

**IBN HALDUN UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF COUNSELING PSYCHOLOGY**

MASTER'S THESIS

**DEVELOPMENT AND EVALUATION OF A DIGITAL
AND AI-SUPPORTED SELF-REGULATED LEARNING
PROGRAM**

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ISTANBUL, 2025

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ACADEMIC HONESTY ATTESTATION

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ÖZ

DİJİTAL VE YAPAY ZEKÂ DESTEKLİ ÖZ-DÜZENLEMELİ ÖĞRENME
PROGRAMININ GELİŞTİRİLMESİ VE DEĞERLENDİRİLMESİ

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Bu çalışma, dijital ve yapay zekâ destekli Öz-Düzenlemeli Öğrenme (ÖDÖ) programının geliştirilmesi ve değerlendirilmesini amaçlamaktadır. Araştırmada, öğrenciler, rehberlik zümre başkanı ve okul yöneticileri ile yapılan görüşmeler yoluyla programın öğrenme süreçlerine etkisi incelenmiştir. ADDIE modeline dayalı olarak tasarlanan program, öğrencilerin öğrenme motivasyonunu artırmada ve öz-düzenleme becerilerini geliştirmede olumlu etkiler göstermiştir. Bununla birlikte, teknolojik adaptasyon ve eğitimcilerin desteklenmesi gibi bazı zorluklar da ortaya çıkmıştır. Araştırma, eğitimde dijitalleşmenin ve yapay zekânın öz-düzenlemeyi güçlendirmede önemli bir araç olduğunu göstermekte ve bu alanda uygulamalara rehberlik edecek bulgular sunmaktadır.

Anahtar Kelimeler: ADDIE Modeli, Dijital Araçlar, Dijital Eğitim, Eğitim Teknolojileri, Öz-Düzenlemeli Öğrenme, Öğrenme Motivasyonu, Yapay Zekâ.

ABSTRACT

DEVELOPMENT AND EVALUATION OF A DIGITAL AND ARTIFICIAL INTELLIGENCE-SUPPORTED SELF-REGULATED LEARNING PROGRAM

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This study aims to develop and evaluate a digital and AI-supported Self-Regulated Learning (SRL) program. Through interviews with students, the head of school counseling, and school managers, the study examines the program's impact on learning processes. The program, designed based on the ADDIE instructional design model, showed positive effects on increasing student motivation and enhancing self-regulation skills. However, challenges such as technology adaptation and the need for educator support were also identified. The research highlights the importance of digitalization and AI as key tools in strengthening self-regulated learning and provides insights to guide future implementations in education.

Keywords: ADDIE Model, Artificial Intelligence, Digital Education, Digital Tools, Educational Technology, Learning Motivation, Self-Regulated Learning.

DEDICATION

It is dedicated to my family, whose unwavering love and support have been my foundation, and to my cherished friends, Aslı and Büşra, who stood by me through my darkest times, offering strength and comfort when I needed it most. And to my dearest friend, who left this world far too young — your memory continues to inspire me every day.



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LIST OF SYMBOLS AND ABBREVIATIONS

ADDIE	Analysis, Design, Development, Implementation, Evaluation (Instructional Design Model)
AI	Artificial Intelligence
AI-powered	Artificial Intelligence-powered
MOOCs	Massive Open Online Courses
PLE	Personal Learning Environment
PLEs	Personal Learning Environments
SRL	Self-Regulated Learning



CHAPTER I

INTRODUCTION

1.1. Background of the Study

As a result of the rapid evolution of digital technologies and artificial intelligence (AI), learning environments have transformed and significantly affected students' participation in the learning process. Therefore, the concept of Self-Regulated Learning (SRL) has become one of the basic competencies required for independent learning and lifelong learning skills. Self-regulated learning skills promote autonomy and academic success by enabling students to plan, monitor, and evaluate their learning experiences (Zimmerman, 2002). In today's modern digital age, the use of artificial intelligence and digital tools has become a critical component that supports self-regulated learning by providing a personalized and adaptable learning process to meet the individual needs of students (Khalil, Wong, Wasson, & Paas, 2024).

AI-enabled learning resources such as generative AI chatbots, adaptive learning platforms, and smart tutoring systems provide scaffolding and real-time feedback to help students learn self-regulation (Wong and Viberg, 2024). Key components of SRL such as goal setting, metacognitive reflection, and self-assessment are facilitated by these technologies. According to research, students who struggle with self-regulation skills can benefit from AI-enabled self-regulated learning interventions tailored to their learning needs and behaviors (Prasad and Sane, 2024). Furthermore, digital storytelling has been found to be a successful strategy to promote self-regulated learning by helping students organize their knowledge and engage in reflective learning (Kaya, 2019).

Thanks to digital learning tools and artificial intelligence, it is now possible to create completely personalized learning paths for students according to their performance and areas where they are open to development. Unlike traditional classroom

environments, AI-supported SRL (Self-Regulated Learning) tools can take into account both the emotional and cognitive states of students and provide real-time suggestions and interventions to improve their learning (Ng, Tan, & Leung, 2024). This personalized learning method allows students to show more interest in the course, increase their motivation, and remember what they have learned better.

One of the characteristics of an AI-powered SRL program is that it allows students to adjust their own learning process in a way that suits them best. This flexibility is especially important in places like universities, where students have different responsibilities and schedules. Such platforms can set students up for a regular course, track their progress, and provide automatic feedback. In this way, the teacher does not have to be there all the time, and students can learn to work more comfortably and efficiently on their own (Wong & Viberg, 2024).

Despite these developments, challenges remain in effectively integrating AI and digital tools into SRL models. The most important of these is how to leverage these technologies to enhance self-regulated learning without increasing over-reliance on automation (Ng, Tan, & Leung, 2024). Students should be encouraged to actively engage with AI tools rather than passively relying on them to address learning issues. Furthermore, carefully addressing ethical issues such as data protection, algorithmic bias, and accessibility is essential to ensure that AI-based education is accessible and inclusive for all students.

Reiser and Dempsey (2017) emphasize that technological innovations in instructional design are rapidly transforming educational environments, with digital tools significantly impacting both teaching strategies and learning outcomes. The authors discuss emerging technologies, instructional strategies, and the challenges that educators face in implementing new technologies effectively.

Another issue that should be taken into consideration is that students have different socio-economic backgrounds, and their access to technology and digital literacy skills differ. Although AI and digital platforms support students' self-regulated learning, the level of impact of these tools depends on students' usage capacity and skills. Therefore, it is of great importance to ensure that AI-supported learning opportunities are

provided equally and fairly to all students, regardless of the technological infrastructure and proficiency levels of schools (Prasad & Sane, 2024).

As the use of artificial intelligence and digital tools in educational environments increases, the need to explore how these tools and artificial intelligence can positively enhance students' self-regulated learning skills is also increasing. Supporting students to become independent learners while also understanding the benefits and limitations, developmental aspects, and pedagogical effects of these technologies, namely artificial intelligence and digital tools, is a necessity in creating a valid educational framework. This study aims to contribute to a growing body of research in the context of AI-supported SRL by investigating the effects of a program designed to develop artificial intelligence and digital tool-supported self-regulated learning skills on students' motivation levels, learning outcomes, and future learning habits. It aims to identify best practices by addressing current limitations and developmental aspects to inform teachers, policymakers, and technology developers to maximize future artificial intelligence and digital tool-supported self-regulated learning interventions.

1.2. Statement of the Problem

Despite recent developments, there are still a number of challenges in properly integrating AI and digital tools into self-regulated learning skills. These challenges include algorithmic bias, equal technology access, data privacy, and preventing over-reliance on automation (Ng, Tan, & Leung, 2024). The digital divide is a significant barrier due to the significant differences in students' access to digital infrastructure and technological skills (Prasad & Sane, 2024). Pedagogically sound self-regulated learning programs that fully utilize AI and digital resources are necessary to provide effective support to diverse student groups and encourage active student participation.

1.3. Research Objectives

This study used the ADDIE instructional design model to create a program to develop digital and AI-supported self-regulated learning skills. The stages of the ADDIE model consist of 5 steps: Analysis, Design, Development, Implementation and Evaluation. This model provides a methodical approach to the program development process. In

the analysis phase, it can directly observe the needs of students and ensure the creation of engaging and accessible learning opportunities. This program aims to increase the impact and usability of the education provided through iterative implementation and evaluation processes. In this context, the ADDIE framework provides a solid research basis by integrating new technologies with best practices in education to develop students' self-regulated learning skills.

The aim of the study is to create a solid AI- and digital tools-supported SRL program and evaluate the impact of this program. In this context, it investigates the opinions of students, school guidance service counselors, and school administrators about the implementation and results of the program. This research provides important information about the sustainability, accessibility, and teaching elements of the program in real school environments. The results obtained will guide educators, developers, and policymakers who want to develop self-regulated learning with AI and digital tools.

1.4. Scope and Limitations

On the other hand, this study can be considered limited to a small area because it included only 7 students from a certain school's 9th grade high school, as well as the guidance service staff and school administrators of this school. Some factors, such as how comfortable the participating students are with technology, how accustomed they are to these digital tools, and how long the program has been implemented, may affect how the results obtained can be adapted to different environments. Despite all these limitations, this study makes an important contribution to the research on self-regulated learning supported by artificial intelligence and digital tools. This study shows how instructional design principles can be used to solve justice and ethical issues in digital education.

CHAPTER II

LITERATURE REVIEW

2.1. Self-Regulated Learning (SRL)

Self-Regulated Learning (SRL) means that students take control of their own learning process, set goals, monitor their progress, and change their plans as needed based on what they have learned. In short, it is a very important skill that allows students to learn on their own, stay motivated, and succeed in school (Zimmerman, 2002). Researchers in the fields of educational psychology, cognitive science, and digital learning environments have also closely examined SRL; thanks to this, SRL has a solid theoretical and empirical basis that can be applied in different learning situations.

Winne (2002) provides a comprehensive overview of the concept of self-regulated learning (SRL), offering both a theoretical perspective and an in-depth discussion of his SRL model. He defines self-regulated learning as a cyclical process involving goal-setting, self-monitoring, and self-reflection, which allows learners to actively control their educational experiences.

Zeidner and Stoeger (2019) describe self-regulated learning as a multifaceted process that involves goal setting, monitoring progress, and adjusting strategies, while also highlighting the emotional and motivational components that influence students' learning outcomes.

2.1.1. Theoretical Foundations of SRL

Cognitive and metacognitive learning theories explain how students can effectively manage and control their thoughts, motivations, and behaviors (Panadero, 2017). These theories form the basis of self-regulated learning (SRL). SRL does not view learning as a passive process of acquiring knowledge. Instead, it views it as a self-

directed, active process in which students plan, monitor, and reflect on what they have learned.

There are basic models that show how this works. Zimmerman's Cyclical Model consists of three parts that deal with SRL: first, setting goals and making plans (anticipation); second, monitoring progress and using strategies during learning (performance); and third, looking back on what has been done and changing plans for the next stage (self-reflection) (Zimmerman, 2002). According to Schunk and Zimmerman's Four-Stage Model, self-regulated learning (SRL) is an iterative process and includes determining tasks, setting goals, making plans, and self-monitoring (Schunk & Zimmerman, 1998).

Boekaerts' Dual Processing Model states that there are two different types of regulation: The first is goal-oriented regulation, which focuses on achieving learning goals; the second is emotion regulation, which is aimed at maintaining motivation and controlling emotions (Boekaerts, 2011). These models show that SRL is a constantly changing, iterative, and flexible process and that students constantly shape their thoughts, motivations, and behaviors during the learning process.

Cleary and Zimmerman (2004) developed a school-based program aimed at enhancing self-regulation and self-motivation in students, grounded in Zimmerman's SRL cyclical model. This study explores the "Self-Regulation Empowerment Program," a school-based initiative designed to enhance self-regulated learning (SRL) and self-motivation in students. The program aligns with Zimmerman's cyclical SRL model, emphasizing goal-setting, self-monitoring, and self-reflection. The research demonstrates that such interventions can successfully improve students' ability to regulate their own learning processes, making them more effective learners and intrinsically motivated to succeed academically. The program's effectiveness in school settings showcases the practical application of SRL theories in real-world educational contexts.

According to Zeidner and Stoeger (2019), successful self-regulated learning requires not only cognitive skills but also emotional regulation and self-motivation, which play a pivotal role in academic achievement.

Hadwin, Järvelä, and Miller (2018) discuss the critical role of self-regulation, co-regulation, and shared regulation in collaborative learning environments, underscoring the significance of these interactions in fostering effective self-regulation skills. It explores how students regulate their learning individually (self-regulation), how they support each other in regulating their learning (co-regulation), and how the learning process can be shared among peers in a group setting (shared regulation). The chapter also highlights the dynamic interactions that occur in collaborative environments and the ways in which co-regulation and shared regulation contribute to the development of self-regulation skills. It provides insights into the role of social and interactive learning in enhancing students' abilities to manage and monitor their learning effectively.

Pintrich (2004) discusses how motivation serves as a critical component in self-regulated learning, highlighting its essential role in influencing students' ability to set goals, monitor their progress, and engage in reflective learning practices.

According to Winne (2002), effective self-regulated learning relies on a continuous cycle of setting goals, monitoring progress, and adjusting strategies, which directly influences academic performance.

