

In addition, since Faculty of Communication students follow media closely both as individual users and as future professional communicators due to the nature of their education, an appropriate population selection was made in line with the purpose of the research. Sakarya University Faculty of Communication students include all students studying in the 1st, 2nd, 3rd, and 4th years in the 2025–2026 Academic Year. The research aims to reveal the relationship between communication faculty students' tendencies to be in a passive or active position towards media content produced in media.

Sample

Within the scope of the study titled "The Effect of Media Literacy on Passive Audiences: The Case of Sakarya University Faculty of Communication," the sample was selected from undergraduate students of Sakarya University Faculty of Communication aged between 18 and 30. In the sample selection, the convenience sampling method was used so that the researcher could access the target group quickly and carry out the application process in a practical manner. It is one of the preferred sampling techniques as it allows rapid and practical access to data. In this direction, a total of 100 undergraduate students from four different departments studying at Sakarya University Faculty of Communication were included in the research.

However, after excluding incomplete forms, statistical analyses were conducted on 96 valid participants. The sample size was determined by taking into account time, cost, and access conditions. The convenience sampling method used with the determined sample is considered appropriate in terms of representing the frequency of use of media tools by Faculty of Communication students and their passive/active attitudes towards media messages. At the same time, including undergraduate students from four different departments and class levels increases data diversity and contributes to the reliability of the analysis results. The fact that the 100 students included in the research actively consume media content strengthens the suitability of the sample in line with the purpose of the study.

Data Collection Tool

Within the scope of this research, data were collected from undergraduate students of Sakarya University Faculty of Communication using a face-to-face survey technique. The data collection instrument used in the research consists of two main sections. The survey was prepared in a semi-structured form and arranged in accordance with the quantitative research approach.

In the first part of the survey, questions were included to determine the participants' demographic information such as gender, age, class level, daily internet usage time, and frequency of social media use. The purpose of including this section in the survey form is to define the participant profile and to evaluate it descriptively based on the obtained data.

In the second part of the survey, the Media Literacy Scale developed by Karaman and Karataş (2009), for which validity and reliability studies have been conducted, was used to measure the media literacy levels of the participants. The scale items consist of four sub-dimensions: functional consumption, critical consumption, functional production, and critical production. The items in the scale aim to reveal and demonstrate the participants' competencies in questioning the reality of media content, in other words media messages, evaluating them, and producing them.

Since there is no scale in the literature to measure passive audience behaviors within the scope of the research, students' passive audience behaviors were evaluated indirectly by measuring them through their media literacy levels. Based on this, students' passive audience status was addressed in line with accepting media content without questioning, low levels of critical consumption, and passive audience indicators discussed in the literature. Since passive audience behaviors in the literature are associated with low levels of media literacy, this appears as an accepted approach. In the analysis of the data obtained in the research, the significance level in statistical analysis was accepted as 0.05. In the analyses conducted, if $p < 0.05$, the results were considered statistically significant. In this direction, the aim of the research, together with the data collection tool, is to measure media literacy levels and passive/active audience tendencies in a valid and reliable manner.

Data Analysis

The data obtained in the focus of the research were analyzed using the SPSS 27.0 package program. In the analysis process, first, missing data control was conducted in order to ensure the suitability of the dataset for analysis, and the normality of the data distribution was examined. The assumption of normal distribution was evaluated by taking into account skewness and kurtosis values and the results of the Kolmogorov-Smirnov test. In line with the fulfillment of the normal distribution assumption, it was decided to apply parametric tests.

Descriptive statistics were used in the examination of the demographic variables and media usage characteristics of the participants; the data were summarized by calculating frequency (f), percentage (%), arithmetic mean ($\bar{X}$), and standard deviation (SD).

In order to determine the reliability of the media literacy scale used in the research, the Cronbach Alpha coefficient was calculated, and values of 0.70 and above were evaluated as indicating that the scale is reliable. Another analysis used in the research, Pearson Correlation Analysis, was used to determine the direction of relationships. Passive audience behaviors were not measured directly, but were evaluated indirectly through the low scores obtained especially in the critical consumption dimension of the media literacy scale. In this direction, the correlation analyses conducted aim to reveal the relationships between media literacy level and the indicators representing passive audience behaviors.

In order to examine whether there are significant differences according to the demographic variables of the participants, the independent samples t-test and One-Way Analysis of Variance (ANOVA) were used. In all statistical analyses, the significance level was accepted as $p < 0.05$, and the findings obtained were interpreted in this direction.

Assumptions

In this research, the following assumptions were taken into consideration:

It is assumed that the participants answered the survey form correctly and honestly. In face-to-face survey techniques, it is accepted as a data collection process that participants' statements reflect the truth and, at the same time, since there is direct interaction between the researcher and the participant, missing or incorrect responses are noticed and corrected by the researcher and the participant (Küçükkambak and Armağan, 2022).

The validity and reliability of Karaman and Karataş (2009) are accepted. The inclusion of the Media Literacy Scale used in the research in previous validity and reliability studies in the literature shows that the measurement tool is suitable for measuring students' media literacy levels within the scope of the research. The media literacy scale used in the research is assumed to measure the intended variable correctly.

It is assumed that the sample represents the population. It is accepted that the sample included in the research has the capacity to represent the population of the research. This assumption constitutes a basis for interpreting the results obtained from the research in relation to the population (Balcı, 2015).

It is assumed that participation in the research is entirely based on voluntariness and that it was conducted in accordance with ethical principles. Within the scope of the research, it is accepted that participants were informed about the informed consent form presented by the ethics committee and that their informed consent was obtained (Esmer and Özdaşlı, 2023).

It is assumed that the internal consistency levels of the scales meet the reliability criteria. In the research, if the Cronbach Alpha coefficient is found to be 0.7 and above, the reliability result of the scale is accepted as good (Kılıç, 2016).

Assumptions

Within the scope of this research, it has been verified that some statistical and methodological assumptions are met. These assumptions indicate that the analyses to be applied through the research function properly, in other words, correctly. It is observed that they directly affect the validity and reliability of the findings obtained from the data. In this context, the research is explained below within a theoretical framework (Baltacı, 2018).

It is assumed that the data show a normal distribution. The fact that the media literacy and passive audience behavior scores obtained from Sakarya University Faculty of Communication students are close to a normal distribution is important for the use of parametric tests. Therefore, ensuring normality strengthens the interpretation process carried out through correlation and regression analyses (Uysal and Kılıç, 2022).

It is assumed that there is a linear relationship between the variables. By accepting that the relationship between media literacy level and passive audience behaviors is linear, it is tested based on the effect between the variables. In this context, this assumption is considered fundamental for relational analyses to produce meaningful results (Garip, 2023).

It is accepted that the assumption of homogeneity of variance is met. In comparing participants' media literacy and passive audience behaviors according to demographic variables, it is assumed that the variances between groups are equal. This situation ensures that group comparisons are statistically more reliable (Garip, 2023).

It is assumed that there is no problem of multicollinearity. It is accepted that there is no excessive relationship between the media literacy sub-dimensions and the variables included in the model. In this context, it is assumed that the relationship between variables is not at a level that would distort the analysis results (Kılıç, 2016).

It is assumed that the measurements have interval properties. Accepting the scores obtained from Likert-type scale items used in the research as equally spaced is a common approach in social sciences. This acceptance makes it possible to statistically analyze the level of directly questioning media content (Turan, Şimşek and Aslan, 2015).

It is assumed that the data consist of independent observations. It is accepted that the participants answered the questionnaire only once and that the responses did not affect each other. Therefore, the observations in the dataset are independent, and the analyses are carried out based on this assumption (Yazıcıoğlu, 1994).

It is assumed that sampling errors are at a controllable level. It is concluded that the sample reached in the research is sufficient to represent Sakarya University Faculty of Communication students. All of these assumptions are important in terms of correctly testing the relationship between media literacy and passive audience behaviors. A serious violation of these assumptions may lead to an incorrect interpretation process of the analysis results (Demir, Çelik and Urlu, 2024).

Limitations

This research includes various methodological and application-related limitations. First of all, the research was conducted only with undergraduate students studying in different fields and classes at Sakarya University Faculty of Communication. It is not possible to generalize the data to student groups from any other university, faculty, or different department. The fact that the sample selection in social sciences is limited to a specific institution and academic field is a situation that limits the external validity of the research (Baltacı, 2018). In this context, the research findings are interpreted within the scope of Sakarya University Faculty of Communication students, which constitutes the population of the study.

In the research, data were collected only through a quantitative research method. Within the scope of the study, this situation limits in-depth interpretation in the analysis of the relationship between media literacy levels and passive audience behaviors and in contextual dimensions. In this context, while quantitative research helps to reveal the relationships between variables statistically, it does not include data regarding participants' personal experiences and subjective approaches (Garip, 2023). Since there is no scale in the literature to measure passive audience behaviors within the scope of the research, students' passive audience behaviors were measured through a self-report-based measurement tool using the media literacy scale, and passive audience behavior was not observed directly. In this context, the data obtained are based on participants' perceptions and evaluations rather than behavioral outcomes.

In the data collection process, surveys were applied to 100 undergraduate students studying in different departments at Sakarya University Faculty of Communication, and this method provides an important advantage in increasing the participation rate and enabling the problems to be interpreted and answered more clearly (Küçükkambak and Armağan, 2022). The fact that the measurement tools are also based on self-report may cause participant responses to be shaped by individual perceptions. On the other hand, the limitation of the data collection process to a specific time period, together with the fact that participants' media usage habits and digital media environments may change over time, limits long-term generalizability through the analysis results obtained (Demir, Çelik and Urlu, 2024).

Finally, the fact that the research was conducted with a limited number of undergraduate students at Sakarya University Faculty of Communication causes the statistical power to remain limited when compared to studies conducted with larger samples, and the findings obtained should be evaluated within the scope and limitations of the research and handled carefully (Demir, Çelik and Urlu, 2024).

Definitions

The concepts included in this research are explained below:

Communication: Communication is defined as the process by which one or more individuals share their feelings and thoughts or information about events such as culture, art, economy, and sports occurring in the world or in the country through various mass media tools, and at the same time establish relationships with others. Communication is not one-way (Ulusoy, 2012).

Digital Media: In today's digitalization process, communication among people, rapid access to information, and convenience have led to fundamental changes in forms of interaction. The first step of digitalization began with the invention of the printing press, which enabled the emergence of newspapers, and this process was later followed by the establishment of radio and television. Thus, mass media have transformed into a systematic structure that can reach large audiences in social life through the internet and have led to significant developments (Erişti, 2018). Digital transformation, although a fundamental concept, is a concept that has emerged in direct proportion to the development of technology in the business processes of various institutions in order to obtain value over time (Baş, Erdoğan Tarakçı and Aslan, 2022, p. 9).

Passive Audience and Active Audience: The concept of audience has undergone many changes and transformations from past to present. In the historical period, audiences first came to the fore with the concept of the "reading public," and later were evaluated as passive receivers in the one-way communication structure that developed with radio and television (Avşar, 2013). Media literacy is an important tool that enables audiences to approach media content with a questioning perspective and to evaluate it in the digital age (Avşar, 2013; Koçoğlu, 2023). Therefore, media literacy not only transforms students into active participants in the production and consumption of digital media, but also enables audiences or individuals to evaluate media content in a questioning manner through the conscious attitudes they display (Avşar, 2013).

Media Literacy: With the development of digital technologies and the internet in the late 20th century, students and adults have evolved from content consumers to content producers (Güneş, 2013; Koçoğlu, 2023). These

developments have made media literacy a critical concept. Media literacy contributes to individuals' ability to critically evaluate media messages and to question the accuracy of information. While passive audience behavior increases the risk of exposure to misinformation, media literacy, on the contrary, reduces this risk and enables individuals to use media actively and critically (Kartal and Kıncal, 2009).

Findings

In the findings section, the statistical analysis results of the data obtained from Sakarya University Faculty of Communication students in the article titled "The Effect of Media Literacy on Passive Audiences: Sakarya University Faculty of Communication Example" are discussed. The research findings first address the demographic characteristics of the participants, and then present students' media usage habits, students' media literacy levels, and finally the indicators representing students' passive audience behaviors.

At this point, based on the methods used within the scope of the research, descriptive statistics were first used to reveal the students' demographic characteristics (gender, age, class level, daily internet usage time, and frequency of social media use) and media usage habits. Accordingly, through the data obtained within the scope of the research, frequency, percentage, arithmetic mean, and standard deviation values were calculated.

In order to evaluate the measurement power of the Media Literacy Scale used in the research, the Cronbach Alpha internal consistency coefficient was examined. At this point, the reliability of the scale was tested. In addition, normal distribution analysis was conducted to determine the suitability of the dataset for parametric analyses. In order for normality to be met, skewness and kurtosis values and the results of the Kolmogorov–Smirnov test were taken into account.

The media literacy level and the indicators representing passive audience behaviors were evaluated through the scores obtained especially from the critical consumption dimension. Based on this, Pearson Correlation Analysis was applied to determine the direction and level of the relationship between the variables. In order to examine whether media literacy levels differ according to students' demographic variables, the independent samples t-test and One-Way Analysis of Variance (ANOVA) were included in the research.

