

# Strategies to Mitigate Mental Health Problems in Adolescents through Self-Care Gamification Platform

Xavier Kharis<sup>1\*</sup>, J. Johny Natu Prihanto<sup>2</sup>, Amanda Setiorini<sup>3</sup>

Universitas Multimedia Nusantara, Banten, Indonesia<sup>1,2,3</sup>

[<sup>1</sup>xavier.kharis@student.umn.ac.id](mailto:xavier.kharis@student.umn.ac.id), [<sup>2</sup>johny.natu@umn.ac.id](mailto:johny.natu@umn.ac.id), [<sup>3</sup>amanda.setiorini@umn.ac.id](mailto:amanda.setiorini@umn.ac.id)



## Article History:

Received on 11 March 2025

1st Revision 12 March 2025

2nd Revision 17 April 2025

3rd Revision 21 April 2025

Accepted on 30 April 2025

## Abstract

**Purpose:** This study aimed to explore how technology can help address the mental health challenges faced by adolescents in educational environments. It focuses on how digital tools assist educators in identifying, managing, and supporting students' mental health.

**Methodology:** A qualitative research design was employed, using purposive sampling to select participants. Data were collected through semi-structured interviews and analyzed using an interpretative approach to understand the participants' perceptions and experiences related to the use of technology in supporting mental health.

**Results:** The findings show that technology aids educators in recognizing and responding to students' mental health concerns, enhances their awareness, and increases their engagement in mental health initiatives. Digital platforms, such as online counselling, mental health applications, and virtual discussion spaces, help reduce stigma and promote open communication among students.

**Conclusions:** Technology has significant potential to support mental health efforts in schools by empowering educators and fostering active student participation in mental health programs. It serves as an effective medium for early detection, awareness, and emotional support.

**Limitations:** The study's limitations include the small number of participants and the focus on a single educational setting, which may limit the generalizability of the findings.

**Contribution:** This research provides practical insights for educators, policymakers, and mental health professionals on integrating technology-based approaches into school mental health strategies to create supportive and inclusive learning environments.

**Keywords:** *Adolescent, Education, Gamification, Mental Health, Technology, Qualitative Research.*

**How to Cite:** Kharis, X., Prihanto, J. J. N., Setiorini, A. (2025). Strategies to Mitigate Mental Health Problems in Adolescents through Self-Care Gamification Platform. *Studi Ilmu Manajemen dan Organisasi*, 6(3), 787-802.

## 1. Introduction

Mental health among adolescents has become a global concern in recent years in Indonesia (I-NAMHS: Indonesia-National Adolescent Mental Health Survey, 2022). This study was motivated by the increasing prevalence of mental health disorders among adolescents, which often go undetected and undertreated. Data shows that disorders such as depression, anxiety, and conduct disorder are increasingly common, with significant impacts on individual well-being and academic achievement. In the Indonesian context, this challenge is even more complex, given the social stigma attached to mental health issues, as well as the lack of access to adequate mental health services, especially in remote areas (I-NAMHS: Indonesia-National Adolescent Mental Health Survey, 2022).

Characteristics	10-13 years		14-17 years		Total	
	%	(n/N)	%	(n/N)	%	(n/N)
Male	36.1	(540/1.498)	33.0	(457/1.385)	34.6	(997/2.883)
Female	34.2	(498/1.458)	36.2	(479/1.322)	35.1	(977/2.781)
Total	35.1	(1.038/2.956)	34.6	(936/2.708)	34.9	(1.974/5.664)

Table 1. Prevalence of mental health problems among adolescents by sex and age groups based on the I-NAMHS survey report

The figure of 34.9% in the table is calculated by taking the total number of individuals (n) who meet the survey criteria, which is 1,974 people, and dividing it by the total respondent population (N) of 5,664 people. This result is then multiplied by 100 to express it as a percentage. This calculation encompasses all age categories (10-13 years and 14-17 years) as well as both genders (male and female). Thus, this figure represents the average proportion of the observed characteristics within the entire respondent population. Analyzing the data reveals the urgency of mental health disorders through the distribution of age groups and genders, noting the relatively balanced representation of males and females in both age categories (10-13 years and 14-17 years). With a total of 5,664 respondents, the percentage (approximately 35%) suggests that about one-third of this population may be facing issues relevant to the survey context. If this data relates to mental health disorders, it indicates that the problem is significant, especially since the 10-17 age range is a crucial developmental stage where individuals are more susceptible to emotional, social, and academic pressures. Moreover, the slight variation in gender distribution (34.6% for males and 35.1% for females) implies that mental health issues are not limited to a specific gender but are a concern across genders. The higher proportion among females in the 14-17 age group may point to increased vulnerability during adolescence. Given this data, mental health issues can be deemed urgent if symptoms affect more than one-third of the surveyed population, considering their impact on individual well-being, academic performance, and long-term development. Through this study, we sought to explore the various factors that contribute to mental health problems among adolescents, including academic pressure, social influence, and lack of support from the surrounding environment (Aisyaroh et al., 2022). We also highlighted the importance of mental health education in schools as a crucial preventive measure. By identifying the obstacles faced in the integration of mental health programs in schools, this study aims to provide relevant and contextualized recommendations to improve the effectiveness of existing interventions (Pham et al., 2023).

Through this study, we sought to explore the various factors that contribute to mental health problems among adolescents, including academic pressure, social influences, and lack of support from the surrounding environment. We also highlighted the importance of mental health education in schools as a crucial preventive measure. By identifying the obstacles faced in the integration of mental health programs in schools, this study aims to provide relevant and contextualized recommendations to improve the effectiveness of existing interventions.

One of the approaches we examine is the use of technology and gamification in mental health programs. With the rapid advancement of technology, there is an opportunity to develop digital platforms that can provide mental health support in a more engaging and interactive manner for adolescents. Gamification, which integrates game elements in a non-game context, can increase student engagement in mental health programs, making them more motivated to participate and seek help when needed (Aldalur & Perez, 2023).

The role of technology in addressing mental health issues is expected to help guide individuals as users to rediscover their “optimal” mental health condition through support in developing attention, correcting thought patterns, and helping to clarify perspectives (Salcedo et al., 2023). In other words, when discussing the process of mentoring, what is expected with technological advancements is the presence of technological support that empowers individuals to be motivated and encouraged to face challenges related to their mental condition psychologically (Timotheou et al., 2023). In this sense, an individual has several roles and tasks that must be carried out in efforts to improve well-being and

achieve optimal mental health. Such methods are commonly categorized as gamification. In this context, gamification allows individuals to perform objectives depending on the goals they wish to achieve (Aldalur & Perez, 2023).