2.1.2. Components of SRL

Self-regulated learning (SRL) consists of different components that work together: cognitive, metacognitive, motivational, and behavioral factors. These factors allow students to control their own learning process (Panadero, 2017; Tinajero, Mayo, Villar, & Martínez-López, 2024). Students use various cognitive methods, such as summarizing, elaborating, and organizing information, to better understand and retain what they have learned (Peel, 2019). Among the metacognitive strategies, strategies such as self-monitoring and self-assessment are also very important. These strategies allow them to monitor their own learning process and change their methods if necessary (Lukes, Jones, & McConnell, 2020). Self-confidence, intrinsic motivation, and goal focus keep students engaged and enable them to continue learning. In addition, behavioral changes such as time management, creating a suitable study

environment, and asking for help when needed play an important role in developing students' independent learning skills (Stoeger, Fleischmann, & Obergruesser, 2015).

2.1.3. The Impact of SRL on Learning Outcomes

Self-regulated learning (SRL) significantly increases the likelihood that students will succeed academically, acquire new knowledge, and remain motivated throughout their lives (Theobald, 2021). Students who are proficient in SRL demonstrate superior academic performance due to their ability to effectively manage challenges and implement effective learning strategies (Winne, 2016). They have also been shown to be more resilient and persistent, especially when learning is difficult or self-paced (Verma, Ahuja, & Hermon, 2019). They also learn how to solve problems, which helps them perform better in school and at work (Ng, Tan, & Leung, 2024).

SRL is a critical element that enables students to learn independently and adaptably. The influence of SRL on academic achievement, motivation, and lifelong learning is evident in both theoretical models and practical research. The significance of SRL will grow as schools increasingly implement digital and AI-enabled learning aids. Consequently, research and practice in this field will also expand. Consequently, SRL is of paramount importance for both research and application.

Broadbent and Poon (2015) systematically review the relationship between self-regulated learning strategies and academic performance in online learning, concluding that well-developed SRL skills directly correlate with better academic outcomes, which aligns with the findings of improved academic achievement in our study.

Zimmerman and Schunk (2001) highlight the importance of self-regulation in academic success, emphasizing that students' ability to plan, monitor, and reflect on their learning directly influences their achievement outcomes. SRL not only helps in achieving academic goals but also plays a critical role in fostering long-term academic success by enhancing students' metacognitive skills and self-motivation (Zimmerman & Schunk, 2001).

2.2. The Connection between Digital Tools, Artificial Intelligence, and Self-Regulated Learning (SRL)

Self-Regulated Learning (SRL) has become an important topic in education because students have observed that it helps them become more successful, helps them become aware of their own learning processes, and supports their independent learning (Zimmerman, 2002). In addition, digital technologies and artificial intelligence (AI) personalize students' learning experiences by providing personalized feedback and play a major role in supporting self-regulated learning by providing intelligent tutoring systems (Khalil, Wong, Wasson, & Paas, 2024). This study examines the effects of digital technology and artificial intelligence on self-regulated learning and how this is reflected in learning outcomes and self-regulated practices.

Reiser and Dempsey (2017) highlight that the integration of digital tools and AI in self-regulated learning programs is reshaping how students engage with content and manage their learning, aligning with the increasing shift towards personalized learning environments.

2.2.1. Digital Tools and SRL

Digital tools such as smart tutoring systems, online study platforms, and learning management systems help students set their own goals, see how far they have come, and reflect on what they have learned. In this way, students develop their SRL (self-regulated learning) skills while learning both independently and interactively (Verma, Ahuja, & Hermon, 2019). Digital storytelling is also a very useful tool because it helps students organize their information, evaluate what they have learned, and track their progress (Kaya, 2019).

One of the best aspects of digital tools for SRL is that they provide students with personalized learning opportunities. Digital platforms can track students' performance and make suggestions according to their needs. In this way, students can change their learning styles according to the feedback they receive instantly (Ng, Tan, & Leung, 2024). For example, AI-powered digital note-taking applications make it easier for students to keep their notes more organized and review, thus improving their self-

regulated learning (Calamlam, 2023). Research also shows that online courses that offer tools such as goal setting and progress tracking dashboards are very helpful for students to better manage their learning (Krauel-Nix, Evans, Eckstein, & McMurry, 2019).

Dabbagh and Kitsantas (2012) investigates how personal learning environments (PLEs) and social media can support self-regulated learning (SRL), offering a natural connection between formal and informal learning contexts. The authors argue that PLEs, which include digital tools, social media, and online resources, provide a flexible and personalized approach to learning. By leveraging social media and other digital platforms, students can extend their learning beyond traditional classroom settings, creating a more engaging and self-directed educational experience. The paper emphasizes that integrating personal learning environments into SRL promotes both autonomy and motivation, as students can control their learning process through the tools they prefer and interact with peers for collaborative learning experiences.

2.2.2. AI and SRL: Enhancing Personalized Learning

AI has completely changed the learning process of students through intelligent tutoring systems, predictive analytics, and generative AI applications. For example, adaptive chatbots and recommendation systems help students better control their own thoughts by providing personalized feedback (Wong and Viberg, 2024). Prasad and Sane (2024) say that generative AI tools such as ChatGPT help students learn on their own by providing automatic feedback, summarizing important points, and breaking difficult tasks into pieces.

A recent study (Ng, Tan, and Leung, 2024) showed that AI-powered study tools help teach science subjects to students in a more engaging and exciting way. Similarly, AI-powered lesson plans have enabled students to better manage their own studies by providing intelligent feedback and structured learning paths in animated lessons (Lee and Li, 2024). In addition, artificial intelligence-based coaching systems and digital assistants have been developed that provide support to students in setting goals, monitoring their progress, and evaluating their learning processes (Scheu and Benke, 2022).

2.2.3. Challenges and Considerations

AI and digital tools can support self-regulated learning, but there are some areas that need improvement. One of the biggest concerns is that AI will allow students to truly control their own learning, rather than doing everything automatically (Prasad & Sane, 2024). In addition, ethical issues such as the protection of personal data and the neutrality of algorithms in AI-based learning environments should be well considered. This way, AI can be used fairly and beneficially (Wong & Viberg, 2024).

Another problem is that all students have different abilities to use digital tools to control their own behavior. Some students may have difficulty using artificial intelligence in the learning process. Therefore, it can be said that students need more support in the field of digital literacy and should receive training in this area (Calamlam, 2023). Artificial intelligence can improve personalized learning, but the quality of the feedback given and how well it is compatible with the best teaching methods should be examined well (Verma, Ahuja, & Hermon, 2019).

Digital tools and AI greatly enhance self-regulated learning by providing personalized learning paths, adaptive feedback, and intelligent support systems. Research shows that adaptive study tools, AI-powered chatbots, and digital storytelling significantly facilitate students' self-directed learning. However, ethics and teaching methods need to be considered to ensure that these AI-based, self-regulated learning skills are truly developed. As the digital transformation continues in our age, more research is needed to improve AI applications and create self-directed learners and improve their digital learning spaces.

2.3. Self-Regulated Learning (SRL) Programs: Courses, Workshops, and Training Interventions

Many schools and educational settings have used self-regulated learning programs, such as courses, workshops, and educational interventions, to help students better manage their own learning. When you look at the goal of these programs, they help students become more aware of their own thoughts, increase their motivation, and teach them how to control their own behavior. This process can ultimately help

students perform better in school and learn for the rest of their lives (Zimmerman, 2002). This literature review looks at how well different types of self-regulated learning programs work and how researchers have used them to promote self-regulated learning.

2.3.1. SRL Workshops and Short-Term Training Interventions

Students can gain basic knowledge about self-regulated learning strategies through numerous workshops and short-term training programs. Studies also show that even short interventions can help students manage their own learning processes. For example, a study conducted by Maleki, Picolo, and Verrett (2018) looked at the results of a 50-minute workshop on SRL and found that this work made students more confident and helped them revise better before lessons. However, they also show that a one-time intervention may not be enough to maintain behavioral changes over time. Ganda and Boruchovitch (2018) conducted another study examining a self-reflection workshop organized for Brazilian pre-service teachers. The results showed that those who participated in the workshop were more confident in their abilities and used their learning paths better than those who only received theoretical training. This shows how important structured reflection is in SRL workshops.

2.3.2. Online SRL Courses

With the increasing prevalence of digital education in educational environments, online self-regulated learning (SRL) courses have been developed to support students in gaining self-regulation skills in a more structured way. Krauel-Nix, Evans, Eckstein, and McMurry (2019) designed an interactive online SRL course to develop the metacognitive skills of individuals learning English. In addition to providing students with goal-setting skills, the course also provides tools that allow them to monitor their own learning processes and provides students with personalized feedback to help them become more engaged and independent learners.

Theobald (2021) conducted a meta-analysis examining long-term SRL training programs at online colleges and universities. The results show that SRL programs improve students' metacognitive skills while also greatly improving time management

and motivation. The best programs include regular feedback and goal-setting techniques.

Artino and Stephens (2009) investigate the differences in academic motivation and self-regulation between undergraduate and graduate students in online learning environments. They found that undergraduate students exhibit lower levels of self-regulation compared to graduate students in online learning environments, suggesting that the complexity of self-regulation increases with academic progression, which is essential when designing SRL interventions tailored to various educational levels.

Broadbent's (2017) study compares the self-regulated learning (SRL) strategies and academic performance of first-year university students in online and offline learning environments. This research provides valuable insights into how SRL strategies can vary depending on the learning environment. The study shows that students in online settings often develop more independent learning behaviors and make greater use of self-regulation strategies than those in traditional classroom environments. This distinction highlights the potential benefits of incorporating digital tools and platforms into educational settings to foster self-regulated learning.

2.3.3. SRL in Discipline-Specific Courses

Additionally, some academic fields are adding artifacts programs to help students learn. For example, Ramírez Echeverry, Rosales-Castro, Restrepo-Calle, and González (2018) looked at students' self-regulated learning skills in a computer programming class and found that students who used self-regulated strategies performed better in school. They included a structured self-assessment and guided reflection to help students learn how to control themselves.

Calamlam (2023) investigated how digital note-taking tools could be used most effectively in a business mathematics course focused on self-regulated learning. The results showed that students who took more structured notes using digital tools were more successful in academic activities and performance and had better self-control than those who did not.

2.3.4. SRL Training in Teacher Education

SRL programs are crucial to teacher training because they help teachers find ways to teach that will help them learn on their own. Krismanto and Tahmidaten (2022) looked at how SRL has grown in online teacher training programs. They emphasized the importance of integrating design elements that encourage self-reflection and self-monitoring in lessons.

Marian and Garcias (2016) used Moodle workshops to create a collaborative e-assessment activity for pre-service teachers to assess themselves and their peers. This research showed that SRL can be enhanced by encouraging future teachers to think more about their own learning.

2.3.5. Self-Regulated Learning in Massive Open Online Courses (MOOCs)

A lot of research has been done on the role of SRL in Massive Open Online Courses (MOOCs) because these courses require a lot of independence from the students. Milligan and Littlejohn (2014) looked at SRL behaviors in a Harvard MOOC on Clinical Trials and found that students who were better at self-regulation were more likely to finish the course successfully. The study suggested that MOOCs should include self-regulation tools, like goal-setting tools and progress-tracking features, to help students who aren't as good at self-regulation.

2.3.6. Effectiveness of SRL Programs: Meta-Analytic Insights

There have been many studies conducted investigating the effects of self-regulated learning (SRL) programs on learning outcomes in various school types. Guntur and Purnomo (2024) conducted a meta-analysis examining SRL interventions in online and blended learning environments. Based on the specific factors they examined, they found that SRL strategies had a moderate effect on learning outcomes ($Q = 0.65$). This highlights the importance of structured interventions. The study found no major differences in effectiveness based on course type, school level, or learning environment. However, it was noted that more studies are needed to find out how SRL

skills such as personalized feedback and peer interaction affect student engagement and academic performance.

According to a study conducted by Theobald (2021), the training provided at the university to develop self-regulated learning skills significantly increases the academic success of students, especially when they learn more clearly how to manage their thinking and learning processes.

According to research in this area, self-regulated learning programs help students manage their own learning more independently and perform better in school. There are many benefits such as online SRL courses, field-based interventions, teacher training programs, and especially personalized feedback, thinking exercises, and adaptive learning technologies. Researchers should continue their work to make SRL programs more effective in various learning environments such as AI-supported digital platforms.

Dignath, Buettner, and Langfeldt (2008) argue that effective self-regulation training programs for primary school students significantly enhance their ability to manage and direct their learning processes through strategies such as goal-setting, self-monitoring, and feedback. This meta-analysis synthesizes studies on self-regulation training programs aimed at primary school students. It provides a comprehensive examination of the effectiveness of various SRL training strategies, specifically focusing on how young students can learn and apply self-regulated learning techniques most effectively. The analysis indicates that SRL programs, when tailored appropriately for young learners, can significantly enhance their ability to manage their learning, develop time-management skills, and improve academic performance. The study further discusses the key elements of successful SRL programs, including goal-setting, self-monitoring, and feedback, which help students develop metacognitive awareness and autonomy in their learning processes.

CHAPTER III

METHODOLOGY AND IMPLEMENTATION

3.1. Introduction

This section includes detailed information on the purpose, problem, and method of the research; research topic and research questions; study group; data collection tools and data collection processes; data breakdown and analysis, sample, research assumptions, limitations, and validity.

3.2. Research Objective

The purpose of this study is to examine the opinions and experiences of psychological counselors working in the school guidance service and school administrators regarding the development and evaluation of an AI and digitally supported self-regulated learning program among 9th grade high school students. The study aims to explore how AI and digital tools support SRL education and how they affect students' motivation and academic success in general, as well as how this program contributes to sustainable education practices.

The following research questions guide this study:

- i. What educational components should be included in a digital and AI-supported SRL program?
- ii. How do students perceive and experience the digital and AI-supported SRL program?
- iii. What are the views and experiences of school counseling staff regarding the digital and AI-supported SRL program?
- iv. What are the views and experiences of school managers regarding the digital and AI-supported SRL program?