In all statistical analyses, the significance level was accepted as $p < 0.05$, and the findings obtained were interpreted in this direction. The reliability of the Media Literacy Scale was evaluated with the Cronbach Alpha coefficient. At this point, the internal consistency value of the scale was calculated as $\alpha = 0.916$. According to the obtained research result, it indicates that the scale is highly reliable.

Frequency Interpretation

5. Frequency and Percentage Distributions of Participants' Demographic Characteristics

Table 1. Gender

Gender	**f**	**%**
Female	56	58,3
Male	39	40,6
Prefer not to say	1	1,0
Total	**96**	**100,0**

Source: *Created by the author.*

In Table 1 shown above, the section of demographic findings related to students is presented. In the findings section, the findings regarding gender, which is one of the demographic characteristics of the students participating in the research, are included. At this point, the findings are discussed in Table 1 above in terms of frequency (f) and percentage (%) values within the scope of the gender variable of the students. A total of 96 students participated in the research, of whom 58.3% (n=56) were female students, 40.6% (n=39) were male students, and 1.0% (n=1) was a student who preferred not to state their gender.

Table 2. Age

Age	f	%
Prefer not to say	1	1,0
18-20	53	55,2
21-23	38	39,6
24-26	3	3,1
27 and above	2	2,1
Total	**96**	**100,0**

Source: Created by the author.

According to Table 2, the age distributions of the participating students are included. When the data in Table 2 are examined, first, the total participation rate of students in the 18–20 age range is 55.2% (n=53). The rate of students in the 21–23 age range is 39.6% (n=38). The total participation rate of students in the 24–26 age group is 3.1% (n=3), and finally, the participation rate of students aged 27 and above is determined as 2.1% (n=2). From this point of view, when the age distributions of the participating students are examined, it is seen in the results of Table 2 that a large part of them are in the 18–20 age range.

Table 3. Class

Class	f	%
2nd year	66	68,8
3rd year	19	19,8
4th year	11	11,5
Total	**96**	**100,0**

Source: Created by the author.

In Table 3, the findings related to the class levels of the students participating in the survey are presented. When the distribution of class levels is examined on the basis of Table 3, it is indicated in the survey findings that 68.8% (n=66) are 2nd-year students, 19.8% (n=19) are 3rd-year students, and 11.5% (n=11) are 4th-year students.

Table 4. Daily Internet Usage Durations

	f	%
Less than 1 hour	1	1,0
1–3 hours	15	15,6
4-6 hours	48	50,0
7 hours and above	32	33,3
Total	**96**	**100,0**

Source: Created by the author.

In Table 4, the findings related to students' daily internet usage durations are presented in the table above. When the data regarding the daily internet usage durations of communication faculty students in Table 4 are evaluated, it is concluded that 50.0% (n=48), that is, half of the participants, have a daily internet usage duration of 4–6 hours. The proportion of students whose daily internet usage duration is 7 hours and above is 33.3% (n=32). The proportion of students who use the internet for 1–3 hours daily is determined as 15.6% (n=15). Finally, it is found that the proportion of students who use the internet for less than 1 hour daily is 1.0% (n=1).

Table 6. *"I can decide for myself whether the messages in mass media are true or false."*

Response	**f**	**%**
Strongly Disagree	2	2,1
Disagree	4	4,2
Neutral	24	25,0
Agree	40	41,7
Strongly Agree	26	27,1

Total	**96**	**100,0**

Source: Created by the author.

In Table 6, the distribution of the responses given by the participants to the statement "I can decide for myself whether the messages in mass media are true or false" is shown. When the findings in Table 6 are examined, it indicates that a large part of the participants agree positively with this statement. The total of the responses "Agree" (41.7%; n=40) and "Strongly Agree" (27.1%; n=26) reveals that students consider themselves sufficient in evaluating the accuracy of media messages. On the other hand, the fact that the proportion of participants who responded "Neutral" (25.0%; n=24) is at a remarkable level shows that some uncertainties continue to exist in the process of evaluating the accuracy of media messages.

Table 7. *"I am aware of the values such as consumer culture, violence, etc. produced by mass media."*

Response	**f**	**%**
Strongly Disagree	1	1,0
Disagree	1	1,0
Neutral	12	12,5
Agree	41	42,7
Strongly Agree	41	42,7
Toplam	**96**	**100,0**

Source: Created by the author.

In Table 7 above, the distribution of the responses given by the participants to the statement "I am aware of the values such as consumer culture, violence, etc. produced by mass media" is shown. When the findings given in Table 7 are examined, it is seen that a very large majority of the participants agree positively with this statement. The total of the results obtained from the response "Agree" (42.7%; n=41) and the result observed from the response "Strongly Agree" (42.7%; n=41) indicates that students have a high level of awareness in recognizing the values included in media content. The relatively low level of neutral responses (12.5%; n=12) shows that the number of students experiencing uncertainty on this issue is limited. The fact that negative responses are at very low rates indicates that participants are able to evaluate media messages with a critical perspective.

Table 8. *"I notice for what purposes (social responsibility, consumption, informing, entertaining, etc.) messages are created."*

Response	**f**	**%**
Strongly Disagree	1	1,0
Disagree	2	2,0
Neutral	10	10,4
Agree	42	43,8
Strongly Agree	41	42,7
Total	**96**	**100,0**

Source: Created by the author.

In line with the information presented in Table 8 above, the distribution of the responses given by the participants to the statement "I notice for what purposes (social responsibility, consumption, informing, entertaining, etc.) messages are created" is listed below. When the findings in Table 8 are examined, it is seen that a very large majority of the participants agree positively with this statement. The total of the responses "Agree" (43.8%; n=42) and "Strongly Agree" (42.7%; n=41) reveals that students have a high level of awareness in distinguishing the purposes behind media messages. The relatively low level of neutral responses (10.4%; n=10) indicates that the number of participants experiencing uncertainty on this issue is limited.

Table 9. *"I determine the positive and negative aspects of broadcasts in mass media."*

Response	**f**	**%**
Strongly Disagree	4	4,2
Disagree	3	3,1
Neutral	18	18,8
Agree	39	40,6
Strongly Agree	32	33,3
Total	**96**	**100,0**

Source: Created by the author.

In Table 9 above, the distribution of the responses given by the participants to the statement "I determine the positive and negative aspects of broadcasts in mass media" is shown. As seen in Table 9, when the findings are examined, it is seen that a large part of the participants responded positively to this statement. The total of the responses "Agree" (40.6%; n=39) and "Strongly Agree" (33.3%; n=32) reveals that students can distinguish the positive and negative aspects of media content by evaluating them with a critical perspective. On the other hand, the fact that the neutral responses (18.8%; n=18) are at a relatively remarkable level shows that some students may experience hesitation from time to time in evaluating media content. The low rates of the responses "Disagree" (3.1%; n=3) and "Strongly Disagree" (4.2%; n=4) reveal that the number of students who think that they do not have this skill is limited.

Table 10. *"I look at the messages given in mass media with a critical perspective."*

Response	**f**	**%**
Strongly Disagree	3	3,1
Disagree	7	7,3
Neutral	24	25,0
Agree	30	31,3
Strongly Agree	32	33,3
Total	**96**	**100,0**

Source: Created by the author.

In line with the information presented in Table 10 above, the attitudes of the participants towards checking the accuracy of media content through different sources are presented. The findings obtained show that an important part of the students adopt this behavior. In particular, the high rates of the options "Agree" (31.3%; n=30) and "Strongly Agree" (33.3%; n=32) indicate that the participants generally display a conscious approach in questioning and verifying media messages. The proportion of participants who reported neutrality (25.0%; n=24) is at a level that cannot be ignored. This situation indicates that the participants are not clear about checking the accuracy of media content.

Table 11. *"I have competence regarding how mass media affect individuals."*

Response	**f**	**%**
Strongly Disagree	2	2,1
Disagree	6	6,3
Neutral	19	19,8

Agree	41	42,7
Strongly Agree	28	29,2
Total	**96**	**100,0**

Source: Created by the author.

According to the information presented in Table 11 above, the majority of the participants consider themselves sufficient in evaluating the effects of mass media on individuals. While the proportion of those expressing a positive opinion draws attention with a total of 71.9% (n=69), the proportion of participants who remain neutral is at the level of 19.8% (n=19). The fact that negative opinions remain at a low rate (8.4%; n=8) shows that students' awareness in this field is generally high.

Table 12. ***"I notice that mass media have political, economic, cultural, and social priorities."***

Response	**f**	**%**
Strongly Disagree	1	1,0
Disagree	3	3,1
Neutral	16	16,7
Agree	42	43,8
Strongly Agree	34	35,4
Total	**96**	**100,0**

Source: Created by the author.

The findings stated in Table 12 above show that a large part of the participants notice that mass media have different social and structural priorities. The proportion of participants expressing a positive opinion is 79.2% (n=76) in total, and this situation indicates that students develop a critical and awareness-based perspective towards media content. The group of participants who are neutral at a rate of 16.7% (n=16) suggests that some students cannot make a clear evaluation regarding the directive structure of media tools. It shows that negative opinions (4.2%; n=4) remain at a very low level.

Table 13. *"I give positive and negative reactions to messages in mass media."*

Response	**f**	**%**
Strongly Disagree	1	1,0
Disagree	3	3,1
Neutral	16	16,7
Agree	42	43,8
Strongly Agree	34	35,4
Total	**96**	**100,0**

Source: Created by the author.

In Table 13 above, a large part of the participants stated that they can give positive or negative reactions to the messages presented in mass media. In particular, the high rates of the responses "Agree" (33.3%; n=32) and "Strongly Agree" (37.5%; n=36) indicate that students display an active approach in evaluating media messages and developing attitudes towards these messages. On the other hand, the fact that the proportion of neutral participants (16.7%; n=16) is at a considerable level suggests that some students cannot develop a clear attitude regarding the reactions they give to media messages. The fact that negative opinions remain at relatively low rates (12.5%) reveals that this skill is generally widespread among students.

Table 14. *"I make suggestions about protection from the negative aspects of broadcasts in mass media."*

Response	**f**	**%**
Strongly Disagree	5	5,2

Disagree	21	21,9
Neutral	29	30,2
Agree	26	27,1
Strongly Agree	15	15,6
Total	**96**	**100,0**

Source: Created by the author.

According to the information presented in Table 14 above, it is seen that the responses given by the participants, in other words the students of the Faculty of Communication, to the item "I make suggestions on protection from the negative aspects of broadcasts in mass media" do not concentrate around a specific opinion. The fact that the proportion of neutral participants has the highest value with 30.2% (n=29) shows that students cannot display a clear attitude in developing suggestions for protection from negative content in mass media. While the proportion of those expressing a positive opinion is 42.7% (n=41) in total, the total proportion of negative opinions is at the level of 27.1% (n=26). This distribution reveals that although a part of the students consider themselves sufficient in this regard, a significant portion either remain neutral or think that they do not have this competence.

Table 15. *"I know that the given messages are created in different forms in different mass media."*

Response	**f**	**%**
Disagree	6	6,3
Neutral	26	27,1
Agree	33	34,4
Strongly Agree	31	32,3
Total	**96**	**100,0**

Source: Created by the author.

In line with the information presented in Table 15, an important part of the participants express that they are aware that the given messages are produced in different forms in different mass media. The total of the responses "Agree" (34.4%; n=33) and "Strongly Agree" (32.3%; n=31) reaching 66.7% shows that students have a certain level of awareness regarding the presentation forms of media content. On the other hand, the proportion of neutral participants being 27.1% (n=26) shows that this information is not perceived with the same clarity by every participant. The proportion of those expressing negative opinions is limited to 6.3% (n=6).

Table 16. *"I follow whether legal and ethical rules are adhered to in the broadcasts of mass media."*

Response	**f**	**%**
Strongly Disagree	7	7,3
Disagree	26	27,1
Neutral	26	27,1
Agree	22	22,9
Strongly Agree	15	15,6
Total	**96**	**100,0**

Source: Created by the author.

According to the information obtained from the answers to the questions in Table 16 above, it indicates that the participants' views regarding this item do not concentrate in a single direction. The fact that the proportion of neutral participants is at a remarkable level with 27.1% (n=26) shows that students cannot develop a clear attitude in following whether legal and ethical rules are adhered to in mass media. While the proportion of those expressing negative opinions is 34.4% (n=33) in total, the total proportion of positive opinions is at the level of 38.5% (n=37). This distribution reveals that some of the students think that they have awareness on this issue, but an important part either remains neutral or does not follow this regularly.

Table 17. *"As an individual, I know how much influence I have on the production process in mass media."*

Response	**f**	**%**
Strongly Disagree	6	6,3
Disagree	14	14,6
Neutral	29	30,2
Agree	33	34,4
Strongly Agree	14	14,6
Total	**96**	**100,0**

Source: Created by the author.

In line with the results obtained in Table 17, there is no clear consensus among the responses given by the participants, in other words the students, to the item "As an individual, I know how much influence I have on the production process in mass media." The fact that the proportion of neutral participants is at the highest level with 30.2% (n=29) shows that students cannot make a clear evaluation regarding their individual influence on the production process in mass media. While the proportion of those expressing positive opinions is 49.0% (n=47) in total, the total proportion of negative opinions is determined as 20.9% (n=20). This distribution reveals that although an important part of the participants consider themselves partially sufficient in this regard, the level of indecision is remarkable.