Speaking of definitions, gamification is the application of game elements in a non-game context to enhance engagement, motivation, and user experience. This concept has attracted attention in various fields, such as education, health, marketing, and product development (Gkintoni et al., 2024a). By utilizing game mechanisms, gamification aims to encourage positive behaviors and achieve specific goals in a more engaging and enjoyable way (Gkintoni et al., 2024b).

Gamification is rooted in the understanding that humans are naturally drawn to challenges. Game elements such as missions, achievements, and competition can be used to create a more engaging experience in contexts that are typically considered boring or monotonous (Spanellis & Harviainen, 2021). In the field of health, for example, gamification can be used to encourage individuals to be more physically active, adopt healthier eating habits, or improve mental well-being (Li et al., 2023).

The mechanisms of gamification consist of several key elements that play a role in its effectiveness:

1. Goals and Challenges

One of the most fundamental elements of gamification is setting clear goals. Users need to understand what is expected of them and the challenges they must face. These goals must be specific, measurable, and achievable to maintain high motivation (Kumar Ghosh et al., 2021).

2. Rewards and Points

The reward system is an important component of gamification. Users can earn points, badges, or other rewards as recognition for their achievements. This not only provides a sense of accomplishment but also encourages users to continue participating (Aldalur & Perez, 2023).

3. Feedback

Providing quick and clear feedback is essential in gamification. Users must be able to see their progress and understand how their actions impact the outcomes (Gkintoni et al., 2024b). This feedback can come in the form of progress charts, notifications, or reports that display achievements.

4. Competition and Collaboration

The element of competition can increase user engagement. By creating leaderboards or group challenges, users can feel motivated to compete with others. On the other hand, collaboration is also important, especially in health contexts, where social support can enhance success (Salcedo et al., 2023).

5. Story and Narrative

Integrating story elements into gamification can make the experience more engaging. A good narrative can help users feel connected to a larger purpose and give meaning to their actions (Gkintoni et al., 2024a).

6. Personalization

Customizing the gamification experience to suit individual preferences and needs can enhance engagement. Users who feel that the experience is relevant and aligned with their interests are more likely to engage actively (Riches et al., 2024).

Gamification does not only involve using games themselves, but also applying game design principles. This includes creating clear goals, providing quick feedback, and offering rewards for achievements. In this way, gamification can enhance both intrinsic and extrinsic motivation in users.

In case of gamification and adolescent mental health issues, this approach serves as a method or strategy. Human life is never free from goals, achievements, and challenges that must be faced. However, in the process of achieving these goals, people are often burdened by the mindset that fulfilling responsibilities for a goal becomes something difficult, heavy, or even boring (Alqithami, 2021). Gamification becomes a method or approach that enables someone to achieve their goals with more enthusiasm and motivation (Spanellis & Harviainen, 2021). This is because the approach in gamification sees the psychological potential of humans, who tend to be challenged when goals are

presented in a more engaging way, and when someone succeeds, there is a sense of pride and increased self-confidence (Aldalur & Perez, 2023).

Such an approach is needed to address the challenges of mental health issues in adolescents. The presence of technology, particularly digital technology widely used in society, needs to be considered for its potential and opportunities to support the gamification method for self-care in addressing mental health issues in adolescents.

In this study, we found that educators' perceptions of the use of technology in the treatment of mental health disorders varied widely. Most educators showed a high level of interest in the use of technology, but they also expressed concerns regarding its effectiveness and long-term impact. The interviews indicated that while there is great potential for using digital apps and platforms to support students' mental health, many educators felt underprepared and lacked adequate training to integrate these technologies into their curriculum. Another challenge is the lack of support from schools and parents, who often do not understand the benefits of technology in the context of mental health. The findings suggest the need for a more systematic approach to training and capacity building for educators, as well as awareness raising among parents and communities on the importance of technology support in addressing adolescent mental health.

Based on these findings, mitigation strategies were formulated with a comprehensive and collaborative approach. The integration of mental health approaches with Learning Management System (LMS) is a strategic step that can improve the effectiveness of mental health support programs in educational settings. LMS, which has become an integral part of the modern learning process, offers a platform that enables efficient management and delivery of educational materials. By utilizing an LMS, schools can develop specialized mental health-focused modules that include not only information on mental health disorders, but also coping strategies, relaxation techniques, and resources for seeking help. Through the interactive features of the LMS, such as discussion forums, quizzes, and surveys, students can actively engage in learning about mental health, which in turn can increase their awareness and understanding of these issues.

Furthermore, this integration enables the collection of valuable data regarding students' mental well-being. Using analytics tools available within the LMS, educators can monitor student progress, identify behavioral patterns that may indicate mental health issues, and provide timely interventions. In addition, the LMS can be equipped with notification and reminder features that help students to stay connected with mental health materials, as well as remind them to engage in activities that support their well-being, such as meditation or exercise. Thus, the LMS serves not only as a tool to deliver information, but also as a holistic support system that can assist students in managing their mental health. The integration of this approach also encourages collaboration between educators, counselors, and psychologists, who can work together to design relevant and supportive content and provide more targeted support to students. By utilizing the full potential of the LMS, it is hoped that a more inclusive learning environment that is responsive to students' mental health needs can be created, so that they can thrive academically and emotionally.

## **2. Literature Review**

### ***2.1 Grand theory***

Grand theory in adolescent psychology serves as a broad framework for understanding various phenomena related to adolescent psychological development. Adolescents are an age group generally defined as individuals aged between 12 or 13 years old and 21 or 22 years old. In the Indonesian context, in accordance with Law No. 23 of 2002, a person can be categorized as an adolescent when they enter the age of 12 to 22 years old (Law No. 23 of 2002). Although there are differences in the age ranges used in different countries, the core of this developmental phase remains the same, where individuals are in a similar psychological phase.

One of the most influential theories in understanding adolescent development is the psychosocial theory proposed by Erik Erikson. Erikson identified the adolescent phase as the "identity vs. role confusion"

phase (Hoover, 2010). At this stage, adolescents experience a drive to explore the self and develop a strong identity. This process involves self-discovery, where adolescents try on different social roles and identities to find the one that best suits them.

This identity phase is very important as it can affect how adolescents interact with their social environment and how they see themselves. If adolescents are successful in this exploration process, they will develop a positive sense of identity. However, if they experience difficulties, they may get stuck in role confusion, which can lead to mental health problems, such as anxiety and depression (Sarwono, 2019).

In the context of adolescent development, it is important to consider the influence of the social context and the era at hand. In this fourth era of the 21st century, globalization and technological advances have brought new challenges for adolescents. Not only do they have to adapt to rapid changes, but they also have to face pressures from an increasingly complex social environment. This creates new challenges in adolescents' mental health, where they have to balance between the demand to adapt and the need to understand themselves (Rani, 2025).