3.3. Importance of the Study

Self-regulated learning is a very valuable skill that allows people to plan, monitor and evaluate their own learning processes. Digital technologies and artificial intelligence also greatly support students in developing this skill. However, it is also very important to conduct research on how these technologies are used in education and their long-term effects on students.

This study aims to provide important information on the effects of digital and artificial intelligence-supported programs on self-regulated learning and to guide educators, policymakers, and educational technology developers.

3.4. Research Assumptions

The study is based on several basic assumptions. First, it is assumed that participants will share honest and candid views about their experiences with self-regulated learning (SRL) and digital learning. Second, it is assumed that the combination of semi-structured interviews and document analysis will fully meet the aims of the study. Finally, it is assumed that digital and AI-supported SRL programs increase students' motivation and contribute positively to academic success.

3.5. Research Limitations

This study has some limitations. First, the sample was limited to students, counselors, and administrators at a single educational institution, so different perspectives may not be fully reflected. Furthermore, the data collection was based on semi-structured interviews and document analysis, which may limit the information obtained. Finally, the findings are based solely on the responses of the participants, which makes it difficult to generalize the results and requires further research to confirm them.

3.6. Sample

This study used a purposive sampling method to select participants directly involved in the Self-Regulated Learning (SRL) program implemented in a secondary school.

The sample included 11 people: 7 students, 2 school counselors, and 2 school administrators.

All the students were 9th grade students; 4 of them were male and 3 were female. The students' views provide important information about the student experience of the SRL program.

Among the counselors, there was a 33-year-old female school counselor head who was responsible for the supervision of counseling services, and another counselor who was 27 years old and actively worked with students within the framework of SRL and was responsible for the implementation of the program.

The administrative team includes a 50-year-old male principal and a 40-year-old male assistant principal. Both have taken an active role in making strategic choices and implementing and running the program.

Participants were selected because they were involved in different stages of the Self-Regulation and Learning Program. My examples are intended to illustrate different perspectives from students, guidance staff, and school administration.

3.7. Data Collection Process

This study adopts a qualitative research approach and data is collected from 3 main sources.

3.7.1. ADDIE Instructional Design Process

In this study, the ADDIE instructional design model was used to develop a self-regulated learning program supported by digital tools and artificial intelligence. This model consists of 5 steps, namely analysis, design, development, implementation, and evaluation (Molenda, 2003). The ADDIE model provides a systematic framework for creating and presenting effective educational programs (Gustafson and Branch, 2002). This approach ensures that the program is carefully designed, developed, and implemented in order for students to get the most out of the self-regulated learning

program and to develop their SRL skills. Allen critiques the traditional ADDIE model and advocates for the Successive Approximation Model (SAM) as a more agile, iterative approach to instructional design (Allen, 2012). While ADDIE provides a structured approach, Allen (2012) suggests that more agile models, like SAM, offer increased flexibility and iterative development, which may be better suited for modern educational needs where adaptability and speed are crucial. Molenda (2003) critically examines the evolution and ongoing relevance of the ADDIE model in instructional design, noting its widespread use despite some challenges in adapting to contemporary educational needs.

- Analysis:

The first stage of the model, the analysis, is to determine the need for a digital and artificial intelligence-supported SRL program. A gap analysis was conducted by the school guidance service for the difficulties experienced by students, especially in managing their learning, time management, goal setting, and self-assessment issues such as taking notes. As a result of these analyses, it was determined that many students were unable to effectively maintain their learning progress and that they lacked self-monitoring and self-regulation skills. In addition, the resources available on how digital tools and artificial intelligence could solve these problems were evaluated, and it was ultimately decided to create a personalized learning experience that would support independent and proactive learning.

- Design:

In the design phase, a detailed plan was created for the SRL program by focusing on both teaching strategies and digital tools to be used. The primary goals of the program were defined as goal setting, progress monitoring, thinking about learning, time management and note-taking techniques, and effective listening skills. Various digital tools and artificial intelligence technologies were incorporated into the program to achieve these goals. For example, Canva was used to design visually appealing teaching materials, while Nearpod and Webjets were included in the program to create interactive, engaging lessons that would increase student engagement. Miro mind map was used to help students organize and visualize their learning goals and strategies. At

the same time, applications such as Mentimeter and Padlet were used during the engagement and evaluation phase of the training to collect real-time feedback from students and conduct brainstorming. These digital tools were selected to provide personalized feedback, adaptive learning experiences, and interactive content that supports the development of SRL skills.

- Development:

The development phase also includes integrating the applications determined during the design phase of the program into the training. This process includes content creation, integrating the selected digital tools into the training program, and platform coding. Some artificial intelligence algorithms, mostly ChatGPT, were used to provide special training paths for students and to adjust the materials according to individual performance. When looking at the digital tools used in the development phase, Nearpod is used to provide real-time assessments, while Mentimeter allows live student participation during the lessons. Canva designs were used to make the students' attention and the training environment more attractive. Padlet application was used in the phase of receiving feedback from students at the end of the lesson and evaluation. Miro mind maps were also used to ensure that students could better understand the subject during the training. Small prototypes were created at this stage, and this training package developed with a small group of students was tested to collect initial feedback. This preliminary preparation was very helpful in adjusting the tools and content and making fine-tuning before moving on to full implementation.

- Implementation:

In the implementation phase, the training program created in the analysis, design, and development processes was presented to the target student group. A psychological counselor working in the school guidance service was held responsible for the presentation of the program. This guidance teacher was trained to facilitate the implementation of the program, provide support to students, ensure that they navigate the platform smoothly, and effectively manage support resources, including frequently encountered problems. All students were provided with access to the necessary devices and were informed about the effective use of these tools. In this phase, real-time data

on student participation and performance were collected in order to evaluate the effectiveness of the program.

- Evaluation:

Finally, the effectiveness of the program was examined with qualitative data during the evaluation phase. The impact of the program on students' self-regulation skills was understood through interviews with students, guidance counselors, and administrators. In addition, the documents created by students during the education process and performance data obtained from digital tools such as Padlet, Nearpod, and Mentimeter were analyzed to evaluate how much students were interested in the material and how successful the AI-supported interventions were. In line with the feedback and data received, improvements were aimed to be made in the program to increase student success and ensure the sustainability of the program in the long term.

3.7.2. Interviews

Semi-structured interviews were conducted with the participants to obtain in-depth information about their knowledge, experiences, and recommendations regarding the SRL program.

3.7.3. Document Analysis

Students' notes and documentation of the process were analyzed during the program. Interviews were conducted face-to-face in the school, recorded, and later transcribed for analysis.

3.8. Research Methodology

This research employed a case study design. Case studies facilitate a thorough and detailed analysis of a particular occurrence (Yıldırım & Şimşek, 2021). This study examines the experiences of students, school psychological counselors, and administrators participating in the SRL program, offering a comprehensive analysis.

The semi-structured interview method was utilized for data collection. This approach permits participants to articulate their ideas comprehensively while enabling the researcher to concentrate on the research enquiries (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2014).

Furthermore, document analysis was employed to scrutinise school reports, student evaluations, and program implementation papers. Document analysis facilitates the identification of essential themes and patterns pertinent to the study (Miles & Huberman, 2021).

3.9. Data Analysis

Qualitative data were examined through descriptive and content analysis methodologies. Descriptive analysis entailed summarizing the gathered data according to established themes (Patton, 2018), while content analysis facilitated the identification of primary themes and subthemes through the methodical categorization and coding of interview transcripts and documents.

The data analysis process included:

- i. Transcription of interview recordings.
- ii. Thematic analysis, categorizing responses into key themes.
- iii. Direct quotations from participants to support findings.

3.10. Validity and Reliability

Several important steps were taken to ensure the validity and reliability of the study. First, the data collection tools were reviewed by experts in the field and necessary adjustments were made. In addition, after the interviews were completed, summarized responses were sent to the participants to confirm their accuracy. Finally, the data were coded by independent researchers to check consistency during the analysis process.

CHAPTER IV

FINDINGS

This section presents the key findings of the study, which explores the effects of the digital and AI-enhanced Self-Regulated Learning (SRL) program. The results are organized around the research questions (RQ) and the main themes identified during data collection. Each research question is followed by an exploration of these themes, providing insights into the experiences and perspectives of students, counseling staff, and school administrators.

4.1. RQ1: ADDIE Process

The ADDIE model (Analysis, Design, Development, Implementation, Evaluation) is a widely used framework in instructional design, helping to create and deliver effective educational programs. In this study, the ADDIE model was used to develop a digital and AI-supported Self-Regulated Learning (SRL) program, focusing on enhancing students' ability to self-regulate their learning. This section presents the findings based on the application of each phase of the ADDIE model.

4.1.1. Analysis

The first phase, Analysis, involved identifying the learning needs and challenges faced by students. The need for a structured program that supports goal-setting, time management, and self-monitoring was evident, as students struggled to manage their learning effectively. The analysis phase was pivotal in understanding these challenges and designing a program to address them.

CI: "Many students were struggling with time management and keeping track of their goals. We identified that a structured program could help them be more accountable in their learning."

A1: “We found that students didn’t know how to regulate their learning. There was a gap in their ability to set clear learning goals and monitor their progress.”

The analysis phase identified key issues in students' learning processes that the SRL program aimed to address. It highlighted the need for a program that would help students improve their organizational and self-regulation skills, a necessity identified by both counselors and administrators.

4.1.2. Design

During the Design phase, instructional strategies and digital tools were selected to create an engaging and interactive learning environment. Tools like Canva, Padlet, and Miro Mindmap were chosen to help students plan, organize, and track their learning. The program's design aimed to make self-regulation a more interactive and personalized process for students.

P3: “Using Canva for visualizing my goals was very helpful, and Padlet helped me track my progress on a daily basis.”

A2: “We wanted to make sure the students had access to engaging, user-friendly tools. Canva and Miro Mindmap worked perfectly for goal setting and planning.”

The Design phase involved carefully selecting tools that would enhance engagement and support students' self-regulation. These tools were perceived as valuable in helping students organize their thoughts and track their progress. The positive feedback from students regarding the usability of these tools suggests that they contributed significantly to the program's effectiveness.

4.1.3. Development

The Development phase focused on creating and integrating the chosen digital tools and AI features into the SRL program. The AI-powered systems were designed to offer real-time feedback, personalized learning paths, and adaptive learning experiences.

The development process also included creating the content and ensuring the AI tools worked seamlessly with the program.

P2: “At first, I didn’t understand how the AI would help, but as I used it, I realized it gave me feedback and advice right when I needed it.”

C2: “The AI tools adapted to the students’ progress and provided suggestions to improve. This feature was critical in helping them stay on track.”

The Development phase highlighted the importance of incorporating AI-driven tools to provide immediate and personalized feedback. This feedback loop helped students better manage their learning processes, especially in areas where they faced challenges such as time management and goal setting. The use of AI tools created a more individualized learning experience, which contributed to greater student engagement and motivation.

4.1.4. Implementation

The Implementation phase involved rolling out the program to students, ensuring that they had the necessary devices and training to use the digital tools. Although some students initially faced technical difficulties, the program was implemented successfully, with close monitoring and support provided to address any challenges.

P1: “I had some trouble with the technology at first, but after a couple of sessions, I felt more comfortable.”

A2: “The initial feedback showed that some students struggled with the technical aspects, but with support, they were able to adapt quickly.”

The Implementation phase revealed that while technical challenges initially hindered the smooth integration of the tools, students gradually adapted to the program. The need for proper training and support during this phase was essential for ensuring that the program could be used effectively by all students.

4.1.5. Evaluation

The final phase, Evaluation, focused on assessing the effectiveness of the SRL program. Feedback was gathered from students, counselors, and administrators through interviews and digital platforms like Nearpod and Mentimeter. The data collected helped refine the program and improve its overall impact.

P5: “The program definitely helped me stay more focused and organized. I can track my progress and see where I need to improve.”

C1: “We saw significant improvement in students' engagement and learning outcomes. The feedback we gathered was invaluable in refining the program.”

The Evaluation phase demonstrated that the program had a positive impact on students' self-regulation skills. The feedback indicated that students felt more in control of their learning and appreciated the real-time assessments. The continuous evaluation process allowed for adjustments to be made, further improving the program's effectiveness.

The ADDIE model was effectively applied to design and implement the SRL program, with each phase contributing to its overall success. The findings suggest that students, counselors, and administrators found the program beneficial in supporting self-regulation skills, with digital tools and AI features playing a crucial role in its success. However, the challenges faced during the implementation phase highlight the importance of providing adequate training and support to ensure smooth adoption and long-term sustainability of the program.

4.2. RQ2: Learner Views & Experiences

This section discusses the common themes that emerged from the interviews conducted with students regarding their experiences with the Digital and AI-supported Self-Regulated Learning (SRL) program. The findings from these interviews are organized into several key themes that reflect the impact of the program on student motivation, engagement, and learning strategies.

4.2.1. Theme 1: Time Management and Efficiency

One of the most significant outcomes of the SRL program was its impact on students' time management and overall efficiency. Many students reported that after using the program, they were able to manage their time more effectively and efficiently.

P1: *“Time management was very helpful. Before, I felt like I had to study for two hours, but now I can use my time more efficiently.”*

P1's response highlights a transformation in their study habits. Initially, they felt pressured to study for long periods, but after using the SRL program, they were able to use their time more effectively. This mirrors a common sentiment expressed by other students, suggesting that the program provided them with strategies to manage their time without feeling overwhelmed.