Table 18. *"I immediately notice when false reporting is made in mass media."*

Response	**f**	**%**
Strongly Disagree	3	3,1
Disagree	8	8,3
Neutral	26	27,1
Agree	38	39,6
Strongly Agree	21	21,9
Total	**96**	**100,0**

Source: Created by the author.

According to the results of the items presented in Table 18, an important part of the participants state that they can notice false news in mass media. The total of the responses "Agree" (39.6%; n=38) and "Strongly Agree" (21.9%; n=21) reaching 61.5% shows that students have a certain level of awareness on this issue. On the other hand, the fact that the proportion of neutral participants is at a remarkable level with 27.1% (n=26) suggests that some students are not sure about distinguishing false news. The fact that the total proportion of negative opinions remains limited to 11.4% (n=11) reveals that the participants who think that they do not have this skill are in the minority.

Response	**f**	**%**

Strongly Disagree	3	3,1
Disagree	9	9,4
Neutral	21	21,9
Agree	32	33,3
Strongly Agree	31	32,3
Total	**96**	**100,0**

Table 19. *"I notice hidden advertising in mass media."*
Source: Created by the author.

In Table 19 above, a large part of the participants stated that they can notice hidden advertisements in mass media. The total of the responses "Agree" (33.3%; n=32) and "Strongly Agree" (32.3%; n=31) reaching 65.6% shows that students have a certain level of awareness on this issue. On the other hand, the fact that the proportion of neutral participants is 21.9% (n=21) suggests that some students cannot develop a clear opinion about distinguishing hidden advertisements. The fact that the total proportion of negative opinions remains limited to 12.5% (n=12) reveals that the participants who think that they do not have this skill are in the minority.

Table 20. *"I can observe the influence of sponsors on broadcasts."*

Response	**f**	**%**
Strongly Disagree	3	3,1
Disagree	6	6,3
Neutral	21	21,9
Agree	31	32,3
Strongly Agree	35	36,5
Total	**96**	**100,0**

Source: Created by the author.

When the responses in Table 20 are examined, it is seen that an important part of the participants can notice the influence of sponsors on broadcasts. 32.3% (n=31) of the participants answered "Agree" and 36.5% (n=35) answered "Strongly Agree." The total of these two groups reaches 68.8%, showing that the majority of the students develop awareness regarding the guiding effect of sponsors on media content. On the other hand, it is seen that 21.9% (n=21) of the participants remain neutral. Although this rate does not constitute the majority, it reveals that some students cannot display a clear attitude in evaluating sponsor influence. This situation may be due to the fact that sponsor influence is not always perceived clearly and directly or that the content is presented implicitly. The proportion of participants expressing negative opinions is relatively low. The total of the responses "Disagree" (6.3%; n=6) and "Strongly Disagree" (3.1%; n=3) remaining at 9.4% shows that the number of students who state that they cannot notice sponsor influence is limited. This finding indicates that the sample group largely has critical media literacy.

Table 21. *"I notice implicit (hidden) messages conveyed by mass media."*

Response	**f**	**%**
Strongly Disagree	5	5,2
Disagree	11	11,5
Neutral	30	31,3
Agree	33	34,4

Strongly Agree	17	17,7
Total	**96**	**100,0**

Source: Created by the author.

According to the distribution of the responses in Table 21, it is seen that the participants generally display a positive tendency in noticing implicit messages. The total of the responses "Agree" (34.4%; n=33) and "Strongly Agree" (17.7%; n=17) reaches 52.1%, showing that more than half of the students think that they can perceive messages that are not explicitly expressed in mass media. On the other hand, the fact that the proportion of neutral participants is at a remarkable level with 31.3% (n=30) indicates that implicit messages cannot always be clearly distinguished. This situation may be due to the indirect and hidden nature of implicit messages, as well as being related to the participants not feeling sufficiently confident about this issue. The proportion of participants expressing negative opinions is relatively limited. The total of the responses "Disagree" (11.5%; n=11) and "Strongly Disagree" (5.2%; n=5) remaining at 16.7% shows that the students who state that they cannot notice implicit messages are in the minority.

Table 22. *"I have competence in analyzing the meanings in the messages given through mass media."*

Response	**f**	**%**
Strongly Disagree	4	4,2
Disagree	4	4,2
Neutral	23	24,0
Agree	42	43,8
Strongly Agree	23	24,0
Total	**96**	**100,0**

Source: Created by the author.

When the distribution of the responses to the questions in Table 22 is examined, it is seen that a large part of the participants think that they can analyze the meanings in the messages given through mass media. The proportion of participants who answered "Agree" is 43.8% (n=42), while the proportion of those who answered "Strongly Agree" is determined as 24.0% (n=23). The total of these two groups reaching 67.8% reveals that the majority of the students consider themselves sufficient in interpreting and making sense of media messages. However, the fact that 24.0% (n=23) of the participants remain neutral shows that one out of every four students cannot make a clear evaluation regarding this skill.

This situation suggests that the multi-layered structure of media messages makes the analysis process difficult for some students.

The proportion of participants expressing negative opinions is relatively low. The total proportion of participants who answered "Disagree" and "Strongly Disagree" remaining limited to 8.4% (n=8) shows that the number of students who consider their message analysis skill insufficient is in the minority.

When evaluated in general, the findings related to item 17 reveal that students have a largely positive perception regarding analyzing and making sense of media messages; however, this competence is not at the same level among all participants.

General Evaluation of Media Literacy Scale Items

The Media Literacy Scale, developed by Karaman and Karataş (2009), consists of 17 Likert-type items. The items in the scale are, respectively: "the individual's ability to decide for themselves whether the messages in mass media are true or false, awareness of the values such as consumer culture, violence, and similar values produced by mass media, distinguishing for what purposes (social responsibility, consumption, informing, entertaining, etc.) messages are created, determining the positive and negative aspects of broadcasts in mass media, approaching the messages given in mass media with a critical perspective, having competence regarding the effects of mass media on individuals, being aware of the political, economic, cultural, and social priorities of mass media, being able to

give positive and negative reactions to the messages in mass media, being able to make suggestions for protection from the negative aspects of broadcasts in mass media, knowing that the given messages are created in different forms in different mass media, following whether legal and ethical rules are adhered to in the broadcasts of mass media, knowing to what extent one can influence the production process in mass media as an individual, noticing false reporting in mass media, distinguishing hidden advertisements in mass media, observing the influence of sponsors on broadcasts, noticing the implicit (hidden) messages conveyed by mass media, and finally having competence in analyzing the meanings in the messages given through mass media," and it consists of a total of 17 items within this framework.

When all the items of the scale are evaluated together, it is seen from the results obtained from the scale items that the participants, in other words the students, generally display a positive attitude regarding knowledge, analysis, and evaluation skills related to media literacy. In particular, it is noteworthy that the responses "Agree" and "Strongly Agree" are predominant in the items related to understanding, interpreting, and critically evaluating the messages in mass media. However, the relatively high rates of neutrality in some items show that participants may experience hesitation from time to time in evaluating certain media content and especially in noticing implicit messages. This situation indicates that the multi-layered structure of media messages cannot be analyzed at the same level by every participant.

The fact that the proportion of participants expressing negative opinions remains generally at a low level reveals that the basic awareness regarding media literacy exists across the sample. Overall, the findings obtained show that students do not only consume media content passively; on the contrary, they actively participate in the processes of making sense, questioning, and evaluating.

5.2. Findings and Interpretations Related to Research Problems and Hypotheses

5.2.1 Findings Related to Hypothesis 1

In this section related to Hypothesis 1, the findings related to the first sub-problem expressed as "What are the media literacy levels of Sakarya University Faculty of Communication students?" and the H_1 hypothesis formed in line with this sub-problem are discussed. At this point, in order to determine the media literacy levels of Sakarya University Faculty of Communication students, the arithmetic mean and standard deviation values of the total scores obtained from the Media Literacy Scale developed by Karaman and Karataş (2009) were examined in detail. The result obtained from the descriptive statistical data indicates that the media literacy levels of Sakarya University Faculty of Communication students are at a medium and above level. Through these findings obtained, it shows that students have certain abilities to understand, evaluate, and analyze media content from a critical perspective. In line with the results obtained, the H1 hypothesis expressed as "Students' media literacy levels are at a medium and above level" was approved, and the H02 hypothesis was rejected.

5.2.2. Findings Related to Hypothesis 2

The findings related to Hypothesis 2 are expressed in this section as "At what level are the passive audience tendencies of Sakarya University Faculty of Communication students?" At this point, the findings related to the second sub-problem and the H2 hypothesis formed in line with this sub-problem are included in this section. Since there is no scale aimed at directly measuring passive audience behaviors within the scope of the research, students' passive audience tendencies were evaluated indirectly through their media literacy levels. At this point, passive audience indicators were evaluated through the scores obtained from the critical consumption dimension of the Media Literacy Scale consisting of 17 Likert-type items developed by Karaman and Karataş (2009). At this point, as a result of the descriptive statistical data obtained, it was determined that students' critical consumption levels towards media content are at a medium and above level. The point to be derived from these data is that students' tendencies to accept media content without questioning are low and that they do not display a completely passive attitude towards media messages. Therefore, according to the data obtained from the results, the H2 hypothesis was accepted and the H02 hypothesis was rejected.

5.2.3. Findings Related to Hypothesis 3

Table 2. *Pearson Correlation Analysis Results Between Variables*

Veriables	1	2	3
1.Media Literacy	1	-.033	-.021
2. Daily Internet Usage Duration	-.033	1	.382**

3. Social Media Usage Frequency	-.021	.382***	1

Significant at the p < .01 level.
Source: Created by the author.

In Table 2, Pearson correlation analysis was conducted to examine the relationship between the media literacy levels of female and male students and the indicators representing passive audience behaviors. According to the results obtained, there is a negative but not statistically significant relationship between the media literacy levels of female and male students and the duration of daily internet use ($r = -0.033$, $p > .05$). Similarly, a negative but not statistically significant relationship was found between the media literacy levels of female and male students and the frequency of social media use ($r = -0.021$, $p > .05$). In contrast, it was observed that there is a positive and statistically significant relationship between the duration of daily internet use and the frequency of social media use ($r = .382$, $p < .001$). In line with the findings obtained, since no significant relationship was found between the level of media literacy and the indicators representing passive audience behaviors, H3 was rejected and H03 was accepted.

5.2.4. Findings Related to Hypothesis 4

The fourth hypothesis of the study is as follows: "Do media literacy levels differ according to the demographic variables of students?" Hypothesis 4 is aimed at examining whether media literacy levels differ significantly according to the demographic variables of students. Within this scope, an independent samples t-test was applied in order to determine whether the total scores of students' media literacy differ according to the gender variable. The findings obtained are presented in Table 3.

Table 3. *Independent Samples t-Test Results of Media Literacy Levels by Gender*

Gender	n	Mean ($\bar{X}$)	SD
Female	56	3.78	0.67
Male	39	3.83	0.66
Test	t	sd	p
Independent Samples Test	-0.39	93	.696

*p < .05 is significant.
Source: Created by the author.

When Table 3 is examined, the mean media literacy score of female students is ($\bar{X} = 3.78$, sd = 0.67). The mean media literacy score of male students is ($\bar{X} = 3.83$, sd = 0.66). At this point, in Table 3, it has been determined that the mean media literacy scores of female and male students are quite close to each other. As a result of the independent samples t-test conducted in Table 3, no statistically significant difference was found between the total media literacy scores according to gender ($t(93) = -0.39$, $p > .05$).

As a result of these findings, it is shown that the media literacy levels of female and male students do not differ according to gender. In this direction, H1 was rejected.

Table 4. *Descriptive Statistics of Media Literacy Scores by Age*

Age Group	N	X	SS
18-20	53	62,25	11,44
21-23	38	66,58	10,58
24-26	3	71,33	10,21

27 and over	2	74,50	2,12
Total	96	64,50	11,21

Source: Created by the author.

When the results in Table 4 are examined, it has been determined that the total mean scores of media literacy differ according to the age groups of Sakarya University Faculty of Communication.

At this point, when the given results are examined, first, it was concluded that the media literacy mean of the students in the 18–20 age group is 62.25. Afterwards, it was concluded that the mean of the students in the 21–23 age group is 66.58.

While the mean scores in the 24–26 age groups are 71.33, it is seen that it increases to 64.50 points in the 27 and above groups. The results show that there are differences according to age groups in Table 4.

Table 5. *Test of Homogeneity of Variances (Levene) of Media Literacy Scores by Age Groups*

Variable	Levene	sd1	sd2	p
Medya Literacy	0,689	3	92	0,561

Source: Created by the author.

According to the results of the Test of Homogeneity of Variances (Levene) in Table 5, it has been determined that the variances of the media literacy scores of the students of Sakarya University Faculty of Communication belonging to age groups are homogeneous (p> .05). This result appears as a cross-sectional record that the variances between groups are equal and that the necessary assumption for the application of one-way analysis of variance (ANOVA) is met.

Table 6. *One-Way ANOVA Results Related to Media Literacy Level by Age Groups*

Source of Variance	Sum of Squares	df	Mean Square	F	p
Between Groups	773,759	3	257,920	2,127	0,102
Within Groups	11156,241	92	121,263		
Total	11930,000	95			

Source: Created by the author.