Therefore, an approach to consider in supporting adolescents is early intervention. Early intervention aims to identify symptoms that lead to mental health disorders. In this regard, formal educational institutions, such as schools, have an important role in providing the necessary support and resources to help adolescents in their developmental process. By understanding this phase of development, we can better support adolescents in dealing with the challenges they face and help them develop a healthy and positive identity (Camlian & Baron, 2025).

## **2.2 Middle-ranged theory**

Middle-ranged theory in the context of this thesis focuses on mental health theory and mitigation strategies that can be applied to support adolescents in facing mental health challenges. Mental health theory provides a framework for understanding the various aspects that influence an individual's mental state, including biological, psychological, and social factors. Meanwhile, mitigation theory focuses on steps that can be taken to reduce the risk of mental health disorders and improve overall well-being.

Mental health is a continuous spectrum, where individuals can be at various points on the spectrum. According to Hodes and Gau (2016), "positive mental health" is a condition in which a person has good mental stability and is able to manage challenges that arise in daily life. This suggests that mental health is not just about the absence of disorders, but also about an individual's ability to function effectively in their lives. In the context of adolescents, this phase is particularly important as they are in the process of identity formation and face various pressures from social, academic and emotional environments.

One important aspect of mental health theory is an understanding of the symptoms of mental disorders. These symptoms can vary from individual to individual, and often go unnoticed by those around them. (Andrea Fiorillo, 2024) notes that "a lack of public awareness regarding the symptoms of mental health disorders can lead to individuals experiencing problems not getting the help they need." This points to the importance of education and awareness about mental health, especially among adolescents, so that they can recognize the early signs of a disorder and seek the necessary help.

Mitigation theory focuses on steps that can be taken to reduce the risk of mental health disorders. One effective approach is early intervention, which aims to identify early symptoms and provide the necessary support before problems become more serious. In the context of education, schools have an important role in detecting and addressing mental health problems among students. According to Jongsma Jr. et al. (2024), "formal educational institutions can be strategic places for early intervention, as they have direct access to adolescents and can provide the necessary support."

Early intervention can include various strategies, such as mental health education programs, counseling, and peer support. These programs are designed to raise awareness about mental health, teach coping skills, and provide a space for adolescents to share their experiences. By providing the right support,

adolescents can learn how to better manage their stress and emotions, which in turn can reduce the risk of mental health disorders in the future.

In addition, it is important to consider social factors that affect adolescents' mental health. The social environment, including family, friends, and community, has a significant impact on an individual's mental well-being. Research shows that strong social support can serve as a protective barrier against mental health disorders. Sarwono (2019) states that "positive interactions with people around adolescents can provide important emotional support in their identity formation process." Therefore, creating a supportive and inclusive social environment is essential for adolescent mental health.

### **2.3 Applied theory**

The applied theory in this study focuses on the use of technology and gamification as tools to support mental health, especially among adolescents. In this context, technology not only serves as a medium of communication, but also as a means to increase awareness and understanding of mental health. According to (Krewski et al., 2022), applied theory serves to conceptualize ideas that can be directly applied in practice. In this case, digital technology can be used to create a platform that supports positive interactions and learning about mental health.

Gamification, on the other hand, is an approach that integrates game elements in a non-game context to increase engagement and motivation. Known to be an effective strategy, gamification can help individuals to be more engaged in their mental recovery process. As stated by Deterding et al. (2011), gamification can increase intrinsic motivation by creating a fun and challenging experience. Thus, the application of gamification in mental health programs can have a positive impact on adolescents' engagement in their recovery process.

In this study, the authors sought to explore how technology and gamification can be integrated in mental health programs. Previous research has shown that the use of mobile apps and online platforms can help individuals manage stress and anxiety (Fleming et al., 2023). By utilizing gamification elements, such as rewards and challenges, individuals can feel more motivated to participate in activities that support their mental health. This is in line with Moreno & Radovic's (2018) view that technology-based approaches can provide better support for individuals experiencing mental health disorders. Furthermore, it is important to consider the social and cultural context when applying technology and gamification in mental health. The social stigma attached to mental health disorders often prevents individuals from seeking help (Vogel, 2022). Therefore, well-designed technology can help reduce such stigma by providing accurate information and educating people about mental health.

### **2.4 Synthesis and discussion**

#### **2.4.1 Research objectives**

This study aims to provide a comprehensive review of the use of technology in the treatment of mental health disorders, with a focus on the role of technology in supporting adolescents. One of the aspects studied was educators' perceptions of technology, including attitudes, beliefs, experiences, and challenges and recommendations related to its use. In addition, this study identified barriers to the integration of mental health programs in schools, such as limited policies, resources, stigma, and lack of training for educators. To overcome these challenges, clear policies, adequate resource allocation, and awareness raising through educational campaigns are needed. Furthermore, this research explores how gamification can be used as an innovative approach in the treatment of mental disorders, by increasing student engagement through interactive learning, gamification-based applications, and social support. With recommendations based on this research, it is hoped that the utilization of technology in mental health can be more effective and widely applied in educational settings.

### **3. Methodology**

The research method used in this study is a qualitative approach with a case study design, which allows researchers to explore phenomena in depth within a specific context (Russmann, 2022). The qualitative approach was chosen due to its focus on understanding the meaning and subjective experiences of

individuals, which is particularly relevant in the context of mental health, where emotional and psychological nuances are crucial to understand (David Creswell, 2014).

The research method used in this study is **qualitative research**, which focuses on an in-depth analysis of the phenomena being studied in an effort to understand the context, perspectives, and subjective experiences of the participants. Below is a detailed explanation of the **validity and reliability of instruments** in the context of qualitative research:

1. **Research Design**  
This study uses a qualitative approach aimed at gaining deep insights into the use of technology in addressing mental health disorders. The researcher collects data through in-depth interviews with educators and other relevant stakeholders.
2. **Respondent Selection**  
Respondents were selected using purposive sampling, where individuals are chosen based on specific criteria relevant to the study. This aims to ensure that the respondents can provide rich and in-depth information on the topic being examined.
3. **Data Collection**  
The instrument used is semi-structured interviews, allowing the researcher to explore certain themes while giving respondents the freedom to openly share their experiences.

### ***3.1 Instrument Validity***

Validity in qualitative research focuses on how well the instrument measures or answers the research questions posed. Several methods to ensure the validity of research instruments include:

1. **Content Validity**  
Ensuring that the interview questions cover all essential aspects of the phenomenon under study. This can be done by consulting experts in the relevant field to ensure that the questions asked are both relevant and comprehensive.
2. **Triangulation**  
Using various data sources, methods, or different researchers to examine the consistency of findings. For instance, in addition to interviews, researchers may use observation or document analysis related to the use of technology in mental health.
3. **Pilot Testing**  
Conducting trial interviews with several respondents before the main interview sessions to ensure that the questions are easily understood and effective in eliciting the required information.
4. **Member Checking**  
Asking respondents to review and provide feedback on the findings obtained, to ensure that the researcher's interpretation of the data accurately reflects the respondents' understanding.