P2: *“Digital tools really make our job easier. For example, I can type much faster on the computer when taking notes. This allows me to use my time more effectively.”*

P2 emphasizes the time-saving benefits of using digital tools. Their ability to take notes faster on the computer demonstrates how technology can streamline learning tasks. This aligns with P3's sentiment, who also expressed that digital tools, particularly computers, helped improve time efficiency. Both P2 and P3's comments suggest that digital tools allowed them to complete tasks more quickly, reducing inefficiencies.

P3: *“I used to struggle with managing my time and spend too much time on my phone. But now I can organize my time better.”*

P3 reveals that they struggled with distractions, particularly from their phone, prior to engaging with the SRL program. However, after learning time management strategies, they were able to organize their time better. This shift indicates that the SRL program not only helped students become more aware of their time usage but also equipped them with the tools to minimize distractions and focus on their academic tasks.

P4: *“I learned how to use my time more efficiently. I used to waste a lot of time, but now I work in a more focused manner.”*

P4’s statement reinforces the overall theme of increased efficiency. By becoming more focused and intentional with their time, P4 was able to improve their work habits significantly. The ability to focus on tasks is often cited as one of the key benefits of self-regulation, with students reporting that they could engage more deeply with their learning materials (Zimmerman, 2002).

P7: *“I plan my time better now and can do more things.”*

P7 reflects on how they gained more control over their schedule and were able to accomplish more tasks. This shift in mindset and planning is crucial, as it demonstrates that the SRL program not only improved the way students allocate time for their studies but also helped them achieve more in both academic and personal spheres.

As reflected in the quotes above, the SRL program had a profound effect on students' time management. Prior to the program, many students struggled with organizing their study time, often leading to procrastination or inefficiency. However, after engaging with the SRL tools, students reported an improved ability to organize their learning schedules, allowing them to study in a more structured and focused manner. They also mentioned using digital tools such as computers and note-taking applications, which helped them manage tasks faster and more efficiently.

The results highlight a common theme in SRL literature, which stresses the importance of effective time management as a key component of successful self-regulation. Time management is often cited as essential in helping students maintain focus, set clear learning goals, and avoid procrastination, all of which are important for academic success (Zimmerman, 2002). The ability to allocate time efficiently not only enhances students' productivity but also their academic outcomes (Panadero, 2017). The SRL program’s integration of digital tools likely contributed to these improvements by providing students with platforms that encouraged organization, focus, and adaptive learning.

Moreover, the positive feedback from students such as P1, P2, and P4 suggests that the SRL program did not just help them allocate time more effectively but also empowered them to make better decisions about how they spent their time. This aligns with research that suggests using digital tools and AI to support self-regulation can reduce inefficiencies and enhance learning experiences (Ng, Tan, & Leung, 2024). As students become more adept at managing their time, their motivation and academic performance tend to improve, which was evident in this study.

In conclusion, the SRL program appears to have equipped students with the necessary skills and tools to manage their time more efficiently, allowing them to balance their academic responsibilities and extracurricular activities effectively. This development not only led to improved academic performance but also helped foster a sense of control over their learning process. Future studies could explore the long-term impact of these time management skills on students' academic trajectories, particularly in self-paced learning environments.

4.2.2. Theme 2: Increased Engagement and Motivation

Another prominent theme was the significant increase in students' motivation and engagement with their learning. The use of digital tools, AI, and personalized learning experiences enhanced students' engagement with their academic tasks. The integration of these tools helped create a more interactive and motivating learning environment, which encouraged students to take a more active role in their learning process.

P6: "I started approaching lessons with less stress. Now, by planning everything better, I look at lessons in a more stress-free and positive way."

P6's experience highlights the emotional and psychological benefits of the SRL program. The reduction in stress and the shift to a more positive and relaxed mindset is an essential aspect of motivation. By introducing structured planning and time management, the program allowed P6 to feel more in control of their studies, which, in turn, helped them engage more effectively with the content.

P2: *"I became more efficient in my studies because my study system and routine changed."*

P2 emphasizes how the SRL program improved their efficiency. This aligns with P6's perspective on how their approach to studying became more focused and structured. Both P2 and P6 indicate a transformation in their study habits, which resulted in better time management and a more productive learning process. These observations demonstrate how the program helped students develop better organizational skills, which is crucial for motivation and engagement.

P3: *"Especially my interest in biology and chemistry increased. I didn't have much enthusiasm for science subjects before, but thanks to digital tools and AI, my interest in these subjects grew."*

P3 highlights a significant shift in attitude toward subjects that they previously found less engaging, such as biology and chemistry. This is particularly interesting because it shows that the SRL program, with its use of digital tools and AI, had a direct impact on the student's academic interest and motivation. In contrast, P5 shared a similar sentiment about increasing their interest in lessons, but through a more personal lens, stating: *"Before, I would play games when I got bored, but now I prefer to watch lessons."* This further underscores the power of digital tools in maintaining focus and increasing academic engagement.

P5: *"My interest in my lessons increased. Before, I would play games when I got bored, but now I prefer to watch lessons."*

P5's reflection also speaks to the influence of digital tools on student behavior. The shift from playing games to actively engaging with lessons suggests that the tools not only improved academic engagement but also provided an alternative to distractions. This demonstrates that the SRL program fostered a greater sense of responsibility and interest in academic tasks, as students found more stimulating ways to learn.

P7: *"I was successful in exams, which boosted my motivation."*

P7 underscores the connection between academic success and motivation. According to Pintrich (2004), motivation significantly enhances students' self-regulated learning processes, which is evident in the increased intrinsic motivation and academic engagement observed among students in the study. The feedback they received from exam performance acted as positive reinforcement, boosting their motivation to continue engaging with the program. This finding aligns with existing research in educational psychology, where performance and achievement play a critical role in enhancing motivation (Zimmerman, 2002).

The SRL program clearly had a profound impact on students' motivation and engagement with their learning, with the integration of digital tools and AI playing a crucial role. As seen in the quotes above, students like P3 and P5 expressed increased interest in subjects they previously found difficult or boring, suggesting that the tools used in the SRL program made these subjects more engaging. Similarly, P6's comments on reduced stress and better planning highlight how the program facilitated a positive shift in students' approach to learning, making it less overwhelming and more manageable.

Moreover, P2 and P6's focus on better time management, paired with P7's experience of increased motivation due to academic success, further confirms that the SRL program not only improved organizational skills but also had a direct impact on student performance. This finding aligns with the literature on SRL, which asserts that enhanced time management and from this theme are in line with research by Ng, Tan, & Leung (2024), who argue that AI and digital tools enhance student engagement by making the learning experience more personalized and interactive. The SRL program effectively combined technology with self-regulation strategies, helping students stay motivated and engaged. It also contributed to a more organized approach to learning, which led to improved academic performance and a deeper connection to their educational tasks.

Overall, this theme supports the idea that digital tools and AI can have a powerful effect on student motivation and engagement, encouraging greater interaction with the learning process and fostering an environment where students are more actively involved in their academic tasks.

The SRL program had a remarkable impact on students' motivation and engagement. As indicated in the quotes above, many students expressed a significant increase in their interest and engagement with lessons, particularly in subjects they previously found less engaging. For example, P3's quote indicates a change in attitude towards traditionally less favored subjects like biology and chemistry, with the help of digital tools and AI. Similarly, P6 reported experiencing less stress and adopting a more positive attitude toward their studies, attributing this change to better planning, which was facilitated by the SRL program.

P2's and P5's responses highlight the relationship between improved organization and more engaging learning experiences. By changing their study systems, they were able to use their time more effectively and find the learning process more rewarding. This demonstrates how structured learning, supported by AI and digital tools, can increase motivation by making the learning experience more interactive and personalized.

Furthermore, P7's feedback emphasizes the motivational boost that comes from academic success. The connection between improved performance in exams and enhanced motivation is well-documented in educational psychology, where positive reinforcement and goal achievement significantly increase student engagement (Zimmerman, 2002).

The findings from this theme align with research by Ng, Tan, & Leung (2024), who demonstrated that digital and AI tools can enhance student engagement by making learning more personalized and interactive. This approach fosters a deeper connection to the material, which leads to better learning outcomes. The integration of AI also helps students feel more in control of their learning process, as they can receive real-time feedback and adjust their strategies accordingly, enhancing both their motivation and engagement.

The SRL program effectively increased students' motivation and engagement with their academic tasks. The use of digital tools and AI not only made learning more interesting and accessible but also improved students' emotional engagement, reducing stress and increasing their satisfaction with their learning experiences. The findings suggest that the program has the potential to create more engaging and

motivational learning environments, which could be highly beneficial for future educational practices. Future studies could explore how sustained use of these tools affects motivation and engagement over time, particularly in challenging or self-paced learning environments.

4.2.3. Theme 3: Enhanced Self-Regulation and Learning Habits

Another theme that emerged was the improvement in students' self-regulation abilities, particularly in goal-setting, time management, and note-taking. Many students mentioned that the program taught them how to set goals and manage their study habits more effectively.

P1: *“Before, I only studied from the notes in my notebook. After digital tools and AI entered my life, I started learning more comprehensive information in a shorter time.”*

P1's quote demonstrates the profound impact of the SRL program on their learning habits. Previously, P1 relied solely on traditional methods like notebooks, which can limit the scope and efficiency of learning. After incorporating AI and digital tools, P1 was able to expand their learning strategies and access information more effectively. This aligns with the SRL models that suggest the use of diverse tools and techniques to enhance self-regulation (Zimmerman, 2002).

P2: *“My note-taking habits improved. I started taking notes during lessons and began reviewing those notes at home.”*

P2 highlights a key development in their learning habits—note-taking. The SRL program emphasized the importance of active engagement with the material, including taking notes. This shift allowed P2 to organize their thoughts better and review the material more effectively. It reflects the SRL concept of self-monitoring and organizing learning, which are critical components for academic success (Panadero, 2017).

P3: *“I never used to plan, but now I follow my lessons more systematically.”*

P3's statement reveals a significant shift in their approach to learning. Previously, they did not plan their study sessions, but after engaging with the SRL program, they started following a more organized and structured learning approach. This transformation reflects the core principle of self-regulation in SRL theory, where learners take responsibility for planning, monitoring, and adjusting their learning strategies (Zimmerman, 2002).

P4: *"I learned how to manage my time better and by setting better priorities, I was able to use my time more efficiently."*

P4's comment connects self-regulation with time management, a crucial skill emphasized by the SRL program. Learning to set priorities and organize tasks more efficiently helped P4 not only manage time but also use it effectively to improve academic performance. This highlights the importance of goal-setting and time management in SRL, which contributes significantly to student success (Zimmerman, 2002).

As reflected in the above quotes, the SRL program significantly enhanced students' self-regulation abilities, especially in the areas of goal-setting, time management, and note-taking. The students reported a clear improvement in their ability to set and achieve specific academic goals. They also mentioned adopting more structured learning habits, such as taking notes during lessons and reviewing them afterward, which helped reinforce their understanding of the material.

This finding aligns with the theoretical foundations of SRL, which emphasize the importance of goal-setting, self-monitoring, and reflection as key components of self-regulation (Zimmerman, 2002). The SRL program not only helped students organize their study time more effectively but also empowered them to monitor and evaluate their learning progress. By providing students with the tools and strategies to regulate their learning, the program enabled them to develop more effective and sustainable study habits.

Moreover, the students' ability to manage their time and set priorities was significantly enhanced. This ability is a core aspect of SRL, as students need to be able to plan,

manage, and adjust their study routines to ensure academic success (Panadero, 2017). The SRL program's integration of digital tools, such as note-taking applications and AI-powered study aids, likely played a significant role in these improvements by offering personalized feedback and adaptive learning paths.

The SRL program contributed to improving students' self-regulation skills, particularly in terms of setting and achieving goals, managing time, and organizing learning materials. This was a key factor in enhancing their academic performance and establishing effective learning habits. Future studies could investigate the long-term impact of these enhanced self-regulation skills on students' academic trajectories, particularly in self-paced learning environments.

4.2.4. Theme 4: User-Friendliness of Digital Tools

One of the key elements that students highlighted in the SRL program was the user-friendliness of the digital tools used. These tools were easy to navigate and use, which greatly encouraged students to engage with the materials and integrate the tools into their learning process. The simplicity and accessibility of the tools ensured that students did not face technical barriers, allowing them to focus more on their learning tasks.

P1: "I really like Canva. It helps me a lot when working on projects. I used to use tools like Microsoft, but I was wasting a lot of time."

P1 shared that using Canva made project work much easier and faster, particularly in comparison to older tools like Microsoft Office. P1 highlighted how much time they used to waste with more complex tools, emphasizing that the simplicity of Canva allowed them to work more efficiently. This shows that P1 valued the speed and accessibility Canva provided, and that a more user-friendly tool led to increased productivity.

On the other hand, P2, P4, and P5 all echoed similar sentiments, appreciating how easy it was to use the digital tools across multiple devices.

P2: *“Yes, it was user-friendly. I can easily access it, make presentations, and take notes.”*

P4: *“Yes, it was user-friendly. I can use it easily. I can access it comfortably from devices like a computer or a phone.”*

P5: *“It was very user-friendly. I can access it both from my phone and computer. I can work quickly and efficiently.”*

For instance, P2 appreciated the ease of use for accessing, presenting, and taking notes, while P4 and P5 highlighted the flexibility of using these tools on different devices like phones and computers. This demonstrates that the ability to use the tools across devices contributed to the program's success, as students were able to work from anywhere, improving their learning efficiency. The fact that students such as P4 and P5 did not face difficulties in accessing the tools suggests that user-friendly design contributed to a seamless and stress-free experience, which is crucial in maintaining student engagement.

P7: *“Yes, Canva especially is very easy. Everything is fast and simple to use.”*

Similarly, P7 found that Canva was particularly user-friendly, pointing out its speed and simplicity. P7's statement aligns with the feedback of the other participants, reinforcing the idea that ease of use made learning less burdensome and more efficient. By comparing these statements, it becomes clear that the commonality of experience with user-friendly tools helped all the participants stay focused on their learning rather than technology-related frustrations.