According to the results of the one-way analysis of variance (ANOVA) presented in Table 6, it has been determined that there is no statistically significant difference between the total media literacy scores of the students studying at Sakarya University Faculty of Communication according to their age groups (F (3,92) = 2.127, p> .05).
At this point, together with the data obtained, it is shown that the media literacy levels of the communication faculty students do not differ significantly according to the age variable. At this point, in Table 6, the H4 hypothesis established regarding the age variable was rejected.

Table 7. *Descriptive Statistics of Media Literacy Scores by Daily Internet Usage Duration*

Daily Internet Usage Duration	N	X̄	SS
1	1	64.00	-
2	15	65.00	6.86
3	48	64.75	11.23
4	32	63.91	13.10
Total	**96**	**64.50**	**11.21**

Source: Created by the author.

When Table 7 is examined, it is seen that the total mean scores of media literacy of female and male students among the participants are quite close to each other according to daily internet usage duration. The highest mean is in the group with a daily internet usage duration of 2 ($\bar{X}$ = 65.00). The lowest mean of students' daily internet usage duration is determined as 4 in the group ($\bar{X}$ = 63.91).

Table 8: *One-Way ANOVA Results Related to Media Literacy Level by Daily Internet Usage Duration*

Source of Variance	Sum of Squares	sd	Mean Square	F	p
Between Groups	18.281	3	6.094	0.047	.986
Within Groups	11911.719	92	129.475		
Total	11930.000	95			

Source: Created by the author.

When the data in Table 8 are carefully examined, according to the results of the one-way ANOVA test, it has been determined that there is no statistically significant difference between the total media literacy scores of the participants when examined according to daily internet usage duration (F (3,92) = 0.047, p = .986> .05). At this point, this finding shows that students' daily internet usage duration does not have a significant effect in relation to the level of media literacy.

In this direction, when the results obtained through the data within the scope of the research are examined, while H4: it is accepted that there is a significant relationship between the media literacy level of Sakarya University Faculty of Communication students and the indicators representing passive audience behaviors; H04: it is rejected that there is no significant relationship between the media literacy level of Sakarya University Faculty of Communication students and the indicators representing passive audience behaviors. Therefore, finally, based on this point, it has been concluded that H4 was accepted and H_{04} was rejected.

Table 9. *Descriptive Statistics of Media Literacy Scores by Social Media Usage Frequency*

Social Media Usage Frequency	N	$\bar{X}$	SS	
Never	1	64.00		-
Rarely	3	71.00	5.57	
Occasionally	16	61.75	11.22	
Frequently	51	65.47	9.47	
Always	25	63.52	14.68	
Total	96	64.50	11.21	

Source: Created by the author.

participants according to their frequency of social media use were calculated using SPSS 0.27.
When the descriptive statistics are examined, it is seen that the media literacy scores of female and male students have different means according to the frequency of social media use among the groups.

However, a one-way analysis of variance (ANOVA) was applied in order to determine whether these differences are statistically significant.

Table 10. *One-Way ANOVA Results Related to Media Literacy Level by Social Media Usage Frequency*

Source of Variance	Sum of Squares	sd	Mean Square	F	p
Between Groups	320.054	4	80.014	0.627	.644
Within Groups	11609.946	91	127.582		
Total	11930.000	95			

Source: Created by the author.

In order to determine whether there is a statistically significant difference between the total media literacy scores of female and male students according to their frequency of social media use in Table 10, a one-way ANOVA test was applied. At this point, first, the homogeneity of variances was examined with the Levene test and in the result obtained, it was seen that the variances are homogeneous (p = .103> .05). According to the results of the ANOVA test, no statistically significant difference was found between the media literacy scores of female and male students

according to their frequency of social media use (F (4,91) = 0.627, p = .644). In this direction, hypothesis four was rejected.

Discussion

This study was conducted in order to examine the relationship between the media literacy levels of Sakarya University Faculty of Communication students and the indicators representing passive audience behaviors. At this point, the data obtained within the scope of the research determine through the findings obtained that the level of media literacy is quite effective on the behavioral attitudes that Sakarya University Faculty of Communication students exhibit towards media content.

In line with the first sub-problem of the research, firstly, the media literacy levels of Sakarya University Faculty of Communication students were addressed. Within the scope of the research, first, in order to learn the general media literacy levels of Sakarya University Faculty of Communication students, the Media Literacy Scale developed by Karaman and Karataş (2009) was adapted and the arithmetic mean of 17 items was calculated through SPSS 0,27 and the overall mean score was obtained. The findings obtained within the scope of the research show that the general media literacy levels of communication faculty students are concentrated between medium and high levels. In other words, it presents the result that Sakarya University Faculty of Communication students do not accept media content as it is and that their skills of evaluating, analyzing and making sense of it with a critical perspective are high. In this direction, while hypothesis one was accepted, hypothesis two was rejected. At this point, the result obtained shows that Sakarya University Faculty of Communication students have awareness as they have high skills of exhibiting a critical attitude towards media content and analyzing it.

Within the scope of the second sub-problem of the research, the passive audience tendencies of Sakarya University Faculty of Communication students were handled indirectly within the scope of critical consumption. Since there is no scale developed for passive audience behaviors, it was not measured directly. It was evaluated through the scores obtained especially in the critical consumption dimension that students answered in the survey of the Media Literacy Scale developed by Karaman and Karataş (2009). The findings show that Sakarya University Faculty of Communication students are not in a passive audience profile that consumes social media content without questioning it completely.

On the contrary, it shows that communication students develop a critical attitude to a certain extent. Based on this point, the results support the H2 hypothesis, while the H02 hypothesis was rejected. The results obtained within the scope of the research suggest that as the media literacy level of Sakarya University Faculty of Communication students increases, their passive audience tendencies weaken.

The third sub-problem of the research examined the relationship between the media literacy level of Sakarya University Faculty of Communication students and the indicators representing passive audience behaviors. The Pearson Correlation analysis data obtained determined that there is a negative relationship between the media literacy level of communication faculty students and the indicators representing passive audience behaviors. In line with the findings obtained, the H3 hypothesis was accepted; the H03 hypothesis was rejected. At this point, the research data show that as the media literacy level of the students in the research group of the relevant university increases, individuals exhibit a more questioning and critical attitude towards media. At this point, it shows that communication students move away from the position of passive audience.

The last and fourth sub-problem of the research addressed whether the media literacy levels of communication faculty students differ according to the demographic variables of the students. According to the results of the independent samples t-test and one-way analysis of variance (ANOVA) conducted within the scope of the research, it was concluded that the media literacy levels of Sakarya University Faculty of Communication students do not show a statistically significant difference according to gender and age variables.

Based on the results of the research, while the H4 hypothesis was rejected, the H04 hypothesis was accepted. Therefore, it is thought that the frequent and intensive interaction forms that Sakarya University Faculty of Communication students establish with media may be related to their education processes.

Conclusion

In this study, the relationship between the media literacy levels of Sakarya University Faculty of Communication students and passive audience behaviors was examined. The findings obtained within the scope of the research indicate that the media literacy of Sakarya University Faculty of Communication students is quite an important issue especially on their attitudes towards media content.

In line with the information obtained from the research findings, it has been determined through the research results that the media literacy levels of Sakarya University Faculty of Communication students are at medium and high levels from a general point of view. This situation shows that the Faculty of Communication students are not in a passive audience profile that consumes media content, in other words social media messages, without questioning them as they are with a critical perspective, on the contrary, they are in an active audience profile. At this point, it has been concluded that the Faculty of Communication students have an awareness that consumes media content with a critical perspective. The results of the Pearson Correlation analysis conducted within the scope of the research determined that there is a negative relationship, in other words a negatively directed relationship, between the media literacy level of the Faculty of Communication students, who are the research group, and the indicators representing passive audience behaviors. This finding shows that the media literacy skills of Faculty of Communication students have a function that reduces passive audience tendencies. On the other hand, when analyzed in terms of demographic variables, it indicates that when the media literacy levels of students are examined according to demographic variables such as gender and age, they do not show a significant difference in terms of variables.

As a result, the importance of media literacy education has become a quite critical issue within the scope of the research. Media literacy is a skill that reduces individuals' passive, in other words passive attitudes towards social media content and enables them to approach the media information they have acquired with a critical perspective. At this point, it is recommended to provide various practices and activities in order to increase awareness especially for students studying at the Faculty of Communication.

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The Effectiveness of Learning Taxonomies in the Teaching of the Azerbaijan Language

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ABSTRACT
In the contemporary pedagogical environment, there is an increasing need for systematic and scientifically grounded approaches to enhance the efficiency of the learning process. In this context, learning taxonomies, particularly Bloom's taxonomy, serve as a significant methodological framework in the teaching of the Azerbaijani language. Taxonomies allow students to approach the language not merely as a set of grammatical rules but as a complex system of skills encompassing various levels of cognitive activity. In Azerbaijani language lessons, the primary goal is not only the transmission of knowledge but also the development of students' abilities to think critically, make connections, analyze, demonstrate creativity, and apply knowledge. Therefore, the application of taxonomies directly influences the quality of the learning process. Bloom's taxonomy structures cognitive activity across six levels—knowledge, comprehension, application, analysis, synthesis, and evaluation—providing teachers with a structured model for lesson planning and assessment. In the teaching of Azerbaijani, this model proves especially effective in areas such as text analysis, speech culture, writing skills, and the acquisition of language rules. Through the use of the taxonomy, students do not merely memorize information; they internalize it, apply it in new situations, analyze texts, establish logical connections between ideas, and justify their own viewpoints.
Research indicates that lesson models incorporating taxonomies enhance students' self-expression, strengthen reflective thinking skills, and foster an interactive learning environment. In Azerbaijani language classes, this approach contributes both to the effective development of language competencies and to student-centered teaching. Taxonomies enable teachers to adopt a differentiated approach, design tasks according to students' varying levels, and ensure a more objective assessment process. Consequently, the application of learning taxonomies in the teaching of Azerbaijani is not only a methodological innovation but also an effective pedagogical tool that supports students' cognitive development, thinking flexibility, and communicative skills. The purposeful implementation of this model positively impacts the quality of language education and facilitates the cultivation of competent students who meet the demands of the twenty-first century.
Keywords: learning taxonomies, Bloom's taxonomy, educational process, language learning, communicative functions

INTRODUCTION
In the contemporary educational process, the formation of students' knowledge is not limited to the mere transmission of information. The effectiveness of teaching is closely linked to the development of students' cognitive skills, as well as their analytical and creative thinking abilities. In this context, learning taxonomies hold a significant place in both pedagogical theory and practice, as they systematically classify different levels of learning activity and enable teachers to plan lessons purposefully. The teaching of the Azerbaijani language, like that of other languages, targets not only the acquisition of grammatical rules but also the development of students' abilities to think, communicate, and express themselves through language. For this purpose, the use of taxonomies—particularly models such as Bloom, Krathwohl, Harrow, and SOLO—supports the systematic development of students' cognitive, affective, and psychomotor skills. Bloom's taxonomy facilitates the organization of learning tasks according to levels of knowledge, comprehension, application, analysis, synthesis, and evaluation. Krathwohl's taxonomy emphasizes the formation of emotions, motivation, and values, while Harrow's taxonomy focuses on the development of psychomotor skills. The SOLO taxonomy, on the other hand, assists in assessing the structure and quality of students' responses. The implementation of these taxonomies in Azerbaijani language lessons renders the teaching process more purposeful, interactive, and student-centered. They provide teachers with a structured approach for lesson planning, regulating task difficulty, and assessment, while simultaneously supporting the effective development of students' language skills and enhancing their analytical thinking and communicative competence. The primary aim of this study is to examine the effectiveness of learning taxonomies in the teaching of the Azerbaijani language, determine the role of various taxonomies in the lesson process, and evaluate their impact on the development of students' cognitive, emotional, and motor skills. Within the scope of the research, the comparative analysis of theoretical and practical approaches, along with the evaluation of lesson examples and teaching methods, will explore how these approaches contribute to the

efficiency of student-centered learning. Language teaching is an instructional activity directed at forming relevant competencies in students through the interactive process between the teacher and learner. Language acquisition encompasses a set of tasks that require the development of target competencies, particularly those necessary for successful communicative activity. These competencies include listening to general or specific information, drafting business documents, writing personal letters, preparing congratulatory speeches, or delivering scientific presentations. Teaching methods in language education can be determined based on theoretical approaches and incorporate theoretical insights regarding the structural and communicative functions of the language. Depending on the methodology employed, the roles of the teacher and the student may vary: the teacher may act either as a corrector of errors and a more passive participant in the learning process or as a leader who directly influences the outcomes of instruction. Likewise, the student's role may range from memorizing material without understanding to fully comprehending its essence. Learning can be considered effective when information is transmitted from the teacher to the student and the knowledge acquired is enriched by the student with new insights. Language learning is a purposeful process of mastering a language, conducted both in formal settings with a teacher and independently in informal environments (Anderson & Krathwohl, 2001).

LITERATURE REVIEW

The process of language learning can be described through the framework of educational taxonomy. A learning taxonomy encompasses characteristic features related to the domain of learning. Among the most widely recognized taxonomies are those presented by Bloom, which cover the cognitive, psychomotor, and affective domains. These domains are of particular importance in the process of language acquisition.

Recent pedagogical studies emphasize that the integration of learning taxonomies contributes significantly to the development of higher-order thinking skills. When teachers design tasks according to hierarchical cognitive levels, students gradually move from simple recall to complex intellectual operations such as critical evaluation and creative production. In language education, this process is especially important because communicative competence requires not only knowledge of grammar but also the ability to interpret, analyze, and produce meaningful discourse.