### ***3.2 Instrument Reliability***

Reliability in qualitative research is more concerned with the **consistency and accuracy** of the data obtained. Although reliability in a qualitative context differs from that in a quantitative approach, some steps that can be taken to improve reliability include:

1. **Audit Trail**  
Creating clear and detailed records throughout the entire research process, from formulation and data collection to analysis and conclusion. This helps ensure that every research step can be accounted for and evaluated by others.
2. **Consistency in Data Collection**  
Researchers must follow the same procedures and techniques when conducting interviews with each respondent to minimize variation that may arise from differences in data collection methods.
3. **Documentation**  
Storing interview transcripts, notes, and other relevant documents to provide evidence for the analysis conducted. This allows others to verify and assess the research results.

According to Russmann (2022), qualitative research provides deeper insights into human behavior and its social context, which cannot be achieved through quantitative methods. Through this approach, researchers can collect rich and contextualized data, which includes in-depth interviews, observations,

and document analysis, thus providing a more holistic picture of the phenomenon under study (Russmann, 2022).

The case study in this research was designed to provide an in-depth understanding of :

1. Educators' perceptions of technology to treat mental illness
2. Obstacles faced in the integration of mental health treatment programs mental health
3. How gamification can be developed for mental health treatment mental health

Data collection in this study was conducted through semi-structured interviews, which allowed the researcher to probe for in-depth information while still giving participants the flexibility to share their experiences in a way that was most comfortable for them. These interviews are expected to yield rich and diverse data, reflecting each individual's unique (Creswell, 2014). In addition, the researcher also conducted observations of the participants' interactions with the gamification application, which provided additional context to understand how the gamification elements functioned in practice. These observations included not only how participants used the app, but also how they interacted with the features, as well as any emotional reactions that arose during use of the app.

By combining different methods of data collection, this research aims to achieve triangulation, which can increase the validity and reliability of the findings (Russmann, 2022). In data analysis, the researcher used a coding approach to identify key themes that emerged from the data, which were then analyzed in the context of existing literature. This analysis process involved inductive coding of the data, where the researcher looked for patterns and themes that emerged from the participants' experiences, and related them to theory and previous research.

## 4. Results and Discussion

### 4.1 Characteristics of Informants

This study involved few informants who were selected through purposive sampling, focusing on individuals with relevant experience in helping adolescents with mental health challenges and using digital technology. The informants included educators and counselors, each with over five years of professional experience, which provided a strong foundation for the study. This research was conducted using a **qualitative approach**, employing **in-depth interviews** as a method to gather information from those directly involved. This approach involved the **purposive selection of informants**, choosing individuals who have a strong understanding of how to handle students with mental health disorders and the challenges faced, including the use of technology in the process.

The selected informants came from work units relevant to the topic—namely, educators who are knowledgeable and directly engaged in the process. Additionally, informants were chosen based on their interest in the field of technology and their practical experience in real-world situations. The key informants selected had **more than 5 years of service**, aiming to explore more deeply their experiences in dealing with field-related issues over the course of their professional tenure.

### 4.2 Educators' Perception of Technology in Addressing Mental Health Issues

The informants acknowledged technology as a valuable tool for supporting adolescents in managing their mental health.

*"The current generation relies heavily on technology, and they often look for information on social media. However, the reliability of these sources can be questionable, so it's vital to create trustworthy platforms."*

According to Toda et al. (2023), technology is crucial for raising awareness, offering easy access to resources, and creating safe spaces for discussing sensitive topics. One informant noted:

This comment highlights the need for technology that is specifically designed to address the mental health needs of adolescents, with expert input considered during its development.



### **4.3 Challenges in Integrating Mental Health Support Programs**

One major challenge in utilizing technology for mental health support is the limited digital literacy among both educators and students. Vieira and Pedro (2023) point out that the integration of technology into education often faces hurdles like inadequate training and poor infrastructure. An informant expressed this concern:

*"We frequently find it difficult to grasp how new applications function. If we, as mentors, struggle with this, how can we assist students in using these technologies?"*

Another significant obstacle is the social stigma associated with mental health, which can deter students from seeking assistance (Vieira & Pedro, 2023). This observation is consistent with Juliansen et al. (2024), who noted that social stigma is a key barrier preventing adolescents from accessing mental health services.

### **4.4 Development of Gamification for Mental Health Management**

Gamification, which involves incorporating game elements into non-game settings, has emerged as a promising strategy for engaging adolescents in managing their mental health. Spanellis and Harviainen (2021) argue that gamification can create enjoyable and educational experiences that enhance motivation and awareness.

Informants pointed out the potential of gamification to help adolescents grasp their conditions through interactive scenarios and positive reinforcement. One informant remarked:

*"If students can learn about mental health through games, they are more likely to engage and understand the importance of maintaining their well-being."*

Gamification has also proven effective in other areas, such as encouraging physical activity and enhancing mental well-being, as shown by Chang et al. (2023).

### **4.5 Thematic Analysis**

The thematic analysis of the data revealed several key themes:

1. **Awareness of Mental Health:** Informants stressed the importance of increasing students' awareness of mental health through easily accessible platforms.
2. **Role of Technology as a Mediator:** Technology was seen as a facilitator that allows students to access information and support more comfortably.
3. **Improving Digital Literacy:** Targeted training for educators and students is crucial to fully leverage the benefits of technology in supporting mental health.

In this study, the results show that the application of digital technology in adolescent mental health support can enhance engagement and the effectiveness of interventions. This aligns with the Uses and Gratifications Theory developed by Riaz et al. (2023), which suggests that individuals use media (including digital technology) to fulfill specific needs. Research by (Zerine et al., 2025) confirms that the accessibility of digital technology enables person to more easily and quickly obtain information related to objectives, thereby increasing their awareness of some issues. Additionally, a study by (Ahmed et al., 2021) also highlights that well-designed mental health applications can improve users' knowledge and understanding of mental health, which in turn encourages them to seek further guidance. Furthermore, research by (Rani, 2025) reveals that innovation are capable of reducing the stigma associated with mental health issues, allowing adolescents to be more open to seeking help.