These findings align with previous research that emphasizes the importance of user-friendly platforms in encouraging engagement and reducing barriers to effective learning (Krauel-Nix et al., 2019). The ease of use allowed students to engage more actively, and their positive feedback indicates that user-friendly tools were a key motivator for their participation and academic progress.

The user-friendliness of the digital tools used in the SRL program was central to its success. Students' positive experiences with these tools suggest that easy-to-use platforms are essential for fostering engagement and motivation. The integration of accessible tools like Canva allowed students to focus on their studies rather than technical barriers, contributing to improved learning outcomes. This finding is consistent with research that emphasizes the role of user-friendly platforms in enhancing engagement and motivation (Krauel-Nix et al., 2019). Future SRL programs should prioritize the simplicity and accessibility of digital tools to enhance the learning experience and maximize student engagement.

4.3. RQ3: School Counseling Staff's Views & Experiences

This section discusses the perspectives and experiences of the school counseling staff regarding the implementation of the Self-Regulated Learning (SRL) program. It will explore how the counselors perceive the impact of SRL on students' academic success, personal growth, time management, and emotional regulation. The section will also address the role of digital tools, particularly AI-driven technologies, in facilitating the SRL process, as well as the opportunities and challenges that arise from their integration.

4.3.1. Theme 1: Holistic Impact of SRL on Students' Lives

The holistic impact of Self-Regulated Learning (SRL) refers to the broad influence SRL skills have on students beyond their academic achievements. It includes improvements in personal decision-making, time management, emotional regulation, and social interactions. By fostering self-awareness and self-control, SRL enables students to manage not only their learning process but also other life responsibilities, thus promoting balanced personal and academic growth. This theme reflects how SRL skills prepare students for lifelong learning by supporting their ability to make informed decisions, manage their time effectively, and engage with others in a more thoughtful and controlled manner.

Both counselors emphasized that self-regulated learning (SRL) not only supports academic achievement but also positively influences students' personal growth,

decision-making skills, time management, and social relationships. They believe that SRL is a life skill that extends beyond school boundaries.

C1: *“Self-regulation skills are not only limited to school life or academic processes. They help students manage their lives better and make healthier decisions.”*

Here, C1 emphasizes that SRL skills go beyond academics and empower students to take control of broader aspects of life.

C1: *“It helps with time management, planning tasks, and even being able to say ‘no’. When properly learned and applied, these skills enhance both academic success and personal development.”*

This statement highlights how mastering SRL supports emotional and behavioral regulation.

C2: *“Students have started to take more responsibility for their own learning processes. This reflects directly in their academic success.”*

C2 reinforces the role of SRL in encouraging student accountability and ownership in learning.

The counselors view SRL as a transformative approach that nurtures student autonomy, maturity, and responsibility—not just in academic settings but also in personal decision-making and social behavior. This aligns with Panadero (2017), who emphasized SRL’s role in developing lifelong learners capable of adapting across various domains.

C1’s statement that *“Self-regulation skills are not only limited to school life or academic processes. They help students manage their lives better and make healthier decisions,”* highlights the multifaceted nature of SRL. This reflection shows that SRL prepares students for life beyond the classroom. It empowers them to manage multiple responsibilities, such as balancing schoolwork with family or extracurricular activities, and helps them navigate their social environments with more maturity and self-

awareness. As students take responsibility for their own learning processes, they are also developing the ability to make informed decisions in other areas of their lives, thus strengthening their capacity for personal growth and decision-making.

C1's further observation that SRL "*helps with time management, planning tasks, and even being able to say 'no',*" suggests that the core benefits of SRL extend to emotional and behavioral regulation. SRL enables students to plan and prioritize tasks effectively, promoting responsible use of time. Additionally, it teaches them when to assert boundaries, which is an important skill not only in academic settings but also in personal relationships. The ability to say 'no' at appropriate times contributes to improved self-control, reducing impulsive behaviors and fostering emotional resilience.

Similarly, C2's remark that "*Students have started to take more responsibility for their own learning processes. This reflects directly in their academic success,*" underscores the link between SRL and the growth of student accountability. As students develop the ability to regulate their own learning, they also begin to take greater ownership of their academic achievements. This increased responsibility is not only a reflection of their academic maturity but also a sign of personal growth, where they start to apply self-regulation strategies to other life areas, resulting in enhanced overall development.

Both counselors' views strongly align with the literature on SRL, which emphasizes that SRL is a life skill that transcends academic contexts. Panadero (2017) emphasized that SRL is fundamental in shaping lifelong learners capable of adapting to diverse environments. The transformative power of SRL goes beyond simple academic achievement, promoting independence, critical thinking, and responsible decision-making that are crucial for success in various life domains.

In summary, SRL's holistic impact is profound, shaping not only students' academic outcomes but also their personal development, time management skills, and social behaviors. As students learn to regulate their learning, they also gain essential life skills, including emotional regulation, effective decision-making, and a heightened sense of responsibility. This broader impact of SRL fosters well-rounded individuals who are better equipped to manage their lives in both academic and personal contexts.

Therefore, SRL programs contribute significantly to the creation of responsible, self-aware, and adaptive individuals who will continue to benefit from these skills throughout their lives.

4.3.2. Theme 2: Academic Behavior and Skill Development

The SRL program led to noticeable improvements in students' study habits, including better planning, time management, note-taking, and early exam preparation. These behavioral changes made students more organized and purposeful in their academic tasks. By learning to manage their study time effectively, students were able to take more control of their learning, leading to better academic performance and reduced last-minute cramming.

C1: *“They used to start preparing for exams only during the exam week. Now, they’ve learned how to prepare in advance and determine which parts of the lesson to take notes on.”*

This quote highlights how the SRL program introduced a shift in students' behavior, particularly in the area of exam preparation. Previously, students often waited until the last minute to begin studying, but through the program, they learned how to plan and begin preparing much earlier, which is a key aspect of self-regulation. It shows that the program's influence extends beyond academic performance—it helps students take charge of their learning journey by setting goals and organizing their efforts.

C1: *“They became more organized in classes and more focused in their study sessions. I noticed their self-discipline improving.”*

Here, C1 emphasizes the development of organizational skills and focus in students. The mention of "self-discipline" suggests that SRL not only improved students' academic behaviors but also helped them cultivate habits that can extend into other areas of life. This reflects how SRL encourages students to actively monitor their progress and apply strategies that lead to more efficient learning, aligning with SRL's goal of enhancing autonomous learning.

C2: *“They started finishing assignments and preparing for exams earlier.”*

C2 highlights how SRL promoted a shift in students' approach to assignments and exam preparation. Students no longer procrastinated, and instead, began to tackle tasks earlier, demonstrating a proactive academic behavior. This comment illustrates that the SRL program's impact was not only on academic outcomes but also on how students structured their time and approached their responsibilities.

The SRL program's structured approach to learning fostered significant academic improvements in students. As reflected in the counselors' statements, students began to plan their study time more effectively, taking notes more purposefully and preparing for exams earlier. These changes demonstrate the practical application of SRL theory in real-life school contexts, where students not only engage in learning but also actively manage their academic behaviors. The improvements in planning, note-taking, and early preparation align closely with Zimmerman's (2002) SRL model, particularly in its emphasis on forethought (goal setting), performance (self-monitoring), and reflection (self-evaluation). These elements of SRL contribute directly to improved academic performance, as students become more organized, disciplined, and proactive in managing their tasks. Furthermore, the behavioral changes observed, such as increased self-discipline and earlier preparation, suggest that SRL equips students with lasting skills that extend beyond the academic setting, helping them approach challenges with greater responsibility and foresight.

4.3.3. Theme 3: Motivation and Self-Awareness

The SRL program significantly enhanced students' intrinsic motivation and helped them develop a greater awareness of their strengths, weaknesses, and learning behaviors. This improved self-awareness not only led to more responsible academic behavior but also fostered a deeper connection to their learning processes. By becoming more reflective, students took greater ownership of their academic journey and demonstrated more personal responsibility for their success.

C1: *“When students gain SRL skills, they also become more aware of how to use their free time, and they understand themselves better.”*

Here, C1 highlights how SRL not only improves academic performance but also facilitates self-reflection. This shift towards increased self-awareness means that students can now better manage their time, identifying productive and unproductive activities. This self-understanding extends beyond academic contexts, helping students make more informed decisions about how to use their free time effectively, which is a core element of SRL.

C2: “Students developed internal motivation. They began to attribute their academic success to their own efforts.”

C2 points to the key shift from external to internal motivation. In SRL, one of the primary goals is to help students realize that their academic success is the result of their own efforts, not external factors such as teachers’ praise or grades. By becoming more self-regulated, students develop intrinsic motivation, where their drive to succeed is self-sustained, leading to better long-term engagement and perseverance in their studies. This reflects Zimmerman’s (2002) notion of self-regulation, where learners are motivated by their own goals and progress, rather than relying on external validation.

C2: “Their self-awareness increased; they now know what they need to do and when.”

This quote illustrates how the SRL program enhanced metacognitive awareness in students. As students become more self-aware, they develop the ability to plan, monitor, and evaluate their learning strategies more effectively. They know what strategies work for them, how much time they need to allocate to each task, and how to adjust their approach if something is not working. This heightened awareness is a crucial component of SRL, as it enables students to take charge of their learning process, making more informed and deliberate decisions.

The counselors observed that as students developed SRL skills, they not only improved their academic habits but also experienced a boost in intrinsic motivation and self-awareness. This aligns with SRL theory, which suggests that metacognitive skills—such as self-reflection and self-regulation—are fundamental to fostering intrinsic motivation and sustained learning behaviors (Zimmerman, 2002; Panadero, 2017). As

students became more self-aware, they understood their learning behaviors better, which allowed them to make adjustments and take greater responsibility for their success. This shift in motivation from external sources (like grades or teacher approval) to internal sources (such as personal goals and self-satisfaction) reflects the essence of SRL, where learners become more autonomous and intrinsically motivated.

Furthermore, by developing a clearer understanding of their learning needs, students were better equipped to manage their time, set realistic goals, and approach academic challenges more effectively. This demonstrates the lasting impact SRL can have on students' academic and personal growth, as it empowers them to take control of their learning journey and fosters a deeper connection to their educational experience.

4.3.4. Theme 4: Implementation Challenges and Sustainability

While both counselors support the SRL program's sustainability and expansion, they also highlighted several challenges that could hinder its effectiveness and long-term integration. These challenges include student resistance, the need for increased teacher involvement, and ensuring that both teachers and students have the necessary digital literacy to make full use of the program. Addressing these barriers is critical for the continued success and expansion of the SRL program in schools.

C1: "Sometimes we encounter resistance from students, especially when they don't know what to do."

C1 points out a significant challenge—student resistance, particularly when students are unfamiliar with self-regulated learning approaches. This highlights the importance of introducing SRL gradually and providing students with clear guidance. If students don't understand how to engage with the program or perceive it as a disruption to their established learning habits, they may resist participating fully. This resistance can be mitigated through more comprehensive orientation and support during the initial phases of the program.

C2: "The sustainability of such programs depends on increasing teachers' digital literacy and providing equal access to technology."

C2 emphasizes two critical components for the SRL program's sustainability: the digital literacy of teachers and ensuring equitable access to technology for all students. Without adequate training and resources, teachers may struggle to effectively integrate SRL tools into their lessons, and students who lack access to the necessary technology may be left behind. This point aligns with broader educational research that stresses the importance of infrastructure and accessibility in the successful implementation of technology-driven educational initiatives (Ng, Tan, & Leung, 2024).

C1: *“The school supports this kind of program, but to make it sustainable, counselors and teachers must be enthusiastic and committed.”*

C1 brings attention to the human element—teachers’ and counselors’ commitment and enthusiasm. Without the active involvement and motivation of educators, no educational program, including SRL, can be effectively sustained. For the program to be successful in the long term, teachers and counselors must be fully invested in its goals and continuously adapt to the evolving needs of the students. This reinforces the idea that the sustainability of educational programs is not solely dependent on institutional support or infrastructure but also on the passion and engagement of those who deliver the program.

Although both counselors affirmed the potential of SRL programs to enhance student learning, they also highlighted critical challenges to ensuring the program's sustainability and scalability. These challenges included student resistance, a lack of digital literacy among both teachers and students, and the necessity for consistent support from teachers and counselors. The counselors' reflections are consistent with findings from Ng et al. (2024), which emphasize the importance of infrastructure, digital training, and gradual integration for the successful adoption of technology-enhanced learning models. Furthermore, their insights suggest that addressing these barriers early on—through comprehensive teacher training, clearer student guidance, and equitable access to technology—will be crucial for the program's continued success.

Teachers’ and counselors’ enthusiasm and commitment, as pointed out by C1, are also vital to sustaining the program. When educators are fully engaged, they are more likely

to inspire students and adapt the program to meet their evolving needs, ensuring that the program remains effective and relevant in the long term. Therefore, the SRL program's sustainability depends not only on technological infrastructure but also on the human elements of motivation, support, and engagement.

4.4. RQ4: School Administration Views & Experience

This section discusses the perspectives and experiences of the school management regarding the implementation and impact of the Self-Regulated Learning (SRL) program within the school. It explores the alignment of the SRL program with the existing educational practices, the role of digital tools and AI in enhancing students' learning processes, and the challenges faced in its adoption and sustainability. The feedback from the school administrators highlights both the strengths and limitations of the SRL program, offering insights into how it integrates with the broader school culture and contributes to students' academic and personal development. The findings aim to provide a deeper understanding of the administrative challenges and opportunities that come with implementing such educational innovations.