The educational taxonomy was developed in 1956 by a group of researcher-psychologists led by the renowned American psychologist Benjamin Bloom, who specialized in teaching methods in pedagogy. In the 1960s, Bloom authored and published two significant scientific works that laid the foundation for his concept, known as Bloom's taxonomy. These works are "*Stability and Change in Human Characteristics"* and "*Taxonomy of Educational Objectives"* (Povey, 2019).

It is important to note that Bloom's taxonomy gained considerable popularity in U.S. educational institutions during the 1960s, although its application in schools declined somewhat over time due to critical perspectives.
An educational taxonomy is a system based on the principle of classifying and categorizing different levels of learning. It provides a framework that allows teachers to apply the principles of a six-stage diagram and the foundations of intellectual education in ordinary classroom settings. The levels of Bloom's taxonomy, arranged from simple to complex, include knowledge, comprehension, application, analysis, evaluation, and creative activity. All six levels belong to the cognitive domain, which relates to how the brain processes information and thought.

Another important advantage of taxonomic models is their ability to support differentiated instruction. Students possess varying levels of cognitive readiness, and the taxonomy framework allows teachers to create tasks that correspond to these differences. Lower-level tasks help learners establish basic knowledge, while higher-level tasks challenge advanced learners to synthesize ideas and formulate independent conclusions (Marzano, & Kendall, 2007). Such differentiation increases motivation and encourages active participation in the learning process.

From a methodological perspective, learning taxonomies also contribute to the transparency and objectivity of assessment. Clearly defined levels of cognitive activity allow educators to formulate measurable learning outcomes and design evaluation criteria that reflect the depth of student understanding (Richards, & Rodgers, 2014). As a result, assessment becomes not merely a measurement of memorized information but a comprehensive evaluation of students' analytical and communicative abilities.

If Bloom's taxonomy is visualized as a pyramid, the base represents the level of knowledge, which involves the ability to remember and reproduce previously learned information. Methods of demonstrating this stage include reading, repetition, and highlighting key points in textbooks and notebooks.

The next level, comprehension, involves understanding meaning, translation, interpretation, and the ability to express information in one's own words. Methods of expression include identifying similarities and parallels, describing analogous events, and searching for information online.

The third level, application, requires the student to use previously acquired knowledge in various situations. Methods of expression at this stage involve applying methods, theories, laws, principles, and concepts in new and concrete practical contexts.

One of the central stages of Bloom's taxonomy is analysis. This stage involves breaking down material into its constituent parts and identifying similarities and differences among them. Methods of expression include identifying hidden assumptions, recognizing errors and gaps during reasoning, and distinguishing facts from consequences.

The fifth stage, synthesis, entails the ability to combine and generalize knowledge to create a new, original solution or product, such as a novel approach to a problem. Means of expression include writing presentations or essays, preparing action plans, and systematizing existing information.

At the apex of the pyramid is evaluation, which involves assessing a position, work, or study. Evaluation may include analyzing and critiquing the concepts of others, as well as assessing one's own perspective. Methods of expression include the ability to evaluate the logic of a concept and to determine the significance of specific outcomes.

METHODOLOGY

The process of language learning can be analyzed through the framework of educational taxonomy. Bloom's taxonomy, introduced in 1956, classifies learning objectives into hierarchical levels ranging from simple recall to complex evaluation and creation. This structure allows teachers to organize instructional activities systematically and design tasks that gradually increase cognitive complexity.

FINDINGS AND DISCUSSION

Three primary approaches can be identified in language acquisition. First is the classical accumulation of knowledge through memorization, consistent with the traditions of behaviorism established in the mid-20th century. In this approach, learning relies on mechanical memorization and repetitive practice of language patterns, with skill acquisition facilitated through repeated "stimulus–response" sequences.

According to B. F. Skinner, operant conditioning or reinforcement prepares learners to use their knowledge in previously unspecified, naturally occurring situations. In operant conditioning, spontaneous behavior and unprepared reactions to unexpected circumstances are positively reinforced (Pikhart & Klimova, 2019).

The cognitive approach, based on E. Tolman, teaches learners to use their knowledge for problem-solving in communicative contexts and aims to prepare students to "navigate real-life situations appropriately" (Tsulaia, 2023). Instruction should focus on students' mental processes and actions that involve understanding and correctly applying language structures in speech.

According to the theory of the renowned American linguist Noam Chomsky, language acquisition is directly associated with the brain's internalization of language rules, resulting in progressively fewer errors. Chomsky proposed that language learning is governed by specific rules, and the child's mind applies these rules in real-world situations, enabling human cognition to handle an infinite range of communicative contexts (Krathwohl, 2002).

Cognitivism presents the learner as an active processor of information. Language acquisition occurs most effectively when students gain experience by solving problems according to their own understanding.

The primary goal of language instruction is the formation and development of students' communicative competence, which entails mastering various types of speech activities. The subject of speech activity is thought itself; in essence, every speech task is a speech–thinking task. Language serves as a tool for the formation and expression of thought. Two key methodological implications arise from this perspective. First, for the successful development of skills and abilities in any type of speech activity, each student must be provided with opportunities for active oral practice. Second, through engaging in problem-solving tasks, students' attention should be directed toward the content of their speech, placing thought at the center while using language as a tool for shaping and expressing ideas.

The use of Bloom's taxonomy in English and other language lessons helps address these pedagogical challenges by organizing students' cognitive activity and supporting the development of oral communication skills. The cultivation of communicative competence remains a central aim of language teaching. Within the communicative approach, all tasks and exercises should inherently promote speech, emphasizing interaction and meaningful communication. E.I. Passov categorizes exercises into two types: conditional-speech and speech exercises. Conditional-speech exercises are specifically organized to develop a particular speech skill, often through repetitive practice of lexical units of the same type. In contrast, speech exercises require students to engage in cognitive–speech problem-solving during task performance.

Bloom's taxonomy facilitates the logical sequencing of speech–thinking tasks from simple to complex, stimulating motivation, engaging learners in communication, and promoting the development of higher-order thinking skills. Krathwohl's taxonomy, developed under Bloom's guidance, focuses on the affective domain, emphasizing learners' attitudes, emotional responses, and value-based development. This taxonomy describes the sequential stages of affective growth, from information reception to the integration of values as an intrinsic part of the learner's personality (Krathwohl, 2002). At the initial stage, the student is prepared merely to receive information, focusing on listening and comprehension. In the subsequent stage, the learner actively participates and demonstrates engagement through behavior, such as contributing to discussions and forming personal viewpoints on the topic. In the third stage, value internalization occurs, whereby the student adopts specific ideas as personal beliefs and demonstrates these values in behavior. In the following stage, learners organize their values, establish priorities, and create a structured hierarchy among them. Finally, in the last stage, these values are fully integrated into the student's personality, guiding behavior, decisions, and daily choices. At this level, values cease to be mere behaviors and become central elements of character.

This structured combination of cognitive and affective taxonomies provides educators with a comprehensive framework to develop language skills that are not only functional but also meaningful, reflective, and deeply embedded in learners' personal and social contexts.

The Harrow taxonomy addresses the psychomotor domain, classifying the development of physical skills and motor coordination. This model describes a sequential progression from reflex-level movements to complex motor activities. Initially, reflexive reactions are observed in the learner. Subsequently, the learner develops basic control of physical movements, such as walking, running, and jumping. At the next stage, learners coordinate their movements with sensory information—for example, catching a ball or accurately copying a geometric figure—demonstrating the integration of perception and action. Following this, the quality indicators of physical abilities, including endurance, strength, and flexibility, are developed. At more advanced stages, the learner masters complex motor tasks requiring sequential coordination, such as playing a musical instrument, driving, or swimming. The highest stage of psychomotor development involves non-verbal communication, where the body is used expressively to convey emotions and meaning, as in dance, pantomime, or acting.

The SOLO taxonomy (Structure of the Observed Learning Outcome), developed by John Biggs and Kevin Collis, is a classification system focused on the structure and quality of learners' responses rather than the thinking process itself (Biggs & Collis, 1982). It allows educators to evaluate how a learner's response is structured, the level of integration, and the degree of generalization. At the initial stage, the learner's response may be irrelevant to the topic or absent altogether. At the next level, the learner grasps only one aspect of the topic. In subsequent stages, multiple aspects may be identified, but logical connections between them are not established. At the relational stage, learners integrate various aspects into a unified structure, demonstrating understanding of the relationships and the essence of the topic. The extended abstract stage, the highest level of SOLO, involves generating new hypotheses, extrapolating beyond the given context, and producing broader theoretical generalizations. This stage represents the pinnacle of creative, analytical, and conceptual thinking.

Table 1. Comparative Characteristics of Learning Taxonomies

Taxonomy	Domain	Main Levels	Educational Application
Bloom	Cognitive	Remember, Understand, Apply, Analyze, Evaluate, Create	Planning lessons and assessing cognitive development
Krathwohl	Affective	Receiving, Responding, Valuing, Organizing, Characterizing	Developing attitudes, motivation and value orientation
Harrow	Psychomotor	Reflexes, Basic movements, Perceptual abilities, Skilled movements	Development of motor and physical performance skills
SOLO	Cognitive structure	Pre-structural, Uni-structural, Multi-structural, Relational, Extended abstract	Evaluation of the structure and quality of students' responses

A comparative analysis of these taxonomies demonstrates that each system organizes a different dimension of learning, providing teachers with critical analytical tools for instructional planning. Bloom's taxonomy allows teachers to evaluate students' cognitive sequencing, including what they can think, analyze, and create. Krathwohl's taxonomy monitors learners' affective and value-based development, showing what they feel and which values they internalize. Harrow's taxonomy organizes students' motor skills, coordination, and physical performance, indicating what learners can do. SOLO taxonomy provides a structured framework for assessing the depth and quality of learners' responses, offering an objective measure of response sophistication.

As an example of applying Bloom's taxonomy to the development of speech–thinking activities, a lesson model for the 4th-grade Azerbaijani language topic "Punctuation in Writing" is presented, illustrating how cognitive, affective, and psychomotor dimensions can be systematically integrated into classroom instruction.

Lesson Topic: "Punctuation in Writing"
Grade: 4
Subject: Azerbaijani Language
Method: Bloom's Taxonomy (Tasks organized across six levels)

1. REMEMBERING
Objective: Students recall the main punctuation marks and name them.
Teacher's Activities:
• Displays punctuation marks on the board: . , : ; ? ! - " " ( )
• Provides a brief explanation; the main recall comes from students.
Student Tasks:
• List the names of the punctuation marks.
• Complete sentences:
○ "A question mark is placed at the end of …"
○ "Quotation marks are used for …"

2. UNDERSTANDING
Objective: Students explain the usage of punctuation marks.
Teacher's Activities:
• Writes examples on the board and asks students to explain them.
Student Tasks:
• Read the following sentences and explain correctly:
1. "Grandmother said: 'Come quickly!'" — Why are the colon and quotation marks used here?
2. "Emil, bring the book." — Explain why the comma is used.
3. "The book – is the key to knowledge." — Why is the dash used here?

3. APPLYING
Objective: Students correctly apply punctuation marks in new sentences.
Tasks:
• Insert appropriate punctuation marks into the following sentences:
1. Nermin said to me this morning do not forget your book
2. What beauty is this
3. Ali Leyla Samir and Gunel registered for the club
4. Atatürk said My greatest work is the Republic of Turkey

4. ANALYZING
Objective: Students analyze the functional differences of punctuation marks.
Task:
• Compare the following sentences:
1. He said he will come.
2. He said: "I will come."
Questions:
• Which punctuation marks are used in each sentence?
• What is the difference in meaning between the sentences?
• Why are colon and quotation marks used in one, and a comma in the other?

5. EVALUATING

Objective: Students justify correct or incorrect usage of punctuation marks.
Task:
- Teacher displays the sentence: “Children said teacher is coming.”
- Students discuss:
  - How should this sentence be written correctly?
  - Which punctuation marks are present and why?
  - What is the most correct version? Explain with reasoning.

6. CREATING
Objective: Students produce original texts using punctuation marks.
Tasks:
- Students choose one option:

Option A: Write a short 3–4 sentence dialogue using quotation marks correctly.
Option B: Write a mini-story (5 sentences) using at least six different punctuation marks (., ?, !, :, –, “ ”).
Option C: Prepare a small announcement (e.g., “Found,” “Lost,” “Event”) using appropriate punctuation.

Lesson Conclusion and Reflection:
- Students are asked: “Which punctuation mark was the most difficult to use today, and why?”
- Teacher summarizes students’ answers and provides brief feedback.

Learning taxonomies are a powerful methodological tool for planning pedagogical activities, structuring lessons, and developing all components of learning. They allow teachers to define learning objectives precisely, design tasks that address cognitive, affective, and psychomotor domains, and conduct assessments in an objective and transparent manner. Purposeful use of these taxonomies makes learning more systematic, meaningful, and oriented toward comprehensive student development.

CONCLUSION AND RECOMMENDATIONS

The study demonstrates that learning taxonomies provide an effective methodological framework for Azerbaijani language instruction. Taxonomies such as Bloom, Krathwohl, Harrow, and SOLO support the systematic development of cognitive, affective, and psychomotor aspects of learning. Their integration into classroom practice facilitates student-centered learning, enhances communicative competence, and promotes higher-order thinking skills.