Moreover, the findings of this study are in line with a study by (Pérez-Jorge et al., 2024), which emphasizes that gamification in mental health applications can facilitate positive behavioral changes among adolescents. By incorporating game elements, interventions become more engaging for users, increasing the likelihood of continued involvement in the therapy offered. Research by Spanellis, et. al (2021) indicates that enjoyable, game-based interactions in health apps can boost adherence to mental health intervention programs among adolescents. On the other hand, a study by Aschentrup, et. al

(2024) underscores the importance of interactive design in mental health apps to ensure user engagement. This research suggests that mental health support should incorporate interactive and enjoyable elements in its implementation, thus encouraging users to be more active in the healing process (Aschentrup et al., 2024).

On the other hand, it is important to note that although technology offers many benefits, there are also challenges—particularly concerning data privacy and security. Research by (Zerine et al., 2025) highlights that, despite the significant potential in using digital technology for mental health, privacy and data security issues—such as misuse of personal data and user trust concerns—can reduce the effectiveness of interventions. This is supported by a study by (Chen et al., 2023), which found that many adolescents are hesitant to use technology for mental health consultations due to concerns about privacy and the disclosure of personal information. Furthermore, a study by Minerva, et. al (2023) indicates that stigma surrounding the use of technology for mental health issues can hinder its acceptance among adolescents. Therefore, to achieve optimal outcomes in technology-based mental health support, serious attention must be given to ethical considerations and privacy policies that foster trust among users (Minerva & Giubilini, 2023).

The personalization feature of the self-assessment tool provides recommendations based on the user's specific needs, helping them develop sustainable self-care habits (Ahmed et al., 2021). Additionally, integration with wearable devices enables real-time tracking of mental health metrics, providing insights for users to take proactive actions in maintaining their mental well-being (Alruwaili et al., 2023). Next, we return to the issue of motivation and stimulation. Self-care in the context of adolescent students is an important matter, but it must also be approached with a strategic plan to achieve this goal. In the course of this research, the author explored that in developmental theory, adolescents are individuals who require recognition, appreciation, and achievement to boost their self-confidence (Sarwono, 2019). As some informants have noted, today's adolescents are part of the digital generation, where various aspects of their lives depend on digital technology. Therefore, this digital sector must be well utilized as it serves as a potential medium that helps them connect with their surroundings (Weng et al., 2024). This must be packaged as a unified approach within the principles of gamification.

Gkintoni et al. (2024) argue that by leveraging engaging game elements, gamification can connect mental health education with the way adolescents interact with the world (Gkintoni et al., 2024). This makes learning about mental health more engaging and accessible, encouraging adolescents to be more open in discussing and managing their mental health issues (Gkintoni et al., 2024). Gamification becomes an element that motivates adolescents to act, with the goal of embedding positive habits in them (Toda et al., 2023). It can play an important role in developing the skills necessary to face mental health challenges. Through instructions presented as “objectives,” adolescents can learn coping techniques, manage emotions, and hone social skills in a safe and supportive environment (Aldalur & Perez, 2023). The elements of competition and collaboration in gamification can also strengthen the sense of community and support among adolescents, which is crucial for their mental health. Therefore, gamification not only conveys information but also creates an experience that supports skill development and enhances overall mental well-being (Gkintoni et al., 2024).

Regarding implementation in the school context, when referring to the Indonesian education transformation pathway 2020-2035, digitalization is one of the goals to be achieved (Purnomo et al., 2024). One of the important strategies outlined in this transformation pathway includes developing a digital-based national education platform and improving school or classroom infrastructure for the future (Purnomo et al., 2024). When referring to educational innovation by relying on this kind of digital transformation, gamification for mental health can be one of the services presented.

When referring to the purpose of digital learning itself, the main purpose of implementing digital learning is to increase the accessibility and flexibility of education, so that students can learn anytime and anywhere (Purnomo et al., 2024). In addition, digital learning aims to increase student engagement through interactive and engaging learning methods, as well as develop the digital skills needed to face challenges in the modern world of work (Purnomo et al., 2024). Finally, the application of digital

learning also focuses on improving the quality of education by utilizing technology to support more effective teaching and learning (Purnomo et al., 2024).

For habituation, schools need to encourage students to develop independent learning skills, such as time management and self-discipline, and provide support for collaboration in group projects online (Purnomo et al., 2024). Related to technicalities, then like missions or objectives in games, the flow or steps in the mentoring mechanism - including coping mechanisms - are packaged into “daily missions” accompanied by other missions related to daily activities (Nirmalasari & Minai, 2023).

This kind of digital format with gamification elements has been circulating among the public in Indonesia. However, in the context of education, gamification still has problems for its implementation strategy in the continuity of the education and mentoring process (Timotheou et al., 2023b). When referring to digital learning and LMS, students in the education process are helped by the presence of dashboards (Timotheou et al., 2023b). This dashboard gives students access to data about their learning progress, such as grades and completed assignments, and helps them recognize their strengths and weaknesses in the learning process (Timotheou et al., 2023b). With personalization features, students can view content tailored to their needs and interests, and get additional encouragement through gamification elements such as points and badges.

In addition, dashboards also facilitate collaboration and communication between students, teachers and parents, allowing for more effective monitoring of student progress. Although these dashboards offer many advantages, their availability may vary depending on the policies and technological infrastructure in each educational institution (Purnomo et al., 2024). Some schools have adopted a learning management system (LMS) that provides access to the dashboard, while others may not have such technology yet (Purnomo et al., 2024). In addition to academic reminders, the dashboard has the potential to be utilized to add mental health features, along with points, daily objectives, and progress data. Then it will be even more helpful if a notification and reminder feature is added that can be connected to the smartphone or laptop owned by the student. Thus the process of mentoring and stimulation can be maximized, and technology plays an important role as a tool in supporting mental health mitigation for adolescent students.

In addition, the dashboard also facilitates collaboration and communication between students, teachers, and parents, enabling more effective monitoring of student progress. Although this dashboard offers many benefits, its availability may vary depending on the policies and technological infrastructure of each educational institution (Purnomo et al., 2024). Some schools have adopted a Learning Management System (LMS) that provides access to the dashboard, while others may not yet have this technology (Purnomo et al., 2024). Besides reminders for academic matters, the presence of this dashboard also has potential if utilized to add features related to mental health, along with points, daily objectives, and progress data that have been achieved. It would be even more helpful if notification and reminder features are added that can connect to students' smartphones or laptops. Thus, the mentoring and stimulation process can be maximized, and technology plays an important role as a tool to support mental health mitigation for adolescent students (Quah, 2023).

To develop a concrete strategy for implementing mental health interventions at XYZ school through the use of gamification in the Learning Management System (LMS), the first step is to provide training for educators on mental health. This training includes introducing various types of common mental health disorders in adolescents, such as anxiety and depression, as well as effective communication techniques with students experiencing issues. After the training, educators can use screening tools, such as questionnaires and observations, to identify at-risk students. Identified students are then referred to the school psychologist for further evaluation through interviews and psychological tests.