4.4.1. Theme 1: Integration of Technological Innovations into School Culture

School administrators frequently discussed the integration of technological tools and digital learning applications into the school culture. They emphasized how these tools not only improved students' learning processes but also contributed to developing independence and responsibility, while influencing the broader school environment.

A1: "It is crucial to use digital materials according to students' needs. Young people can access these tools whenever they want, and this significantly contributes to their educational process."

This quote emphasizes the flexibility and accessibility of digital tools, allowing students to engage with learning materials at their own pace. It shows that technology caters to the individualized learning needs of students, fostering autonomy.

A2: *“The program positively affected the school culture. Students started growing as more independent and responsible individuals.”*

This reflects the broader impact of digital tools, beyond just academics. It highlights the shift in students' personal development, suggesting that technology encourages responsibility and self-reliance, which are key components of a positive school culture.

A1: *“In addition to individual work, students supporting each other through teamwork is important. These types of applications greatly contribute to establishing the school culture.”*

This quote reveals how technology facilitates not only individual learning but also collaborative efforts among students. The use of digital tools encourages students to interact, share ideas, and work together, thereby enhancing the school community.

A2: *“These kinds of programs created more interaction and collaboration in the school, contributing to students' academic and social development.”*

This reinforces the idea of technology as a catalyst for increasing social and academic interaction among students. It emphasizes how digital programs help build a sense of community and teamwork, further enriching the school's social fabric.

Both A1 and A2 highlight the positive influence of digital tools on school culture, though from different perspectives. A1 focuses on the educational advantages, emphasizing that digital materials allow students to learn at their own pace, offering immediate and personalized access to resources. This accessibility enhances students' independence in managing their learning. Meanwhile, A2 reflects on the longer-term impact on students' personal development, noting how the program helps cultivate responsibility and independence, key elements of a positive school culture.

The contrast between these two quotes illustrates how technology not only facilitates independent learning (as shown in A1) but also plays a role in shaping the overall ethos of the school, fostering a culture of collaboration and responsibility (as shown in A2). A1 highlights the flexibility of digital tools in supporting individual needs, while A2

emphasizes their role in promoting a shift toward greater personal responsibility and interaction among students.

Furthermore, the quotes from A1 and A2 together suggest that technology is not just an academic tool but a transformative element within the broader educational culture. It shapes students' behaviors, interactions, and sense of responsibility, creating a more collaborative and dynamic environment. Thus, digital tools serve as powerful enablers not just of academic success but of cultural change within schools, improving both learning outcomes and the overall school climate.

4.4.2. Theme 2: Teachers' Adaptation to Digital Applications

A significant theme that emerged from the discussions was the challenge of teachers adapting to new digital tools. The success of these technological initiatives depends heavily on the teachers' willingness and ability to integrate these tools into their teaching practices.

A1: *“Since it was a new application, the biggest challenge was not being able to adapt mentally. Getting used to such a paradigm shift took time.”*

This quote points to the psychological and mental challenges teachers face when introduced to new tools. It underlines that adapting to a significant change in teaching methods is not immediate and requires time to accept the shift.

A2: *“At first, teachers had some hesitations about using digital tools. Teacher training is necessary for the effective use of these tools.”*

This emphasizes the hesitation teachers may feel when faced with new technology. It highlights that teacher training is a key element in overcoming these hesitations and ensuring that the tools are used effectively.

A2: *“Despite these challenges, teachers guided students, and eventually, students began using digital tools more effectively.”*

This quote shows how, despite initial hesitations and difficulties, teachers were able to help students adapt and use digital tools more effectively over time. It demonstrates resilience and the eventual success of teacher-student collaboration in mastering the new tools.

A1: *“Teachers must first accept and adopt these applications. Without teacher acceptance, it will be difficult to convey this to students.”*

This reinforces the idea that teacher acceptance is crucial. Without the teachers' own buy-in, it would be difficult to convince students to embrace these tools effectively. It suggests that teachers' initial resistance could directly affect the success of digital initiatives in the classroom.

The quotes from A1 and A2 provide insight into the multifaceted challenges of adapting to digital tools. A1 focuses on the personal, psychological aspect of the adaptation process. Teachers may experience a mental barrier to accepting new tools, especially when it involves a paradigm shift in how they approach teaching. This reflects the internal struggle of adjusting to change, which takes time and personal acceptance.

In contrast, A2 brings in the broader perspective, emphasizing the role of training and institutional support. While teachers may initially hesitate, adequate training can alleviate these concerns, enabling teachers to guide their students through the adaptation process. The success of this shift relies on a combination of individual willingness and external support systems, like professional development programs.

The comparison between these quotes highlights the dual nature of the adaptation process. A1 emphasizes the personal commitment required from teachers to embrace new technology, while A2 underscores the importance of structured support and training to ease the transition. Both aspects are essential for the successful integration of digital tools into the classroom. Teachers must not only be willing to change but must also receive the necessary training and ongoing support to be effective in this new environment.

Therefore, the integration of digital tools in education is not simply about introducing new technology; it requires a concerted effort to support teachers through both mental acceptance and professional development. This suggests that institutional support and continuous training are critical for ensuring that teachers are equipped to navigate this paradigm shift and successfully implement these tools in their teaching practices.

4.4.3. Theme 3: Student Performance and Independence

Definition: This theme focuses on how digital tools, supported by the self-regulated learning (SRL) program, influenced students' ability to manage their learning processes and how this improved their academic performance.

A2: *“Students began working more methodically, becoming more focused during lessons.”*

This quote highlights a significant shift in students' approach to learning. The SRL program helped them become more methodical, improving their concentration and focus during lessons, which suggests a positive impact on their overall academic engagement.

A1: *“Students learned to take notes and listen attentively during lessons. Teachers teach students what points are important and how to answer questions, which makes the learning process much more effective.”*

This emphasizes the specific skills that students developed, such as effective note-taking and active listening. It suggests that the SRL program not only helped students manage their time but also enhanced their academic strategies, making them more prepared to engage with the material and perform better.

A2: *“Students who gained self-regulated learning skills also participated more in extracurricular activities and projects.”*

This quote underscores that the SRL program had a broader impact beyond the classroom, encouraging students to engage more in extracurricular activities. This

suggests that as students became more disciplined in their learning, they also became more proactive in other areas of school life.

A2: “In terms of discipline, students started managing their time better, which increased their participation in lessons and enhanced their sense of responsibility.”

This statement focuses on the improvements in students' discipline and time management. By managing their time better, students became more engaged in their lessons and developed a stronger sense of responsibility, which further contributed to their academic success.

The quotes from A2 and A1 provide a detailed picture of how the SRL program influenced students' performance and independence. A2 emphasizes the impact of the SRL program on students' focus, time management, and participation. It shows how the program helped students become more organized and disciplined, which led to increased engagement in both academic lessons and extracurricular activities. These changes are indicative of a broader transformation in students' approach to their education, with a clear improvement in self-regulation.

In contrast, A1 adds another layer by highlighting the development of specific academic skills, such as note-taking and listening attentively. These skills not only improved students' ability to focus but also made them more effective learners. The focus on these learning strategies suggests that the SRL program doesn't just foster discipline but also encourages students to develop the cognitive skills needed to succeed academically. This is a crucial point, as effective learning strategies are just as important as time management when it comes to improving academic performance.

The combination of these quotes suggests that the SRL program takes a holistic approach to student development, addressing both behavioral changes and cognitive growth. A2 focuses on the behavioral aspect, highlighting improved discipline and engagement, while A1 focuses on cognitive skills, such as effective note-taking and critical listening. Together, these changes point to a more efficient, independent, and responsible student. By fostering both better time management and enhanced learning

strategies, the SRL program supports students in becoming more self-sufficient and successful in both their academic and extracurricular pursuits.

Ultimately, this holistic approach emphasizes the importance of not just developing students' ability to manage their time and discipline but also helping them acquire essential academic skills. This combination of behavioral and cognitive development ensures that students are better equipped to navigate their learning processes, leading to sustained academic success and increased personal responsibility.



CHAPTER V

DISCUSSION

This study aimed to develop and evaluate a digital and AI-supported Self-Regulated Learning (SRL) program, examining the views and experiences of students, school counseling services, and school administrators. The findings significantly align with the existing literature on the positive effects of SRL on academic achievement and personal development, as well as the role of digital tools and artificial intelligence in learning processes. In this section, the key findings of the study will be discussed in the light of current literature, addressing the effects of the program, challenges faced during implementation, and implications for future research.

5.1. Alignment with SRL Theory and Existing Research

The findings of this study reveal significant advancements in students' skills such as time management, goal-setting, and note-taking through the use of the digital and AI-supported Self-Regulated Learning (SRL) program. Students reported that digital tools enabled them to work more efficiently, avoid distractions, and structure their learning processes more systematically. For example, P1 emphasized the transformation in time management, stating, *"I used to feel like I had to study for two hours, but now I can use my time more efficiently."* Similarly, P3 shared that they didn't plan their study sessions before, but after the program, they began following their lessons in a more systematic manner. These observations align directly with the phases highlighted in Zimmerman's (2002) SRL cyclical model: forethought (goal-setting and planning), performance (monitoring progress and using strategies), and self-reflection (reviewing and adjusting plans). The results clearly demonstrate that students enhanced their abilities to actively plan, monitor, and evaluate their learning processes.

The digital tools used in the program, including platforms like Canva, Nearpod, and Padlet, played a key role in facilitating note-taking and lesson tracking, thus helping

students organize their learning. For instance, P2 highlighted their improved note-taking habits: *"My note-taking habits improved. I started taking notes during lessons and began reviewing them at home."* This improvement aligns with Calamlam's (2023) findings, which discuss the effectiveness of digital note-taking tools in supporting SRL. Furthermore, the ability of students to manage their learning process actively supports the cognitive and metacognitive learning theories that form the foundation of SRL, as outlined by Panadero (2017). The enhanced ability of students to devise and implement their own strategies indicates growth in SRL's cognitive and metacognitive components, such as summarizing, organizing, self-monitoring, and evaluating.

School counseling psychologists also emphasized that SRL skills extend beyond academic success to positively affect personal decision-making, time management, emotional regulation, and social relationships. C1 notably stated, *"Self-regulation skills are not only limited to school life or academic processes. They help students manage their lives better and make healthier decisions."* This highlights the broad impact of SRL on lifelong learning skills and personal development. This aligns with Panadero's (2017) assertion that SRL should help students become lifelong learners capable of adapting to various domains. A key finding in this context is the increase in students' responsibility for their learning and their intrinsic motivation. For example, P7's comment, *"I was successful in exams, which boosted my motivation,"* reinforces Zimmerman's (2002) claim about the critical role of motivation in enhancing performance and success. Furthermore, C2 noted that students began to link their academic success to their own efforts, reinforcing the role of SRL in cultivating intrinsic motivation and responsibility in the learning process.

The counselors also observed an increase in students' participation in extracurricular activities, which, as noted by A2, highlights SRL's contribution to broader personal development. By enhancing their time management skills (e.g., P7: *"I plan my time better and can do more things"*), students were able to engage more fully in activities beyond academics, ultimately becoming more balanced individuals. These findings strongly align with existing literature, demonstrating that SRL not only enhances students' academic performance but also supports their overall life skills and personal growth.

Overall, the study's results are consistent with SRL theory and existing research, which emphasize the multi-dimensional impact of SRL on both academic and personal development. This alignment underscores the importance of integrating SRL skills into educational practices to foster not only academic success but also the holistic development of students.

5.2. The Role of Digital Tools and Artificial Intelligence in Supporting SRL

The findings of this study strongly emphasize the transformative role that digital tools and Artificial Intelligence (AI) algorithms played in personalizing students' learning processes and improving their engagement with educational content. Specifically, the research utilized a variety of digital platforms, such as Canva for visual design, Nearpod and Webjets for interactive lessons, Miro for mind mapping, and Mentimeter and Padlet for real-time feedback and brainstorming activities. Furthermore, AI systems like ChatGPT were integrated into the program to provide adaptive learning pathways tailored to individual student needs and performance, offering students real-time feedback and dynamically adjusting content according to their progress.

Students consistently reported that these tools not only made academic tasks more efficient but also helped them develop more effective learning habits. For example, P1 pointed out how digital tools and AI enabled a more comprehensive and time-efficient learning experience: *"Before, I only studied from the notes in my notebook. After digital tools and AI entered my life, I started learning more comprehensive information in a shorter time."* This highlights how the use of digital tools facilitated deeper engagement and faster processing of information compared to traditional methods. P2 similarly emphasized the time-saving benefits of digital tools, noting, *"Digital tools really make our job easier. For example, I can type much faster on the computer when taking notes. This allows me to use my time more effectively."* This comment directly ties the use of technology to increased efficiency in note-taking. The improvement in how students approached their lessons is also evident, with P3 mentioning, *"I never used to plan, but now I follow my lessons more systematically."* These remarks collectively demonstrate how digital and AI-supported environments provided practical strategies and tools that empowered students to better manage their time, tasks, and overall learning processes.

A particularly significant aspect of the findings is the degree of personalization achieved through AI-supported systems, which provided real-time feedback and adjusted learning pathways to cater to individual student needs. This corroborates the research by Wong and Viberg (2024), who argue that AI-driven systems, such as adaptive chatbots and recommendation systems, offer personalized feedback that helps students adjust their learning processes. Khalil et al. (2024) further support this, emphasizing that digital technologies and AI are crucial in tailoring learning experiences and strengthening SRL through intelligent tutoring systems. Additionally, generative AI tools like ChatGPT were highlighted for their ability to assist students by offering automated feedback, summarizing key points, and breaking complex tasks into smaller, more manageable parts (Prasad & Sane, 2024). This personalized support was vital in helping students exercise better self-regulation over their learning.