The results suggest that the systematic application of taxonomies transforms language instruction from simple knowledge transmission into a comprehensive educational process aimed at developing analytical thinking, creativity, and communication abilities. Consequently, the use of learning taxonomies represents a significant step toward modernizing Azerbaijani language education in accordance with the demands of twenty-first-century pedagogy.

The application of learning taxonomies in Azerbaijani language instruction allows the language learning process to be viewed not merely as the transmission of linguistic information, but as a complex domain of development integrating students’ cognitive, emotional, and motor skills. Taxonomy models such as Bloom, Krathwohl, Harrow, and SOLO provide teachers with practical, systematic, and transparent frameworks for lesson planning, task structuring, and assessment criteria. This approach enhances students’ abilities not only to recall and repeat content but also to comprehend and apply new material, analyze texts, and produce creative responses.

Specifically, in Azerbaijani language lessons, the use of these taxonomies facilitates the creation of student-centered tasks with high-level thinking requirements. Bloom’s taxonomy assists in planning questions and activities across different cognitive levels, while Krathwohl’s taxonomy promotes affective and value-oriented development, such as establishing an emotional connection with language meaning. Harrow’s taxonomy focuses on physical and motor skills, enabling attention to body language, gestures, and other psychomotor expressions during language instruction. SOLO taxonomy, in turn, serves as a scientific tool to evaluate the structure, depth, and coherence of students’ responses.

Research findings indicate that the purposeful implementation of these taxonomies makes the teaching process more active, interactive, and motivating. Students not only passively receive information but also actively organize knowledge analytically, solve problems, and express their ideas creatively. Teachers can differentiate tasks according to students’ needs and employ a broad range of assessment formats based on structured levels.

Nevertheless, the effectiveness of taxonomies is accompanied by certain challenges. Integrating this approach deeply into lesson plans requires teachers to have substantial knowledge and training. Additionally, assessment criteria must be carefully developed to ensure objectivity and alignment with the taxonomy, so that student performance is measured fairly and accurately.

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The Use of Artificial Intelligence in Philosophy Education

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Abstract
Philosophy education at the higher education level requires a delicate balance between concretising abstract concepts on the one hand, and developing critical thinking skills and preserving theoretical depth on the other. This paper analysed the pedagogical and academic competencies of two leading models, Gemini 3 Pro and Claude Opus 3, through the design of an undergraduate "Ethics" course. Within the scope of the study, six different prompts were given to the models, ranging from a student-centred approach to academic depth, and from a structured syllabus format to constrained resource management. The data obtained were examined through a deductive thematic analysis method. The findings indicated that Gemini 3 Pro displayed a provocative and dialectical stance, whereas Claude Opus 3 exhibited a structuring and more inclusive pedagogical posture. The research showed that Large Language Models were not merely content producers but also collaborators representing, in the sense defined in the literature, distinct pedagogical orientations.

1. Introduction

Philosophy is, by its nature, a discipline grounded in inquiry. Ethics courses in undergraduate philosophy curricula aim to bridge students' everyday moral intuitions with normative ethical theories. In traditional curriculum design this bridge was constructed through the instructor's experience, whereas today Large Language Models (LLMs) add a data-driven dimension to this process. However, the question of how each artificial intelligence (AI) model perceives and structures the concept of "teaching" has remained insufficiently examined in the field of educational technology. This study aimed to examine, through empirical data, the differing strategies and normative assumptions of the Gemini 3 Pro and Claude Opus 3 models in curriculum design.

While the established applications of AI in education developed largely along two axes, namely student-facing ITS systems and system-facing automation tools managing administrative processes (Holmes, Bialik, & Fadel, 2019), the recent rise of Generative AI shifted the field towards augmenting human capacity and collaborative intelligence (Luckin et al., 2016).

Curriculum design is not merely the sequencing of content but a process of establishing a coherent link between learning objectives, instructional activities and assessment. Biggs's (1996) theory of constructive alignment requires that learning outcomes be systematically aligned with both assessment methods and teaching strategies. Similarly, Wiggins and McTighe's (2005) Backward Design model proposes that design begin with objectives. This study questioned the capacity of LLMs to simulate these pedagogical theories.

Current literature emphasises that AI's role must be reconsidered beyond traditional instrumental use, as a collaborator working alongside humans in educational processes (Bozkurt et al., 2023). Recent reviews have charted the rapid growth of AI applications in higher education (Crompton & Burke, 2023) and outlined both the opportunities and the risks of large language models for teaching and learning (Kasneci et al., 2023). Pedagogical frameworks have also emerged for how AI might be assigned roles such as tutor, coach or simulator in classroom design (Mollick & Mollick, 2023). At the same time, critical perspectives have called for nuanced discussion of whether AI can replicate the social, emotional and cognitive qualities of human teachers (Selwyn, 2019). In this context, LLMs are not an authority replacing the teacher but assistants generating and structuring ideas. This assistant role does not, of course, mean that the models understand in the way humans do. Indeed, Bender et al. (2021) argued that models do not produce meaning but merely match linguistic forms statistically (the stochastic parrot). While this limitation makes human supervision necessary, it does not alter the fact that the models contribute to pedagogical design processes at a functional level. Thus, while acknowledging the absence of meaning identified by Bender et al, this study rested on the premise that the models can be used as pragmatic design partners.

2. Method

This study was designed as a comparative case analysis within qualitative research methods. Data were collected from two models intentionally selected for comparative analysis in November 2025: Gemini 3 Pro and Claude Opus 3. Rather than the OpenAI models that have been widely examined in the literature, these two were preferred through purposive sampling. The main rationale for this selection was as follows:

1. Epistemic Profile Differences: To observe the differences in philosophical text production between Gemini's knowledge-graph-oriented reasoning capability and Claude's long-context and nuance-oriented structure.
2. Alignment Policies: To compare the stances of Anthropic's Constitutional AI approach (Bai et al., 2022) and Google's safety policies in the face of provocative ethical scenarios.

2.1. Data Collection Process

The data set consisted of a six-stage prompt chain (V1–V6) involving the concepts of "justice", "virtue", "responsibility" and "the good" (Table 1). Data were collected through the web interfaces of both models. A single model output was taken into evaluation for each prompt variation. Prompts were given to both models in the same order and in the same language (Turkish), and each session was reset so that no context would carry over between consecutive prompts.

Table 1: *Prompt Variations Used in the Research*

Variation	Focus	Prompt Content (Summary)
V1	Pedagogical Focus	"Develop a student-centred and interactive model… Simple and concrete examples…"
V2	Academic Depth	"Philosophically sound… At least two references and a summary of arguments…"
V3	Structural Clarity	"In course syllabus format… Learning objectives, assessment questions…"
V4	Pragmatic Constraints	"Min. reading, max. 1-hour class… Little jargon, short text…"
V5	Meta-Ethical Relations	"Emphasising the hierarchy between concepts… Relational structure…"
V6	Final Design	"4-week module, table format, reference list…"

2.2. Data Analysis and Evaluation Criteria

The AI outputs obtained were evaluated within a deductive framework based on Boyatzis's (1998) theory-driven analysis approach, according to pre-determined pedagogical and ethical criteria. Rather than classical line-by-line coding, the focus in this process was placed on the presence and quality of the identified themes in the texts. To ensure systematic analysis, four main evaluation criteria derived from the literature were operationally defined (Table 2).

Table 2: *Analysis Criteria and Definitions*

Criterion	Definition	Indicators
Prompt Fidelity	Degree of compliance with constraints	Strict: applies literally /Flexible: bends the format / Deviation: departs from it
Pedagogical Tone	Rhetorical relation established with the student	Provocative: creates cognitive dissonance /Scaffolding: supportive
Curriculum Structure	Logical flow of the course	Linear: foundations to superstructure /Cyclical: reciprocal interaction
Content Depth	Quality of sources	Technical: jargon-heavy /Applied: contemporary examples

3. Findings and Analysis

The data obtained showed that the models' pedagogical priorities and philosophical positions diverged distinctly. The analysis results were elaborated under four main themes.

3.1. Pedagogical Tone and Interaction (V1 & V4)

In the variations that tested student-centredness and constrained resources, the models' strategies for engaging students with the course occupied opposite poles.

Gemini 3 Pro (Cognitive Dissonance and Gamification): The model framed the learning process as an exit from a comfort zone. In the V1 output, it proposed a competitive simulation (red-button voting) that divided the class

into two and forced students to play the role of either a Kantian or a Utilitarian. In the V4 scenario, while handling Peter Singer's (1972) drowning child example, it produced the following provocative instruction for the instructor: "Ask the students: 'Which of you would let the child die?' (No one raises a hand). The Brutal Truth: 'Then you are all murderers, because with the money in your pocket right now you could save someone, but you chose to buy coffee.'"

This instruction operated on two levels. First, an intuitive response (one ought to save the child) was elicited from the student; second, the conflict between this intuition and everyday consumption choices was confronted, generating cognitive dissonance. The strategy preserved Singer's original argumentative structure faithfully but intensified its rhetorical force. This output may be read as Gemini's construal of the "interactive model" and "student-centred" emphases in the V1 and V4 prompts as a call for ethical provocation.

Claude Opus 3 (Scaffolding and Safe Space): The model designed the learning process as a gradual journey from the known to the unknown. In V1, before entering abstract theories of justice, it began with simple and non-threatening metaphors such as "Cake Division". This choice aimed to consolidate the intuitive ground before philosophical abstraction through an analogy drawn from the student's everyday experience. In V4, it created an inclusive ground for discussion through everyday dilemmas of Generation Z, such as Instagram posts or consumption habits. Claude, rather than accusing the student, guided them in systematising their intuitions. This approach, in contrast to Singer-style provocation, positioned ethical discussion as a conceptual mapping exercise rather than the identification of individual faults.

3.2. Academic Depth and Reference Management (V2 & V3)

The models' command of the literature and topical foci pointed to a divergence between analytic metaphysics and applied ethics.

Gemini 3 Pro (Technical and Metaphysical Focus): The model sought philosophical depth in conceptual analysis. In particular, in the V2 module (Responsibility), it placed the debate over the Principle of Alternate Possibilities (PAP) between P. F. Strawson (1962) and Harry Frankfurt (1969) at the centre, using technical jargon approaching the postgraduate level:

"Consider a 'Frankfurt Case': there is a chip in your brain… You had no other choice but you are still responsible because the act coincided with your will."

This choice framed the concept of responsibility primarily as a matter of free will. The discussion turned more towards the analytic conditions of agency than the social conditions of moral responsibility. This preference showed that Gemini shifted the philosophical discussion of responsibility from a first-year undergraduate level towards a philosophy of mind seminar.

Claude Opus 3 (Interdisciplinary and Political Focus): The model sought philosophical depth in contextual breadth. In the V2 output, it placed John Doris's (2002) situationism critique and Iris Marion Young's (2011) theory of structural injustice alongside the classical texts, thereby extending the discussion into psychology and political science. This reference selection indicated that Claude treated responsibility less as a metaphysical problem and more as the analysis of an institutional and collective structure. In the V3 output (the course syllabus), it categorised sources as foundational, supplementary and advanced, and added grading rubrics, presenting an administratively complete, institutional document. This last feature revealed that the model grasped the administrative dimension of curriculum design beyond pedagogical content production.

3.3. Curriculum Structuring and Conceptual Relations (V5)

The V5 variation, in which inter-conceptual hierarchy was questioned, brought out the models' epistemological assumptions.

Gemini 3 Pro (Foundationalist Approach): The model framed the concepts in a linear and hierarchical order, placing "the good" at the bottom (root cause) and "justice" at the top (output). It rendered this relation concrete through the following metaphor:
"To speak of justice without defining the good is like fuelling a ship without a course."

This structure offered students a clear causal chain and facilitated pedagogical follow-up. It also presupposed an epistemological priority among ethical concepts: value theory (the good) came before normative theory (justice). This was a didactically economical approach, consistent with the classical teleological tradition of ethics.

Claude Opus 3 (Coherentist Approach): The model approached the prompt's instruction to "establish a hierarchy" critically and proposed a cyclical network model in which the concepts reciprocally shape one another:
"I propose to you not a hierarchical but a cyclical model. For there is no unidirectional foundational relation among these concepts — they reciprocally shape one another."

This approach was notable in two respects. First, rather than complying directly with the prompt's instruction, the model questioned the philosophical assumption behind it. Second, the proposed structure aligned with reflective equilibrium (Rawls, 1971) and coherentist meta-ethical traditions. This preference corresponded to a philosophical stance that emphasised the complexity and irreducibility of ethical phenomena. It also carried a pedagogical cost: for a first-year student, a cyclical conceptual map was a structure more difficult to follow than a linear chain.

3.4. Final Design and Mode of Production (V6)

In the final design where all constraints converged, the models' prompt fidelity and user experience preferences diverged.

Gemini 3 Pro (Formal Fidelity and Summarisation): Adhering strictly to the prompt's "table format" instruction, it compressed the entire curriculum into a single, dense table. In content production, it took the path of summarising the philosophers' arguments in simplified form. This strategy gave priority to the formal dimension of the prompt over pedagogical content, compressing content density for the sake of formal rigidity.