Based on the evaluation results, the psychology team and educators will develop an intervention plan that includes individual and group approaches. This intervention program must be integrated with the existing curriculum, for example, by incorporating mental health topics into relevant lessons and organizing extracurricular activities that support mental health. Subsequently, the gamification

elements to be used in the LMS need to be designed, including points and rewards, as well as creating levels and badges for specific achievements. The gamification content must be relevant and engaging, such as interactive learning modules and educational games that teach coping skills (Sailer & Homner, 2020).

To prepare a supporting school ecosystem, it is important to create a school culture that cares about mental health. This can be done by holding seminars and workshops for students, parents, and school staff on the importance of mental health and how to support each other (Uddin et al., 2020). Additionally, forming a mental health team at school consisting of educators, psychologists, and student representatives can help in designing and implementing relevant programs. Physical facilities, such as comfortable counseling rooms and access to mental health resources, also need to be provided to support this initiative (Tangen et al., 2023).

Once the content is ready, the next step is to integrate it into the LMS, including system testing and user training for students and educators. After implementation, it is important to collect data on the effectiveness of the program through surveys and data analysis from the LMS to assess student participation. Program evaluation is conducted to determine whether the interventions and gamification have successfully improved students' mental health and to identify areas that need improvement. With a structured and collaborative approach, XYZ school can create an environment that supports students' mental health, making it a model in addressing adolescent mental health through the use of technology and gamification. Recommendations for the success of this program include parental and community involvement, increased resources for training, and program flexibility to adapt to students' ever-changing needs.

In designing an effective system or curriculum for addressing adolescent mental health, it is important to involve various work units, including IT, Application System Developers, and the Mental Health Task Force. This collaborative approach will not only improve the effectiveness of the program but also ensure that all aspects of adolescent mental health are comprehensively considered. Here are some strategies that can be implemented in developing the system or curriculum.

1. Needs Analysis and Initial Assessment

The first step in designing a system or curriculum is to conduct a thorough needs analysis. This involves gathering data from various sources, including surveys of students, interviews with educators, and discussions with parents (Camlian & Baron, 2025). This data will provide a clear picture of the mental health challenges faced by adolescents in the school environment. According to (Juliansen et al., 2024), a deep understanding of students' mental health conditions is essential for designing appropriate interventions.

2. Development of an Integrative Curriculum

After the needs analysis, the next step is to design a curriculum that is integrated with a focus on mental health. This curriculum should cover various aspects, such as mental health education, social skills, and stress management techniques. Application system developers can play a role in creating a digital platform that provides interactive learning materials and resources that students can access anytime (Purnomo et al., 2024). By utilizing technology, students can learn about mental health in a more engaging and relevant way.

3. Integration of Technology in Learning

Technology plays a very important role in education today. Therefore, it is essential to integrate technology into the mental health curriculum. The IT unit and Application System Developers can collaborate to create a mobile app or online platform that offers counseling services, discussion forums, and educational resources on mental health. According to Timotheou et al. (2023a), the use of technology in mental health education can improve accessibility and student engagement. Additionally, this platform can be equipped with features to monitor students' progress in understanding and managing their mental health.

4. Training for Educators

Educators are key to the implementation of the mental health curriculum. Therefore, it is crucial to provide adequate training on how to recognize signs of mental health issues and offer the right support to students. This training can include communication techniques, intervention strategies,

and understanding various mental health disorders commonly found in adolescents (Pandia et al., 2021). By enhancing educators' skills, they will be better equipped to help students facing difficulties (Vieira & Pedro, 2023).

5. Collaboration with the Mental Health Task Force

The Mental Health Task Force serves as a bridge between schools, parents, and community mental health services. They can assist in identifying students who need additional support and refer them to professional services. Furthermore, the Mental Health Task Force can contribute to designing programs that involve parents and the community in supporting adolescent mental health (Riazi et al., 2023). Parental involvement in school mental health programs can increase awareness and understanding of mental health issues within families.

6. Evaluation and Feedback

After the curriculum and system are implemented, it is important to conduct periodic evaluations to assess the program's effectiveness. This can be done through surveys of students, interviews with educators, and analysis of students' mental health data. Feedback from all stakeholders, including students, parents, and educators, is crucial for the continuous improvement of the curriculum and system that have been implemented (Agung F. et al., 2024). By conducting a systematic evaluation, schools can adjust their programs to better meet students' needs.

7. Implementation of a Holistic Approach

The application of a holistic approach to adolescent mental health is very important. This means that mental health programs should address various aspects, such as physical, emotional, social, and spiritual well-being. Physical activities, such as sports and arts, can be part of the curriculum that supports mental health (Kaligis et al., 2021). Additionally, activities that encourage social interaction and the development of social skills are also crucial. By creating a supportive environment, students will feel more comfortable sharing experiences and seeking help when needed.

8. Expanding Connections

Building a strong support network inside and outside the school is crucial for adolescent mental health. This includes creating partnerships with mental health organizations, government agencies, and local communities. By fostering good relationships with various parties, schools can provide better access to mental health services and resources needed to support students (Ellins et al., 2023). This support network can also help identify at-risk students and provide timely interventions.

## 5. Conclusion

This study demonstrates that technology, particularly through gamification approaches, holds significant potential in supporting efforts to mitigate adolescent mental health problems within educational settings. Interviews with educators confirmed that technology can enhance awareness, increase engagement, and provide easier access to mental health information and services. However, challenges remain, such as limited digital literacy, social stigma, and insufficient training for educators. The use of Learning Management Systems (LMS) and the integration of gamification elements have proven to encourage student participation in mental health programs while also enabling more systematic monitoring of students' conditions. With collaborative support from educators, system developers, mental health teams, and the involvement of parents and the community, the integration of technology into school-based mental health curricula has the potential to create an inclusive learning ecosystem that is responsive to adolescents' needs. Overall, this study emphasizes that technology should not only be seen as a supporting tool but also as an innovative strategy for building more effective, sustainable, and contextual mental health interventions in educational environments.

This research makes significant contributions to various areas, especially in education and mental health. The main contribution lies in developing an understanding of the role of technology in addressing mental health disorders among adolescents, which is a critical issue in the current educational context. With the increasing prevalence of mental health disorders among students, this study provides in-depth insights into how technology can be integrated into educational programs to support students' mental well-being. In addition, the results of this study can serve as a reference for educational practitioners and mental health professionals in designing more effective and technology-based interventions. Contributions can also be made in the policy field by providing evidence to

recommend curriculum development that emphasizes the use of technology as a tool in mental health education. This research also enriches the academic literature on the interaction between technology and education, paving the way for further research focusing on implementation aspects and innovative strategies in the educational space. As such, this study is not only relevant for educators and mental health professionals, but also for policy makers and researchers interested in teaching innovations and intervention approaches in mental health education.