Beyond efficiency, the integration of digital and AI tools also contributed significantly to enhancing student engagement and motivation. For example, P3 noted, *“Especially my interest in biology and chemistry increased. I didn’t have much enthusiasm for science subjects before, but thanks to digital tools and AI, my interest in these subjects grew.”* This observation was echoed by P5, who remarked, *“My interest in my lessons increased. Before, I would play games when I got bored, but now I prefer to watch lessons.”* These findings strongly align with the work of Ng, Tan, and Leung (2024), who assert that digital and AI tools improve student engagement by making learning more interactive and personalized. The adaptability of AI, which tailors learning suggestions to student progress, was also identified as a key factor in helping students stay on track and maintain motivation throughout their learning journey.

Another crucial factor that emerged from the findings was the user-friendliness of the digital tools, which facilitated their successful integration into students' learning processes. Students consistently appreciated the simplicity and accessibility of these tools, which minimized technical barriers and allowed them to focus on their learning rather than troubleshooting. P1 particularly favored Canva for project work, saying, *“I really like Canva. It helps me a lot when working on projects. I used to use tools like Microsoft, but I was wasting a lot of time.”* This demonstrates how the ease of use directly contributed to increased productivity. Multi-device accessibility further enhanced the convenience, as P2 remarked, *“Yes, it was user-friendly. I can easily*

access it, make presentations, and take notes,” while P4 added, *“Yes, it was user-friendly. I can use it easily. I can access it comfortably from devices like a computer or a phone.”* P5 echoed this, stating, *“It was very user-friendly. I can access it both from my phone and computer. I can work quickly and efficiently.”* Finally, P7 succinctly summarized, *“Yes, Canva especially is very easy. Everything is fast and simple to use.”* This aligns with the findings of Krauel-Nix et al. (2019), who argue that user-friendly platforms significantly increase student engagement and minimize the barriers to effective learning. The seamless experience provided by these tools ensured that students could fully leverage their potential for self-regulated learning, without being hindered by technological challenges.

In summary, the study highlights how digital tools and AI algorithms not only improved the efficiency of students’ learning but also played a vital role in personalizing their educational experiences, boosting their engagement, and fostering a deeper connection with their learning tasks. The ease of use, adaptability, and real-time feedback offered by these tools were integral in helping students develop essential SRL skills, confirming the substantial contribution of digital and AI technologies to enhancing self-regulation in learning. These findings are consistent with existing research and further illustrate the potential of these technologies to revolutionize the way students engage with learning, leading to more motivated, self-directed, and effective learners.

5.3. Challenges and Sustainability of the Implementation Process

The integration of digital tools and AI into Self-Regulated Learning (SRL) programs presents substantial challenges that must be addressed for effective implementation and long-term sustainability. The study revealed key obstacles including technological adaptation issues, disparities in digital literacy, and human factors such as resistance to change and the need for educator commitment.

One of the major challenges identified was the initial difficulty some students faced when adapting to the new technology. As reported by participants, this challenge was prevalent at the beginning of the implementation phase. For example, P1 explained, *“I had some trouble with the technology at first, but after a couple of sessions, I felt more*

comfortable." School administrators also observed these struggles, with A2 noting, *"The initial feedback showed that some students struggled with the technical aspects, but with support, they were able to adapt quickly."* This indicates that while initial difficulties are common, ongoing support and training are essential for ensuring all students can effectively use the technology. These findings align with prior research which highlights the importance of providing adequate technical support during the implementation phase of digital learning programs (Prasad & Sane, 2024).

Another critical issue identified was the variation in digital literacy levels and access to technology among students. These disparities posed significant barriers to the equitable effectiveness of the SRL program. As noted by C2, *"The sustainability of such programs depends on increasing teachers' digital literacy and providing equal access to technology."* This echoes previous studies that emphasize how differences in socio-economic background can affect access to technology, further exacerbating inequalities in learning opportunities (Prasad & Sane, 2024). This indicates the importance of ensuring that all students, regardless of their background, have equal access to the tools and training needed to maximize the benefits of AI-supported learning opportunities.

Additionally, some students struggled to effectively engage with AI in the learning process. The need for more training in digital literacy was evident, as highlighted by both counselors and administrators. The study confirms that the effectiveness of AI tools is closely linked to students' ability to interact with them, which further supports the need for targeted interventions in digital literacy to level the playing field for all learners.

Resistance to adopting new digital tools and teaching paradigms among educators was another significant challenge. School administrators and counselors noted that the adoption process was met with hesitation. A1 articulated this psychological barrier, stating, *"Since it was a new application, the biggest challenge was not being able to adapt mentally. Getting used to such a paradigm shift took time."* A2 added, *"At first, teachers had some hesitations about using digital tools,"* stressing that *"Teacher training is necessary for the effective use of these tools."* This resistance indicates that the success of digital tools in SRL programs depends not only on the students but also

on teachers' willingness and ability to integrate these technologies into their teaching. These findings align with Ng et al.'s (2024) study, which emphasizes the need for comprehensive teacher training, infrastructure development, and gradual integration of digital tools to ensure successful adoption.

The study also highlighted the importance of enthusiasm and commitment from both teachers and counselors for ensuring the program's sustainability. As C1 emphasized, *"The school supports this kind of program, but to make it sustainable, counselors and teachers must be enthusiastic and committed."* This statement illustrates that the long-term success of educational programs relies heavily on the passion and active engagement of educators. Without their support, it would be difficult to sustain or expand the program. Teachers' commitment to the program is vital to adapt the curriculum to meet the evolving needs of students and ensure that the learning objectives are continuously achieved.

In conclusion, while digital and AI tools provide immense potential to support SRL, their successful integration into educational programs requires overcoming technological barriers, addressing digital literacy disparities, managing educator resistance, and fostering strong support and enthusiasm from all stakeholders. The findings from this study underscore the importance of a well-rounded approach that includes technical support, educator training, and the active involvement of educators and counselors in order to ensure the program's long-term effectiveness and sustainability.

5.4. Effects from the Perspectives of School Administrators and Counseling Staff

School administrators and counseling staff emphasized the positive integration of the digital and AI-supported Self-Regulated Learning (SRL) program into the school culture, recognizing its substantial contribution to the overall development of students. The implementation of this program resulted in noticeable improvements in students' learning behaviors and academic processes.

One of the key observations from administrators was the flexibility that digital tools provided, allowing students to access them at any time. This flexibility greatly

enhanced their learning experiences, contributing significantly to their overall educational process. Administrator A2 stated that the program positively affected the school culture, as it fostered the development of students into more independent and responsible individuals. This observation aligns with the broader literature, which emphasizes that digital tools have the potential to create personalized learning environments, where technology supports individualized learning needs and encourages student autonomy.

Furthermore, the SRL program was found to encourage greater collaboration among students, enriching the school community. Administrator A1 stressed the importance of students supporting each other through teamwork, highlighting that such applications contributed positively to the school culture. Administrator A2 echoed this by noting that these types of programs fostered more interaction and collaboration within the school, thereby contributing to both academic and social development. This suggests that digital tools not only support individual learning but also play a significant role in shaping the overall ethos of the school, promoting a collaborative and dynamic learning environment.

The program's influence extended beyond academics to include substantial improvements in students' academic behaviors and personal discipline. Administrators observed that students became more methodical and focused during lessons, with better study habits and greater participation in extracurricular activities. Administrator A2 mentioned that students began working in a more organized manner, with a stronger focus during lessons. Administrator A1 added that students learned to take notes more effectively and pay attention to key points during lessons, which made the learning process more productive. Similarly, Counselor C1 noted that students, who previously only began preparing for exams close to the exam week, learned to plan their study time more effectively, identify key points for note-taking, and stay more organized. This demonstrated significant improvements in self-discipline.

Moreover, the SRL program helped students manage their time more effectively. Counselor C2 observed that students began completing assignments and preparing for exams earlier, reflecting better time management skills. This shift in behavior led to increased participation in lessons and a heightened sense of responsibility. Counselor

C1 emphasized that the benefits of self-regulation skills went beyond academic achievement. She noted that these skills helped students manage their personal lives better, make healthier decisions, and improve their overall time management, planning, and task management. These skills contributed to both academic success and personal growth, reinforcing the idea that SRL is not only a tool for academic achievement but also a critical life skill.

Another area where the program had a significant impact was students' involvement in extracurricular activities. Administrator A2 observed that students who gained self-regulated learning skills also participated more in extracurricular activities and projects. This suggests that the program encouraged students to be more proactive in other areas of school life, beyond just academic pursuits.

Counseling staff emphasized that self-regulation skills had a broader impact on students' lives, improving not just academic achievement but also their personal development, decision-making, time management, and social relationships. The program was seen as fostering intrinsic motivation in students, encouraging them to attribute their academic success to their own efforts. Counselor C2 reported a noticeable increase in students' self-awareness, stating that "they now know what they need to do and when." This aligns with the core principles of SRL theory, which focuses on the development of students' abilities to plan, monitor, and evaluate their learning processes through cognitive and behavioral changes.

In conclusion, both school administrators and counseling staff agreed that the digital and AI-supported SRL program not only enhanced students' academic performance but also significantly contributed to their personal development, sense of responsibility, and active participation in the school community.

5.5. Contribution to the Field and Implications for Future Research

This study significantly contributes to the growing body of literature on digital and AI-supported Self-Regulated Learning (SRL) programs by providing solid evidence of the positive effects of such programs on students' motivation, engagement, self-regulation skills, and academic habits. The study's findings strongly suggest that SRL programs,

when supported by digital tools and AI, enable students to manage their learning processes more consciously, boost their intrinsic motivation, and foster greater independence in their academic tasks. As previously emphasized by Panadero (2017), SRL equips students with essential lifelong learning skills, and the results of this study validate how technology-enhanced SRL can cater to the increasing demand for autonomous learners in modern education systems.

One of the most significant contributions of this study is the successful implementation of the ADDIE model in program development. The systematic approach offered by ADDIE (Analysis, Design, Development, Implementation, and Evaluation) ensured the creation of an effective, adaptable, and evidence-based program. This is aligned with the views of Administrator A2, who emphasized the importance of systematic integration, stating, *“The program positively affected the school culture, as students began to develop into more independent and responsible individuals.”* The success of the ADDIE framework in the context of SRL offers a robust method for integrating technology into education, making it more responsive to students' needs and more adaptable to their learning environments (Branch, 2009). This study's application of this model demonstrates the potential of SRL to enhance academic outcomes and provides insights into best practices for designing technology-enhanced educational programs.

Moreover, the findings demonstrate the powerful role of AI in personalizing the learning experience. AI systems, particularly those offering real-time feedback and adaptive learning paths, were central to the success of this SRL program. As P2 remarked, *“Digital tools really make our job easier. For example, I can type much faster on the computer when taking notes. This allows me to use my time more effectively.”* This statement highlights the efficiency that digital and AI tools bring to the learning process. The ability of AI to deliver instant, tailored feedback is consistent with research by Khalil et al. (2024) and Wong and Viberg (2024), who note that AI tools provide personalized learning experiences, significantly boosting student engagement and performance by adjusting the content based on individual progress. Students, such as P3, who initially showed little enthusiasm for certain subjects, reported a shift in their interest. P3 shared, *“Especially my interest in biology and chemistry increased. I didn't have much enthusiasm for science subjects before, but*

thanks to digital tools and AI, my interest in these subjects grew.” This demonstrates how AI tools can reignite student interest and engagement in subjects previously deemed less engaging, supporting Ng, Tan, and Leung’s (2024) assertion that technology enhances engagement by personalizing and making learning more interactive.

Despite these positive outcomes, the study recognizes several limitations. One key limitation is the sample size, as the study focused on 9th-grade students, counseling service staff, and school administrators from a single institution, which restricts the generalizability of the findings. As P2 stated, *“The program helped me a lot, but I wonder how students from different backgrounds might respond.”* This raises the point that future studies should include larger and more diverse student populations across different age ranges and socio-economic backgrounds to capture a broader perspective on SRL’s impact. Moreover, future research could examine the long-term effects of SRL programs on students’ learning trajectories to understand if the benefits observed in this study are sustained over time.

Another limitation addressed by participants was the initial resistance to adopting digital tools. As A1 explained, *“Since it was a new application, the biggest challenge was not being able to adapt mentally. Getting used to such a paradigm shift took time.”* Teachers’ hesitations about new technology mirrored the findings of Ng et al. (2024), who highlighted the importance of teacher training and gradual integration of digital tools. This study reinforces the need for comprehensive teacher training programs to support educators in integrating digital tools effectively into their teaching practices. P1 also reflected, *“At first, I didn’t know how to use the digital tools properly, but with the training and support, I managed to adapt quickly.”* This highlights the importance of ongoing professional development for teachers to overcome initial resistance and build confidence in using new educational technologies.

Moreover, the study suggests that over-reliance on AI tools could be a concern, especially for students who may become overly dependent on these systems. As P4 noted, *“I really like the AI tools, but sometimes I wonder if I can still manage on my own without them.”* This sentiment points to the need for research on how to balance

AI usage with self-reliance to avoid dependency. Further studies should explore strategies to prevent excessive reliance on AI while still benefiting from its advantages.

Additionally, the ethical concerns surrounding AI tools—such as algorithmic bias and data privacy—were not directly addressed in this study but are vital areas for further investigation. As P2 pointed out, *“We need to be careful about how AI collects and uses our data. It’s something we should think about.”* This highlights the importance of safeguarding student privacy and ensuring that AI tools are used ethically in educational contexts. Ethical considerations, as noted by Prasad and Sane (2024), must be prioritized in the design and implementation of AI-supported educational programs.