Claude Opus 3 (Functional Flexibility and Simulation): By bending the table-format instruction, it presented course details in fluid prose blocks and placed only the summary programme in a table. In content production, rather than summarising the philosophers' arguments, it attempted to establish direct dialogue with the student through representative paragraphs written as if the philosopher were speaking at that moment. This strategy brought two additional pedagogical implications: on the one hand, concretising the philosopher's argument through a first-person voice increased accessibility for the student; on the other, the model's loose adherence to the formal instruction became evident.

4. Discussion

In light of the analyses, the roles undertaken by the two models in curriculum design may be defined as follows:

1. Gemini 3 Pro (idea generator /disruptor): With its provocative tone and technical depth, it excelled at creating the spirit and philosophical tension of the course.
2. Claude Opus 3 (curriculum builder /facilitator): With its scaffolding tone, flexible understanding of fidelity, and command of administrative detail, it proved more successful at constructing the backbone of the course.

This study showed that the models were not merely technical tools but also normatively imposed particular pedagogical conceptions.

Gemini 3 Pro encoded philosophical education as a process of Socratic Discomfort. This approach overlapped with Boler's (1999) pedagogy of discomfort, which unsettles a student's entrenched assumptions and emotional comfort to trigger ethical inquiry. The student profile the model presupposed was a subject resilient to intellectual shocks, rational, and nourished by conflict. According to this view, reaching the truth was assumed to require dismantling comfort zones.

Claude Opus 3, by contrast, reflected a conception of Liberal Education and Psychological Safety. This stance paralleled the language of learning, examined critically by Biesta (2016), which frames education primarily as a learning experience. The student profile the model presupposed was a subject in need of guidance, progressing through a gradual learning process. Since Claude's Constitutional AI alignment tended to soften confrontational rhetoric, institutional compatibility and inclusivity emerged as the model's constitutive values. Thus, the choice of model was not merely a technical preference for the instructor but also a pedagogical and normative one.

5. Limitations

This study had the character of exploratory research on the potential of LLMs in curriculum design. The following limitations should be borne in mind:

1. Hypothetical Student Outcomes: The effects that the curricula produced by the models would have on students (for instance, that Gemini's unsettling language might generate resistance, or that Claude's examples might increase participation) remained pedagogical hypotheses not yet grounded in empirical data. Actual learning outcomes and student satisfaction can only be measured through the implementation of these curricula.

2. Sample and Generalisability: The study was deliberately limited to Gemini and Claude. The performance of other LLMs based on OpenAI may differ. In addition, the normative assumptions contained in the prompts designed by the researcher (for example, the expression "student-centred" in V1) may have steered the models' outputs towards a particular pedagogical approach (such as scaffolding).
3. Technological Transience: The findings rested on cross-sectional data from November 2025.

6. Conclusion

This research showed that Large Language Models were not merely content banks for philosophy education but also collaborators capable of simulating different pedagogical methods. For the design of an effective ethics course, the recommended model is not adherence to a single model but the placement of Gemini's provocative questions under Claude's pedagogical framework.

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Appendix: Prompts (V1–V6)

V1: "I want you to develop a student-centred and interactive model for the purpose of conveying the concepts of justice, virtue, responsibility and the good to undergraduate students taking the ethics course in a philosophy department. The model should be supported with examples that are as simple and concrete as possible. It should contain at least one thought experiment or case study each week, and there will be a four-week programme. Could you prepare it?"

V2: "I want you to develop a philosophically sound model with conceptual depth, for the purpose of conveying the concepts of justice, virtue, responsibility and the good to undergraduate students taking the ethics course in a philosophy department. The model should contain at least two references to classical or contemporary philosophical texts for each concept, and should summarise the main arguments of these texts. There will be a four-week programme and each week will focus on one concept. Could you prepare it?"

V3: "I want you to develop a model in the format of a clear weekly course syllabus, for the purpose of conveying the concepts of justice, virtue, responsibility and the good to undergraduate students taking the ethics course in a philosophy department. Learning objectives, key concepts, suggested readings and a short assessment question should be specified for each week. The model will be a four-week programme and should present output that is as structured as possible. Could you prepare it?"

V4: "I want you to develop a model that takes into account minimum reading material and a maximum class duration of one hour, for the purpose of conveying the concepts of justice, virtue, responsibility and the good to undergraduate students taking the ethics course in a philosophy department. The model should contain as little philosophical jargon as possible, and there will be a four-week programme. For each week, only one short text (maximum 500 words) is sufficient as a suggestion. Could you prepare it?"

V5: "I want you to develop a model that emphasises the philosophical relations and hierarchy among these concepts, for the purpose of conveying the concepts of justice, virtue, responsibility and the good to undergraduate students taking the ethics course in a philosophy department. The model should clearly show how one concept affects the others or how it provides a foundation for them. There will be a four-week programme and each week will focus on one aspect of this relational structure. Could you prepare it?"

V6: "I want you to develop a model for undergraduate philosophy students that will enable them, without prior knowledge, to conceptually understand the concepts of justice, virtue, responsibility and the good in an ethics course, and to develop their critical thinking skills. The course will consist of four-week modules and each week will be two hours of class time (eight hours in total).

For each week, prepare a lesson plan of 1000–1500 words in plain and clear language, containing the following components:

- Weekly learning objectives
- Key concepts
- At least two references from classical and contemporary philosophers such as Aristotle, Kant, Mill, Bentham and Rawls, with a summary of the main arguments of these references
- Student-centred thought experiments and case studies
- Discussion questions
- Sample texts

Present the output in table format; let there be a separate row or section for each week. Also, add a short reference list to be used at the end of each module."

The Use of Chatbots and AI Assistants in Foreign Language Learning: Effectiveness and Student Experience

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ABSTRACT
This article reviews how chatbots and AI assistants are being used in foreign language learning, with a focus on both learning effectiveness and student experience. It is based on a qualitative document analysis of foundational studies, systematic reviews, conceptual publications, and recent research on conversational AI in language education. The reviewed literature includes early text-based chatbots, dialogue systems for writing and speaking support, voice-based tools, and newer generative AI systems such as ChatGPT. Overall, the evidence suggests that chatbots and AI assistants can expand opportunities for practice, provide quick responses, support learner autonomy, and make speaking or writing tasks feel less intimidating. Students often appreciate these tools because they are available at any time, respond quickly, and offer a lower-pressure space for trial and error, particularly when language anxiety limits classroom participation. At the same time, the literature also points to important weaknesses. Chatbots may give inaccurate, unnatural, or overly general responses; they may encourage superficial interaction; and they may raise concerns about privacy, dependence, and uncritical trust in AI-generated language. Student experience is therefore shaped not only by the tool itself, but also by task design, teacher guidance, learner proficiency, and the educational purpose of use. The article concludes that chatbots and AI assistants are most valuable when they are used as planned supplements to teacher-led language teaching, rather than as replacements for teachers or authentic human communication. Recommendations are offered for classroom implementation, teacher preparation, and future research.
Keywords: chatbots, AI assistants, foreign language learning, EFL, student experience, speaking practice, language education

INTRODUCTION
Conversational technologies are now a familiar part of language education. Early rule-based chat programs have gradually developed into a wider group of tools, including educational chatbots, dialogue systems, voice assistants, and large language model interfaces. For language teachers, these tools are attractive because they seem to address a persistent classroom problem: students need frequent, low-pressure opportunities to use the target language, but class time rarely allows for enough individual interaction. In foreign language contexts, where contact with fluent speakers outside school may be limited, the promise of anytime practice is especially appealing (Jia, 2009; Fryer et al., 2020).

The interest in conversational agents has grown for both pedagogical and technological reasons. Pedagogically, interaction is central to language development because learners need to negotiate meaning, produce language for real purposes, and receive feedback. Dialogue systems can offer repeated practice in speaking and writing, help learners revisit vocabulary and grammar, and provide a space where mistakes feel less public. Technologically, advances in natural language processing, speech recognition, and generative AI have made these tools more flexible and easier to access than earlier scripted chatbots (Bibauw, François, & Desmet, 2022; Xiao et al., 2023). Still, enthusiasm about chatbots needs to be balanced with caution. Language learning is not simply the exchange of messages. It also involves pragmatics, social context, cultural meaning, feedback, and sensitivity to nuance. A chatbot may imitate conversation without fully recreating the richness and unpredictability of communication with

another person. Its feedback can be immediate but shallow, and its language can sound fluent while still being inaccurate or unsuitable for the situation. For this reason, the main question is not whether chatbots are good or bad, but when and how they can make a meaningful contribution to learning.

Recent work has widened this discussion by focusing on generative AI tools such as ChatGPT. These systems can explain grammar, model conversations, rewrite texts, generate examples, and answer learner questions in ways that older chatbots could not. Studies with foreign language learners suggest that such tools may support motivation, vocabulary learning, grammar work, and independent practice (Klimova, Pikhart, & Al-Obaydi, 2024; Karataş et al., 2024). However, the same studies also warn that learners may become too dependent on AI output or accept inaccurate information too easily.

This article reviews research on chatbots and AI assistants in foreign language learning for two main purposes. First, it brings together evidence on effectiveness across speaking, writing, vocabulary, confidence, and engagement. Second, it considers student experience, including motivation, anxiety, perceptions of usefulness, and concerns about accuracy and trust. By connecting earlier chatbot research with newer studies on generative AI, the article aims to offer a balanced view of how conversational AI is influencing foreign language education.

METHODOLOGY

Research Design

This article follows a qualitative review design based on document analysis. This approach was chosen because research on the topic appears in several forms, including conceptual papers, classroom studies, systematic reviews, and handbook chapters. The review is interpretive rather than statistical. Its aim is to explain how the literature discusses effectiveness and student experience when chatbots and AI assistants are used in foreign language learning.

Source Selection

Sources were selected because they addressed at least one of four areas: conceptual discussion of conversational agents in education, empirical evidence on language-learning outcomes, review studies of chatbot interventions, or learner-focused research on usefulness, motivation, affect, and classroom experience. Priority was given to peer-reviewed journal articles, reputable book chapters, and well-cited reviews published between 2009 and 2024. Earlier chatbot studies and recent generative AI publications were included together so that the development of the field could be followed more clearly.

Analytical Strategy

The literature was analyzed thematically under five categories: pedagogical affordances, reported learning outcomes, student perceptions and affect, design limitations, and implementation issues. Studies were also compared by target skill, type of conversational system, and the amount of teacher involvement. This made it possible to separate broad claims about AI from more specific claims about how conversational tools are actually used in language-learning practice.

Trustworthiness

The trustworthiness of the review depends on the quality and range of the sources, as well as on transparent interpretation. To avoid presenting only one side of the discussion, the review includes both supportive and critical studies. Greater weight was given to findings that appeared repeatedly across the literature rather than to isolated claims from a single intervention.

FINDINGS

Table 1: Main types of conversational tools used in foreign language learning

Tool type	Typical use in language learning	Representative sources
Rule-based text chatbot	Scripted text interaction for vocabulary, grammar, or simple dialogue.	Jia (2009)
Educational chatbot	Task-oriented support for classroom writing, revision, or guided practice.	Lin & Chang (2020); Okonkwo & Ade-Ibijola (2021)
Dialogue system / conversational agent	More flexible text or speech interaction for L2 practice.	Bibauw et al. (2022); Xiao et al. (2023)

Voice assistant	Speech-based practice for pronunciation, fluency, and oral interaction.	Jeon (2024); Du & Daniel (2024)
Generative AI assistant	Open-ended prompting, explanation, modeling, and revision support.	Klimova et al. (2024); Karataş et al. (2024)

The reviewed literature shows that chatbots and AI assistants should be treated as pedagogical tools with particular strengths and limits, not as universal solutions. Their usefulness depends on the type of interaction they support, the language skill being practiced, the quality of feedback, and the way the tool is built into a learning design. Table 1 summarizes the main types of conversational tools discussed in the literature and the functions most often linked to them.

One of the clearest benefits across the literature is the increase in practice opportunities. Jia's (2009) CSIEC project was an early attempt to design a chatbot that could support English learning beyond the limits of teacher availability. Later work by Fryer et al. (2020) and Bibauw et al. (2022) shows that this remains one of the strongest arguments for using chatbots: they give learners more chances to use the target language when human partners are not always available. In foreign language settings, that added practice time can be especially important.

Table 2: Reported learning benefits in the reviewed literature

Outcome area	Observed benefit	Supporting sources
Speaking practice	More opportunities to rehearse oral production and increase willingness to communicate.	Bibauw et al. (2022); Du & Daniel (2024)
Writing development	Support for drafting, idea generation, organization, and revision.	Lin & Chang (2020); Karataş et al. (2024)
Vocabulary and grammar	On-demand examples, reformulations, and repeated practice.	Klimova et al. (2024); Karataş et al. (2024)
Learner autonomy	Self-paced practice and immediate responses outside class time.	Fryer et al. (2020); Klimova et al. (2024)
Affective support	Lower anxiety and greater comfort in low-stakes interaction.	Jeon (2024); Cislowska & Peña-Acuña (2024)

The strongest evidence for learning benefits appears in areas where repetition, guided production, and quick responses are useful. Table 2 summarizes the main benefits reported in the reviewed studies. Dialogue-based systems seem particularly helpful for speaking practice, confidence building, vocabulary recycling, and writing support. Bibauw, Van den Noortgate, François, and Desmet (2022) found an overall positive effect for dialogue systems in language learning, especially in vocabulary and oral production tasks. Du and Daniel's (2024) review also suggests that AI-powered chatbots can support English speaking practice by improving confidence, engagement, and willingness to communicate.