## Limitations

This study has some limitations that need to be noted, which may affect the generalizability of the results obtained. One of the main limitations is the relatively small number of informants drawn from one particular educational context, so the results may not fully reflect the experiences or views of educators in other settings or regions. In addition, limitations in terms of time and resources also restricted the ability of the study to conduct more in-depth observations or collect data from more participants who could provide richer perspectives. Other limitations include potential biases in data collection, especially in interviews, where respondents may give answers influenced by researcher expectations or social norms. In addition, this study also focused on the perceptual and experiential aspects of technology use in the management of mental health disorders without fully exploring the effectiveness or outcomes of technology use, which may mean that indicators related to mental well-being outcomes were not explored in depth. As such, the results of this study should be accepted with consideration of these limitations, and further research is needed to gain a broader understanding of the application of technology in the context of adolescent mental health.

## References

- Ahmed, A., Ali, N., Giannicchi, A., Abd-alrazaq, A. A., Ahmed, M. A. S., Aziz, S., & Househ, M. (2021). Mobile applications for mental health self-care: A scoping review. *Computer Methods and Programs in Biomedicine Update*, 1. <https://doi.org/10.1016/j.cmpbup.2021.100041>
- Aisyaroh, N., Hudaya, I., & Supradewi, R. (2022). TREND PENELITIAN KESEHATAN MENTAL REMAJA DI INDONESIA DAN FAKTOR YANG MEMPENGARUHI: LITERATURE REVIEW. *Scientific Proceedings of Islamic and Complementary Medicine*, 1(1), 41–51. <https://doi.org/10.55116/spicm.v1i1.6>
- Aldalur, I., & Perez, A. (2023). Gamification and discovery learning: Motivating and involving students in the learning process. *Heliyon*, 9(1). <https://doi.org/10.1016/j.heliyon.2023.e13135>
- Alqithami, S. (2021). A serious-gamification blueprint towards a normalized attention. *Brain Informatics*, 8(1). <https://doi.org/10.1186/s40708-021-00127-3>
- Alruwaili, M. M., Shaban, M., & Elsayed Ramadan, O. M. (2023). Digital Health Interventions for Promoting Healthy Aging: A Systematic Review of Adoption Patterns, Efficacy, and User Experience. In *Sustainability (Switzerland)* (Vol. 15, Issue 23). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/su152316503>
- Andrea Fiorillo. (2024). *Mental Health Research and Practice: From Evidence to Experience* (Andrea Fiorillo, Peter Falkai, & Philip Gorwood, Eds.). Cambridge University Press.
- Aschentrup, L., Steimer, P. A., Dadaczynski, K., Mc Call, T., Fischer, F., & Wrona, K. J. (2024). Effectiveness of gamified digital interventions in mental health prevention and health promotion among adults: a scoping review. *BMC Public Health*, 24(1). <https://doi.org/10.1186/s12889-023-17517-3>
- Camlian, M. M., & Baron, J. V. (2025). Workplace health and safety, social support, and turnover intention in Private Higher Education Institutions in the Philippines. *Annals of Human Resource Management Research*, 5(1), 1–14. <https://doi.org/10.35912/ahrmr.v5i1.2661>
- Chen, T., Ou, J., Li, G., & Luo, H. (2023). *Promoting Mental Health in Children and Adolescents through Digital Technology: A Systematic Review and Meta-analysis*. <https://doi.org/10.37766/inplasy2023.12.0004>
- David Creswell, J. (2014). *Qualitative Research Method (Sixth Edition)*.
- Ellins, J., Hocking, L., Al-Haboubi, M., Newbould, J., Fenton, S. J., Daniel, K., Stockwell, S., Leach, B., Sidhu, M., Bousfield, J., McKenna, G., Saunders, C., O'Neill, S., & Mays, N. (2023). Implementing mental health support teams in schools and colleges: the perspectives of programme

- implementers and service providers. *Journal of Mental Health*.  
<https://doi.org/10.1080/09638237.2023.2278101>
- Fleming, T., Poppelaars, M., & Thabrew, H. (2023). The role of gamification in digital mental health. In *World Psychiatry* (Vol. 22, Issue 1, pp. 46–47). John Wiley and Sons Inc.  
<https://doi.org/10.1002/wps.21041>
- Gkintoni, E., Vantaraki, F., Skoulidi, C., Anastassopoulos, P., & Vantarakis, A. (2024a). Promoting Physical and Mental Health among Children and Adolescents via Gamification—A Conceptual Systematic Review. In *Behavioral Sciences* (Vol. 14, Issue 2). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/bs14020102>
- Gkintoni, E., Vantaraki, F., Skoulidi, C., Anastassopoulos, P., & Vantarakis, A. (2024b). Promoting Physical and Mental Health among Children and Adolescents via Gamification—A Conceptual Systematic Review. In *Behavioral Sciences* (Vol. 14, Issue 2). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/bs14020102>
- Hoover, K. (2010). *The Future of Identity*. Lexington Books.
- I-NAMHS: Indonesia-National Adolescent Mental Health Survey. (2022).
- Juliansen, A., Heriyanto, R. S., Muljono, M. P., Budiputri, C. L., Sagala, Y. D. S., & Octavius, G. S. (2024). Mental health issues and quality of life amongst school-based adolescents in Indonesia. *Journal of Medicine, Surgery, and Public Health*, 2, 100062.  
<https://doi.org/10.1016/j.glmedi.2024.100062>
- Kaligis, F., Ismail, R. I., Wiguna, T., Prasetyo, S., Indriatmi, W., Gunardi, H., Pandia, V., & Magdalena, C. C. (2021). Mental health problems and needs among transitional-age youth in Indonesia. *International Journal of Environmental Research and Public Health*, 18(8).  
<https://doi.org/10.3390/ijerph18084046>
- Krewski, D., Saunders-Hastings, P., Larkin, P., Westphal, M., Tyshenko, M. G., Leiss, W., Dusseault, M., Jerrett, M., & Coyle, D. (2022). Principles of risk decision-making. In *Journal of Toxicology and Environmental Health - Part B: Critical Reviews* (Vol. 25, Issue 5, pp. 250–278). Taylor and Francis Ltd. <https://doi.org/10.1080/10937404.2022.2107591>
- Kumar Ghosh, S., Kumar Sarker, B., Kumar Saha, S., Islam, A., Shakil, M., & History, A. (2021). Comparison of depression and anxiety levels among students: An observational study in Dhaka City. *Psychohealth: Scientific Journal of Psychology and Mental Health*, 1(1), 49–58.  
<https://doi.org/10.35912/psychohealth.v1i1.1661>
- Minerva, F., & Giubilini, A. (2023). Is AI the Future of Mental Healthcare? *Topoi*, 42(3), 809–817.  
<https://doi.org/10.1007/s11245-023-09932-3>
- Nirmalasari, L., & Minai, M. (2023). Role conflict and performance of part time students in Indonesia: The effect of burnout, coping behavior and spiritual intelligence. *Annals of Management and Organization Research*, 4(3), 239–249. <https://doi.org/10.35912/amor.v4i3.1645>
- Pandia, V., Novianhari, A., Amelia, I., Hidayat, G. H., Fadlyana, E., & Dhamayanti, M. (2021). Association of Mental Health Problems and Socio-Demographic Factors Among Adolescents in Indonesia. *Global Pediatric Health*, 8. <https://doi.org/10.1177/2333794X211042223>
- Pérez-Jorge, D., Martínez-Murciano, M. C., Contreras-Madrid, A. I., & Alonso-Rodríguez, I. (2024). The Relationship between Gamified Physical Exercise and Mental Health in Adolescence: An Example of Open Innovation in Gamified Learning. In *Healthcare (Switzerland)* (Vol. 12, Issue 2). Multidisciplinary Digital Publishing Institute (MDPI).  
<https://doi.org/10.3390/healthcare12020124>
- Pham, M. D., Sawyer, S. M., Agius, P. A., Kennedy, E. C., Ansariadi, A., Kagilis, F., Wiguna, T., Wulan, N. R., Devaera, Y., Medise, B. E., Riyanti, A., Wiweko, B., Cini, K. I., Tran, T., Fisher, J., Luchters, S., & Azzopardi, P. S. (2023). Foregone health care in adolescents from school and community settings in Indonesia: a cross-sectional study. *The Lancet Regional Health - Southeast Asia*, 13. <https://doi.org/10.1016/j.lansea.2023.100187>
- Purnomo, E. N., Imron, A., Wiyono, B. B., Sobri, A. Y., & Dami, Z. A. (2024). Transformation of Digital-Based School Culture: implications of change management on Virtual Learning Environment integration. *Cogent Education*, 11(1).  
<https://doi.org/10.1080/2331186X.2024.2303562>