In conclusion, this study contributes significantly to the literature on the integration of technology in education, offering valuable insights into how digital and AI-supported SRL programs enhance students’ academic performance, self-regulation, and personal development. The findings support the effectiveness of the ADDIE model in program development and demonstrate the critical role of AI in personalizing learning experiences. However, future research should address the limitations of this study by expanding the sample size, investigating long-term effects, and focusing on teacher training, ethical considerations, and strategies for minimizing over-reliance on AI. The continued exploration of SRL in different educational contexts will further solidify its role as a transformative tool for personalized learning.

CHAPTER VI

CONCLUSION

This study aimed to develop and evaluate a digital and Artificial Intelligence (AI)-supported Self-Regulated Learning (SRL) program, investigating the perspectives and experiences of students, school counseling staff, and administrators. The findings affirm the significant potential of integrating digital tools and AI into educational practices, showcasing their ability to foster essential SRL skills and improve overall learning experiences.

The SRL program demonstrated a substantial positive impact on students' academic behaviors and personal development. Students reported significant improvements in critical self-regulation skills, including time management, goal-setting, note-taking, and overall study habits. Many students expressed that they could now manage their time more effectively, systematically approach lessons, and reduce distractions—shifts from their previous, more disorganized approaches. This shift in academic behavior aligns with Zimmerman's SRL cyclical model (2002), which emphasizes forethought, performance, and self-reflection as key stages in self-regulated learning. Furthermore, the program notably enhanced student engagement and intrinsic motivation, particularly in subjects previously considered challenging. As many students expressed, they felt more motivated and interested in their studies due to the interactive nature of the digital tools and AI support. Academic success, resulting from improved self-regulation, further reinforced these positive changes. Beyond academics, the program extended its impact to broader life skills, including decision-making, emotional regulation, and social interaction. Counselors and administrators highlighted the importance of SRL in promoting personal growth and adaptability—traits aligned with the broader aim of lifelong learning.

The integration of digital tools and AI into the SRL program played a transformative role in personalizing the learning process. Tools like Canva, Nearpod, Webjets, Miro,

Mentimeter, and Padlet facilitated interactive lessons, visual planning, real-time feedback, and efficient note-taking. The use of AI, particularly ChatGPT, provided adaptive learning paths tailored to individual student needs, significantly enhancing personalized learning experiences. The user-friendliness and multi-device accessibility of these digital tools also contributed to students' engagement and reduced technological barriers, ensuring that students could focus on learning rather than struggling with technical difficulties. These findings align with recent studies by Khalil et al. (2024) and Wong and Viberg (2024), who emphasize the role of AI in supporting SRL by offering personalized feedback and adaptive learning experiences.

While the findings of this study are promising, several challenges remain for the effective and sustainable implementation of digital and AI-supported SRL programs. Initial technological adaptation difficulties were experienced by some students, highlighting the need for continuous support and training. This was compounded by disparities in digital literacy and access to technology, which significantly affected equitable access to the program. The variation in students' technological abilities and the infrastructure of their schools presented barriers to universal program effectiveness. As noted by participants, initial resistance from teachers regarding the adoption of digital tools further complicated the program's implementation. This finding echoes the work of Ng et al. (2024), who emphasize the importance of ongoing teacher training and support in overcoming resistance to new teaching methods. Furthermore, concerns about over-reliance on AI tools were raised, suggesting that while AI can facilitate learning, it must be carefully balanced to avoid diminishing students' autonomy and critical thinking skills.

This study makes a significant contribution to the field of educational technology by providing empirical evidence of the positive effects of digital and AI-supported SRL programs. The ADDIE model's systematic approach to program development proved to be a reliable framework for integrating technology in education, offering a well-rounded structure for creating adaptable, evidence-based educational programs. The study's findings underscore the potential of such programs to foster self-regulation, enhance student engagement, and improve academic habits, thereby offering valuable insights for educators, policymakers, and technology developers seeking to leverage digital tools for personalized learning.

Future research should build upon these findings by expanding the sample size and examining the long-term effects of SRL programs. Including more diverse student populations across different socio-economic backgrounds, age ranges, and educational settings will help enhance the generalizability of the results. Longitudinal studies will be critical to understanding the lasting impact of SRL programs on students' academic trajectories and life skills. Further research should also explore strategies to reduce the over-reliance on AI while ensuring that students benefit from its capabilities. Ethical concerns related to AI, including data privacy and algorithmic bias, must be addressed to ensure that digital learning tools remain fair and inclusive. Finally, research focused on developing optimal teacher training programs and integration strategies for digital tools will be essential for supporting educators as they adapt to the evolving educational landscape.

In conclusion, digital and AI-supported SRL programs represent a promising and transformative approach to education, offering students a more personalized, efficient, and engaging learning experience. By addressing the challenges and capitalizing on the opportunities presented by technology, future SRL programs can further enhance students' learning outcomes, autonomy, and personal growth, reinforcing their role as key contributors to the future of education.

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APPENDICES

APPENDIX A

PARTICIPANT INFORMATION AND CONSENT FORM



İBN HALDUN
ÜNİVERSİTESİ

KATILIMCI BİLGİLENDİRME ve ONAM FORMU

Araştırma Başlığı:

Dijital ve Yapay Zekâ Destekli Öz-Düzenlemeli Öğrenme Programının Geliştirilmesi ve Değerlendirilmesi

Araştırmacı:

Zeyneb Gazel – İbn Haldun Üniversitesi, RPD Master Programı, Yüksek Lisans Tezi Sizi yukarıda belirtilen başlığa sahip bir araştırmaya katılmaya davet ediyoruz. Bu araştırmaya katılıp katılmama kararını vermeden önce, araştırmanın amacı, kapsamı ve nasıl yürütüleceği hakkında bilgi sahibi olmanız oldukça önemlidir. Bu nedenle lütfen aşağıda yer alan açıklamaları dikkatlice okuyunuz. Gerekirse bu bilgileri ailenizle veya yakın çevrenizle paylaşarak değerlendirme yapınız. Anlamadığınız veya açık olmayan konular hakkında bizimle iletişime geçebilirsiniz.

Araştırmanın Amacı:

Bu çalışma, dijital ve yapay zekâ destekli bir öz-düzenlemeli öğrenme (SRL) programının geliştirilmesi ve uygulanması sürecinde öğrenci, rehber öğretmen ve yöneticilerin deneyimlerini ve görüşlerini incelemeyi amaçlamaktadır. Araştırma kapsamında elde edilen veriler yalnızca bilimsel amaçlar doğrultusunda kullanılacak ve üçüncü kişilerle paylaşılmayacaktır.

Katılım Gönüllülüğü:

Bu çalışmaya katılım tamamen gönüllülük esasına dayanmaktadır. Katılımcılar istedikleri anda görüşmeden çekilebilir, yanıt vermek istemedikleri sorulara cevap vermeme hakkına sahiptir. Katılım ya da katılmama kararınız size karşı hiçbir hak kaybı veya yaptırıma neden olmayacaktır.

Görüşme Süreci:

Görüşmeler yaklaşık 30-45 dakika sürecektir. Görüşmeler ses kaydı ile kaydedilecek, daha sonra yazıya dökülerek analiz edilecektir. Görüşme kayıtları araştırma sonunda güvenli bir şekilde imha edilecektir.

Gizlilik ve Anonimlik:

Araştırma kapsamında elde edilen kişisel bilgiler gizli tutulacaktır. Katılımcı isimleri hiçbir yayında veya paylaşımında yer almayacak, tüm katılımcılar kodlanarak (örneğin, K1, Ö2) analiz edilecektir. Katılımcıların kimlik bilgileri yalnızca araştırmacı tarafından bilinecek ve korunacaktır.

Etik Kurul Onayı:

Bu araştırma, İbn Haldun Üniversitesi Etik Kurulu tarafından onaylanmıştır ve etik kurallara uygun şekilde yürütülmektedir.

KATILIMCI ONAM FORMU

Bu araştırmanın amacı, süreci ve haklarım konusunda yukarıda verilen açıklamaları okudum ve anladım. Araştırmaya gönüllü olarak katılmayı kabul ediyorum.

Adı Soyadı:

İmza:

Tarih:

GÖRÜŞME KAYIT İZİNİ FORMU

Araştırma kapsamında yapılacak görüşmenin ses kaydı alınmasına izin veriyorum. Görüşme kayıtlarının sadece bilimsel amaçlarla kullanılacağını ve kimliğimin gizli tutulacağını biliyorum ve kabul ediyorum.

Adı Soyadı:

İmza:

Tarih:

Sorumlu Araştırmacının Bilgileri:

Adı Soyadı:

Tarih:

İmza:

Akademik Danışman: Dr. Öğrt. Üyesi Mehmet Akın Bulut

APPENDIX B

PARENT INFORMATION AND CONSENT FORM



VELİ ONAM FORMU

Araştırma Başlığı: *Dijital ve Yapay Zekâ Destekli Öz-Düzenlemeli Öğrenme Programının Geliştirilmesi ve Değerlendirilmesi*

Araştırma Yapan: Zeyneb Gazel – İbn Haldun Üniversitesi, RPD Master's Program, Yüksek Lisans Tezi

Araştırmanın Amacı: Bu araştırma, dijital ve yapay zekâ destekli öz-düzenlemeli öğrenme (SRL) programının geliştirilmesi ve değerlendirilmesi üzerine yapılmaktadır. Araştırmanın amacı, öğrencilerin bu programdaki deneyimlerini ve öğrenme süreçlerine etkilerini incelemektir. Araştırma sadece akademik amaçlarla yapılacak olup, katılımcıların kimlikleri gizli tutulacaktır.

Katılımcıların Süreçteki Rolü: Araştırmaya katılacak olan öğrenciler, yarı yapılandırılmış görüşmelere katılacaklardır. Bu görüşmeler, öğrencilerin öğrenme süreçleri ve program hakkındaki deneyimlerini anlamayı amaçlamaktadır. Görüşmeler sırasında elde edilen veriler yalnızca araştırma için kullanılacak ve katılımcıların kimlikleri gizli tutulacaktır.

Katılımın Gönüllülük Esasına Dayalı Olması: Araştırmaya katılım tamamen gönüllülük esasına dayalıdır. Öğrencinizin bu araştırmaya katılıp katılmama kararı tamamen kendisine aittir. Katılım veya katılmama kararı, öğrencinin eğitimine veya başka herhangi bir sürece etkisi olmayacaktır. Katılımcılar istedikleri zaman görüşmeyi sonlandırabilirler.

Veri Güvenliği ve Gizlilik: Araştırmada toplanan tüm veriler güvenli bir şekilde saklanacak ve yalnızca araştırma amacıyla kullanılacaktır. Öğrencilerin kimlik bilgileri gizli tutulacak ve yalnızca araştırmacı tarafından erişilebilecektir. Görüşme kayıtları anonimleştirilecek ve katılımcılar yalnızca anonim olarak raporlarda yer alacaktır.

Verilerin İmhası: Araştırma tamamlandığında tüm veriler güvenli bir şekilde imha edilecektir. Hem dijital hem de fiziksel veriler geri dönüşümsüz olarak silinecek ve yok edilecektir.

Acil Durum ve Psikolojik Destek: Görüşmeler sırasında öğrencinizin herhangi bir rahatsızlık hissetmesi durumunda, görüşme sonlandırılacaktır. Ayrıca, öğrencilere gerektiğinde psikolojik destek sağlanacaktır.

Katılım Onayı: Bu araştırmaya katılım tamamen gönüllülük esasına dayalı olup, öğrencinizin hakları korunacaktır. Araştırma sürecine katılmak istemediğinizde herhangi bir olumsuz durumla karşılaşmazsınız.

Aşağıda yer alan kutuyu işaretleyerek, öğrencinizin bu araştırmaya katılımını onayladığınızı belirtmiş oluyorsunuz.

Katılım Durumu:

Katılımı Onaylıyorum

Katılımı Onaylamıyorum

Veli Adı Soyadı:

Veli İmzası:

Tarih:

Sorumlu Araştırmacı İletişim Bilgileri:

Adı Soyadı: Zeyneb Gazel

Telefon:

E-posta:

Akademik Danışman: Dr. Öğrt. Üyesi Mehmet Akın Bulut

APPENDIX C

ETHICS COMMITTEE PERMISSION

Evrak Tarih ve Sayısı: 30.06.2025-59595



T.C.
İBN HALDUN ÜNİVERSİTESİ
Sosyal ve Beşeri Bilimler Bilimsel Araştırma ve Yayın Etiği
Kurulu Başkanlığı



Sayı : E-71395021-050.04-59595
Konu : Etik Kurul Kararı - Zeyneb GAZEL

30.06.2025

İLGİLİ MAKAMA

Kurulumuza başvuran Zeyneb GAZEL'in, "Development and Evaluation of a Digital and AI-Supported Self-Regulated Learning Program" isimli projesi; amaç, araştırma türü, veri toplama araçları, süreç ve işlemler, veri analizleri dikkate alınmak suretiyle 23.06.2025 tarihinde değerlendirilerek 2025/07-09 karar numarası ile etik açıdan uygun bulunmaktadır.

Bilgilerini ve gereğini arz/rica ederim

Prof. Dr. Alev ERKİLET
Başkan

CURRICULUM VITAE

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2017 – 2023 BA in Psychological Counseling and Guidance, İbn Haldun
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Publications:

1. Bulut, M. A., Maraba, D., Kaya, N., Gazel, Z., Katırcı, E. K., & Altunel, E. T. (2024).A Technology-Enhanced Student Self-Efficacy Development Program. *BABUR Research*, 3(1), 253-263.