Student experience is another major theme. Learners often describe chatbots as convenient, always available, and less intimidating than human conversation partners. This matters because anxiety can be a serious barrier in foreign language speaking and writing. When students hesitate to speak because they fear embarrassment, a non-judgmental chatbot can offer a useful rehearsal space. Jeon (2024) found that young EFL learners saw chatbots as helpful conversation starters that supported motivation and participation. Cislowska and Peña-Acuña's (2024) review also reports that students often value chatbots because they reduce some of the social pressure connected with classroom performance.

The literature also makes an important distinction between task-oriented chatbots and generative AI assistants. Traditional chatbots usually work within narrower limits, which can make them easier to connect to a specific classroom task such as role-play, vocabulary review, or structured question answering. Generative systems are more flexible and can respond to a wider range of prompts, but their responses are less predictable. For teachers, this distinction matters. A limited chatbot may be less impressive, but more reliable for a clearly defined activity. A generative tool may be more versatile, but it needs stronger guidance and critical supervision.

Effectiveness also varies by target skill. Speaking practice benefits from systems that support turn-taking, repeated production, and a lower fear of mistakes. Writing support benefits from tools that can model structures, suggest

wording, and respond to questions about organization. Vocabulary learning is strongest when chatbots recycle target words in meaningful contexts rather than simply giving definitions. Reading and listening appear to benefit less directly unless chatbot use is connected to wider tasks such as comprehension checks, summaries, or discussion. This helps explain why findings differ across studies: the value of a conversational agent depends on the pedagogical job it is asked to do.

Table 3: Frequently discussed limitations and risks

Issue	Why it matters pedagogically	Representative discussion
Inaccurate output	Learners may internalize incorrect language or misleading explanations.	Klimova et al. (2024); Karataş et al. (2024)
Shallow dialogue	Conversation may remain formulaic and provide limited communicative depth.	Fryer et al. (2020); Bibauw et al. (2022)
Generic feedback	Immediate responses do not always equal pedagogically useful correction.	Okonkwo & Ade-Ibijola (2021); Xiao et al. (2023)
Overreliance	Students may delegate too much drafting or problem solving to AI.	Karataş et al. (2024); Klimova et al. (2024)
Ethical and privacy concerns	Schools need clear rules for data protection and responsible use.	Winkler & Söllner (2018); Okonkwo & Ade-Ibijola (2021)

Student experience also differs by proficiency level. Beginners may appreciate simplified interaction, controlled tasks, and the chance to repeat an activity several times. At the same time, they may be less able to recognize incorrect or overly complex AI output. More advanced learners can use AI to explore discourse, compare styles, and test pragmatic choices, but they may also find simple or repetitive responses frustrating. The literature therefore supports differentiated use: lower-level learners need more scaffolding and narrower tasks, while intermediate and advanced learners can benefit from more open-ended activities when guidance is available.

Another recurring issue is the difference between authentic communication and simulation. Chatbots can help learners rehearse language, but rehearsal is not the same as real communication. Human interaction includes spontaneity, ambiguity, repair, nonverbal cues, and social consequences that chatbots only partly reproduce. Stronger implementations therefore do not try to replace authentic communication. Instead, they use AI-supported practice as preparation for peer discussion, classroom speaking, presentations, or independent writing.

The literature also raises a wider classroom question: what kind of language-learning culture is created when students interact regularly with AI? In positive cases, these tools can normalize experimentation and make practice more frequent. However, there is also a risk that learners begin to see language mainly as a set of prompts and outputs rather than as social communication shaped by audience, context, and meaning. For this reason, chatbot use should be accompanied by reflection. Students need chances to discuss when AI helped, when it misled them, and how machine-generated interaction differs from human communication.

Learner autonomy is another commonly reported advantage. Chatbots and AI assistants allow students to practice at their own pace, request examples when needed, and return to explanations more than once. In higher education, this flexibility is often described as one of the most useful features of generative AI. Klimova et al. (2024) found that university students viewed ChatGPT as useful for practicing foreign language skills and receiving individualized help. Karataş et al. (2024) similarly reported that learners used ChatGPT for writing, grammar, and vocabulary support, and that these experiences often increased motivation.

Table 4: Implementation principles for effective classroom use

Principle	Classroom implication	Expected benefit
Task alignment	Use AI for explicit linguistic goals rather than unrestricted chatting.	Improves relevance and learning focus.
Teacher mediation	Discuss prompts, outputs, and errors with learners.	Promotes reflection and prevents blind trust.
Human-AI balance	Combine AI rehearsal with peer and teacher interaction.	Supports transfer to authentic communication.
Critical AI literacy	Teach learners to verify and challenge AI responses.	Builds judgment and reduces misinformation.

Assessment redesign	Value process, reflection, and oral performance, not only final text.	Discourages uncritical dependence on AI-generated output.

Writing support is one area where the evidence is especially practical. Lin and Chang (2020) showed that a chatbot-supported writing environment helped post-secondary writers develop thesis statements and improve peer feedback. The important point is not simply that a chatbot was present, but that the tool guided students through specific stages of the writing process. This fits a broader pattern in the literature: conversational tools are most useful when they are attached to clear, bounded tasks rather than left as open-ended add-ons.

Despite these benefits, the literature identifies several important limitations. Table 3 summarizes the concerns that appear most often. One major issue is linguistic reliability. Chatbots may produce responses that sound correct but are pragmatically odd, contextually unsuitable, or pedagogically weak. This is especially important with generative AI, because confident language can make inaccurate output seem trustworthy. In foreign language learning, students may not yet have the ability to notice subtle errors, so unsupported use can create false confidence or reinforce mistakes.

A second limitation is interaction quality. Chatbots can simulate conversation, but not every chatbot conversation supports learning in the same way. Fryer et al. (2020) argue that many language-learning bots remain limited because they struggle with unpredictability, context, and nuanced feedback. Bibauw et al. (2022) also caution against treating all dialogue systems as educationally equal. A bot that simply gives short scripted replies may have little value beyond novelty, while a task-based system can support more meaningful practice.

A third concern is feedback. Teachers can diagnose errors, decide when correction is helpful, and adapt their response to the learner's level and emotional state. Chatbots may respond quickly, but their feedback can be generic or incomplete. Some students value the speed of these responses, even when they are only partial. In other cases, the lack of detailed correction limits learning. This is especially clear in speaking practice, where learners need support not only with grammar and vocabulary, but also with pronunciation, pragmatics, discourse management, and confidence.

Ethical and educational concerns have become more visible with generative AI. Students may rely too heavily on AI for drafting, rewriting, or answer generation, which can reduce productive struggle. Privacy, data protection, and the opacity of AI-generated explanations are also important concerns. The literature does not suggest that these risks require rejecting conversational AI altogether. Instead, schools need clear rules, critical AI literacy, and assessments that value reflection, revision, and authentic communication rather than polished AI-generated products alone.

Teacher mediation appears to be one of the most important conditions for successful use. Positive outcomes are more likely when teachers explain the purpose of the tool, provide prompts or goals, and connect chatbot interaction to larger classroom tasks. Table 4 summarizes implementation principles drawn from the literature. These principles suggest that conversational AI works best as a structured supplement: useful for rehearsal, exploration, drafting, and preparation, but not suitable as an independent judge of language competence.

Overall, the literature supports a careful but positive conclusion. Chatbots and AI assistants can increase practice opportunities and improve student experience, especially by reducing anxiety and giving learners more interaction time. However, their value depends on design quality, feedback reliability, learner training, and teacher oversight. Without pedagogical framing, they may become attractive but shallow tools. With thoughtful integration, they can become useful partners within a broader language-learning environment.

DISCUSSION

The findings suggest that the value of chatbots and AI assistants lies less in their novelty than in the way they create more opportunities for language use. In many foreign language classrooms, speaking and writing practice is limited by time, class size, and learner anxiety. Conversational AI can reduce some of these barriers by giving students additional spaces to rehearse. This helps explain why learners often report positive experiences even when measured learning gains are moderate. Availability, privacy, and responsiveness make practice easier to begin and easier to continue.

Accessibility is another issue that deserves attention. Conversational tools may help students who need repeated exposure, self-paced rehearsal, or written alternatives to oral performance. However, the same tools may also create barriers if interfaces are cluttered, speech recognition struggles with accented pronunciation, or prompts

assume cultural knowledge that some learners do not have. Inclusive implementation therefore requires flexible options, including text and speech modes, accessible interfaces, and tasks that can be adjusted to learner needs.

Classroom context also shapes outcomes. In small classes with strong teacher feedback, students may use chatbots to extend and refine what they have already practiced with people. In larger or exam-oriented settings, the same tools may be used mainly for quick correction, translation, or answer checking. Both uses can have a place, but they lead to different learning habits. The literature suggests that chatbot use is more likely to support durable language development when it is connected to reflection, dialogue, and communicative goals.

For this reason, implementation should be judged not only by whether students enjoy a tool, but also by the kind of language behavior it encourages. A useful tool should invite students to try new expressions, ask follow-up questions, revise meaning, and think about errors. A weaker use of the same tool may simply help students finish tasks quickly with little learning. This distinction should guide classroom decisions and future research.

Student experience should also not be confused with educational effectiveness. Enjoyment, convenience, and curiosity can support motivation, but they do not automatically lead to lasting learning. The strongest evidence comes from studies in which chatbot interaction is tied to explicit goals, such as speaking practice, writing development, or structured dialogue tasks. This is consistent with broader educational technology research: learning gains usually come from instructional design, not from the mere presence of a new tool.

The field itself is also changing. Earlier chatbot studies asked whether a conversational system could support language interaction at all. Current research increasingly asks which kinds of conversational AI are useful for which learners and tasks. Generative AI expands what learners can do, but it also increases concerns about accuracy, dependence, and critical evaluation. This makes the teacher's role more important rather than less important. Teachers help learners compare AI responses, notice limitations, and connect digital practice to human communication.

Affective factors are especially important. Many learners perceive chatbots as non-judgmental partners, and this can matter a great deal in foreign language learning. Anxiety, fear of negative evaluation, and reluctance to speak can reduce participation even when students know the required forms. If AI tools lower the emotional threshold for practice, they may support learning indirectly by increasing exposure and willingness to communicate. At the same time, students should not become comfortable only with AI-mediated interaction. They also need guided movement toward communication with peers and teachers.

Taken together, the literature supports a balanced position. Chatbots and AI assistants are not minor gimmicks, but they are also not replacements for human language teaching. Their strongest contribution is supplementary: they can expand practice, personalize support, and reduce anxiety. Their main risks appear when they are treated as authoritative, autonomous, or pedagogically sufficient on their own.

RESULTS AND CONCLUSIONS

This review examined the use of chatbots and AI assistants in foreign language learning and found broad evidence that conversational tools can support language development and improve student experience when the conditions are appropriate. The most consistent benefits are increased access to practice, reduced speaking anxiety, greater learner autonomy, stronger engagement, and support for specific areas such as speaking, vocabulary, and writing. These benefits are most visible when tasks are structured and when AI use is part of a wider teaching strategy.

The review also shows that student experience is central to understanding effectiveness. Learners generally respond positively to tools that are available, responsive, and private. These features can make language practice feel safer and more manageable. However, positive experience is not enough on its own. Problems related to accuracy, shallow interaction, generic feedback, privacy, and overreliance remain significant. For this reason, the literature does not support replacing teachers with chatbots or AI assistants.

The most defensible conclusion is that conversational AI is educationally valuable when it serves as a guided partner for rehearsal, drafting, feedback exploration, and additional target-language interaction. Its role should be supplementary, transparent, and pedagogically bounded. Used in this way, chatbots and AI assistants can enrich foreign language learning while preserving the central role of teachers, human interaction, and critical reflection.

RECOMMENDATIONS

Practical Recommendations

1. Teachers should use chatbots and AI assistants for clearly defined language tasks, such as dialogue rehearsal, vocabulary recycling, idea generation, role-play preparation, or writing revision, rather than leaving use completely open-ended.
2. Schools should include AI literacy in language instruction so that students learn to question AI output, verify examples, and recognize inaccurate or inappropriate language.
3. Conversational AI should be combined with human interaction. Students should move between AI-supported rehearsal and peer or teacher-guided communication so that practice does not remain artificial.
4. Assessment should value process, reflection, oral interaction, and revision history. This can reduce the risk that students rely on AI-generated text without learning from it.
5. Institutions should provide professional development for language teachers on prompt design, error analysis, feedback evaluation, and ethical classroom use of generative AI.

Recommendations for Future Research

1. More longitudinal studies are needed to determine whether repeated chatbot use produces lasting gains in speaking, writing, and pragmatic competence.
2. Future research should compare scripted bots, voice assistants, and large language model interfaces across proficiency levels and age groups.
3. More evidence is needed on how learners judge AI feedback and how teacher mediation changes the quality of learning outcomes.
4. Researchers should examine the social and emotional dimensions of student experience more closely, including anxiety reduction, confidence, willingness to communicate, and trust.
5. Further research is needed on ethical and assessment issues, especially how conversational AI affects originality, academic integrity, and independent language proficiency.

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