- Quah, W. B. (2023). Enhancing online learning with Wakelet: A technology acceptance framework analysis. *Journal of Social, Humanity, and Education*, 3(4), 321–333. <https://doi.org/10.35912/jshe.v3i4.1473>
- Rani, S. (2025). Studying the impact of anxiety, stress, and emotion on academic performance: A systematic review. *Journal of Social, Humanity, and Education*, 5(2), 131–141. <https://doi.org/10.35912/jshe.v5i2.2437>
- Riazi, N. A., Battista, K., Duncan, M. J., Wade, T. J., Pickett, W., Ferro, M. A., Leatherdale, S. T., & Patte, K. A. (2023). Stronger together: Coping behaviours and mental health changes of Canadian adolescents in early phases of the COVID-19 pandemic. *BMC Public Health*, 23(1), 319. <https://doi.org/10.1186/s12889-023-15249-y>
- Riches, S., Taylor, L., Jeyarajaguru, P., Veling, W., & Valmaggia, L. (2024). Virtual reality and immersive technologies to promote workplace wellbeing: a systematic review. In *Journal of Mental Health* (Vol. 33, Issue 2, pp. 253–273). Taylor and Francis Ltd. <https://doi.org/10.1080/09638237.2023.2182428>
- Russmann, U. (2022). Designing Qualitative Research Design. In *The SAGE Handbook of Qualitative Research Design*. <https://doi.org/10.4135/9781529770278.n52>
- Sailer, M., & Homner, L. (2020). The Gamification of Learning: a Meta-analysis. *Educational Psychology Review*, 32(1), 77–112. <https://doi.org/10.1007/s10648-019-09498-w>
- Salcedo, Z. B. V., Tari, I. D. A. E. P. D., Ratsameemonthon, C., & Setiyani, R. Y. (2023). Artificial Intelligence and Mental Health Issues: A Narrative Review. *Journal of Public Health Sciences*, 2(02), 58–65. <https://doi.org/10.56741/jphs.v2i02.282>
- Sarwono, S. W. (2019). *Psikologi Remaja*. Rajawali Pers.
- Spanellis, A., & Harviainen, J. T. (2021). Transforming society and organizations through gamification: From the sustainable development goals to inclusive workplaces. In *Transforming Society and Organizations through Gamification: From the Sustainable Development Goals to Inclusive Workplaces*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-68207-1>
- Tangen, J., Runcorn, A. Q., & Hall, B. (2023). Developmental Trajectory of Teachers: A Theoretical Synthesis and Application to Counselor Education. *COUNS-EDU: The International Journal of Counseling and Education*, 8(1). <https://doi.org/10.23916/0020230841210>
- Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, 28(6), 6695–6726. <https://doi.org/10.1007/s10639-022-11431-8>
- Toda, A., Cristea, A. I., & Isotani, S. (2023). Gamification Design for Educational Contexts. In *Gamification Design for Educational Contexts*. Springer International Publishing. <https://doi.org/10.1007/978-3-031-31949-5>
- Uddin, Md. H., Ali, Md. H., & Hassan, M. K. (2020). Cybersecurity hazards and financial system vulnerability: a synthesis of literature. *Risk Management*, 22(4), 239–309. <https://www.jstor.org/stable/48743894>
- Vieira, C. R., & Pedro, N. (2023). Weaknesses of ICT integration in the initial teacher education curriculum. *Computers and Education Open*, 5, 100150. <https://doi.org/10.1016/j.caeo.2023.100150>
- Vogel, D. L. (2022). *The Cambridge Handbook of Stigma and Mental Health*. Cambridge University Press.
- Weng, J. H., Hu, Y., Heaukulani, C., Tan, C., Chang, J. K., Phang, Y. S., Rajendram, P., Tan, W. M., Loke, W. C., & Morris, R. J. T. (2024). Mental Wellness Self-Care in Singapore With mindline.sg: A Tutorial on the Development of a Digital Mental Health Platform for Behavior Change. *Journal of Medical Internet Research*, 26. <https://doi.org/10.2196/44443>
- Zerine, I., Biswas, Y. A., Doha, M. Z., Meghla, H. M., & Polas, M. R. H. (2025). Adoption of Artificial Intelligence in retail: Examining the impact of technological and organizational factors on customer retention and loyalty. *Annals of Management and Organization Research*, 6(3), 287–302. <https://doi.org/10.35912/amor.v6i3.2548>