Promoting Self-Regulation Skills Among Pre-Service Islamic Studies Teachers Through Project-Based Learning Utilizing a Flipped Learning Strategy

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Abstract. This study examined the effectiveness of a flipped learning strategy (FLS) on self-regulated learning (SRL) skills among pre-service Islamic education teachers utilizing project-based learning (PBL). The study collected both quantitative and qualitative data from participants using a mixed-methods design. Questionnaires were used to collect quantitative data, while unstructured interviews and written reflections from participants were used to collect qualitative data. Most participants (79%) had a favorable opinion of the FLS project, and their experience designing and executing the project using the PBL strategy had a positive impact on their SRL skills. The participants reported that the project strengthened their resolve to adopt FLS as an instructional strategy. The study emphasizes the need for rigorous preparation programmes and early exposure to innovative practices to boost teachers' sense of self-efficacy and SRL skills. The study also highlights the potential advantages of aligning educational programmes with refined-oriented practices to positively influence educators' perspectives and pedagogical strategies in the classroom. Despite the positive findings of the study, Islamic Studies instructors' capacity for self-regulation requires further investigation. Specifically, further research is required to investigate the impact of FLS on teachers' SRL skills in different subject areas and the long-term effects of FLS on teacher development and student outcomes.

Keywords: flipped learning strategy; Islamic Studies; pre-service teacher; project-based learning; self-regulation learning skills

1. Introduction

One of the essential factors for students to obtain self-regulated learning skills is to allow them to take responsibility for their own learning, leading to academic achievement and lifelong learning. There is broad consensus regarding the need for students to develop self-regulated learning skills, which can be facilitated by

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providing them with tools and creating an authentic learning environment that promotes meaningful learning, knowledge development, and higher levels of academic achievement (Alkandari, 2015; English & Kitsantas, 2013). Teachers are required to seek innovative, active learning strategies to promote students' self-directed learning and self-regulation learning (SRL*) skills by introducing them to teaching approaches that activate their learning outcomes, such as problem-solving and critical thinking (Alabdulhadi, 2019; Bishop & Verleger, 2013; Göl, 2012).

Studies have shown that integrating project-based learning (PBL) strategies within teaching practices helps students actively engage in their learning experiences and, in essence, learn how to learn. Through active engagement with projects, students build habits in knowledge construction, planning, critical thinking, and problem-solving, as well as enhance SRL skills (English & Kitsantas, 2013).

Project-based learning pedagogy is an effective method of promoting SRL skills. Students who apply PBL pedagogy in a constructivist complex-learning context develop autonomy and self-control. Teachers play a vital role in structuring activities that motivate students and facilitate learning by using teaching methods like scaffolding and reflections, providing timely guidance, and aligning their thought processes with PBL strategies (English, 2013). Several academics have lauded PBL as a method for teacher preparation that emphasizes hands-on classroom experience and efficient information delivery to students (Almulla, 2020). According to Tsybulsky and Muchnik-Rozanov (2019), the PBL approach provides inexperienced teachers with valuable learning experiences that foster both professional and personal development. In addition, the PBL model can facilitate the development of higher-order thinking skills, which form an essential part of 21st-century competencies. These competencies include innovative technological communication skills, which gain significance in the teaching-learning process. Encouraging teachers to implement PBL in their classrooms can be an effective way to integrate technology into the learning process, thereby enhancing the skills of both teachers and students (Saimon et al., 2022). It has been observed that participation in such projects promotes decision-making skills, improves collaboration skills, and encourages creativity among students (Howard, 2002). Thus, self-regulated skills could be fostered by accepting challenges using PBL strategies, which are further enhanced because students enjoy PBL (Beckett & Slater, 2018).

Research has revealed that applying PBL pedagogy by utilizing online projects that activate technology incorporation allows positive student participation (Meng et al., 2023; Boyas, 2008). Preparing prospective teachers to foster information and communication technology usage within their teaching strategies through innovative PBL pedagogies does not merely improve technology literacy, but more importantly, helps their students acquire analytical and critical higher thinking skills and foster their sense of self-efficacy, autonomous learning, and SRL skills. Studies have confirmed that employing PBL

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*SRL, self-regulation learning; PBL, project-based learning; FLS, flipped learning strategy

pedagogy through online projects, working with technology, and utilizing various online tools allowed students maximum autonomy compared to other traditional models of learning strategies (Çakiroğlu & Erdemir, 2019; Sutia et al., 2019). Teachers' willingness to cultivate self-learning skills among their students through the inventive use of technology has increased significantly (Alabdulhadi, 2019; Robert, 2014).

Studying how PBL and a flipped-learning strategy (FLS) affect the SRL of future teachers is crucial because it can shed light on the efficacy of these teaching methods in fostering the growth of SRL skills among learners. Researchers can find effective strategies to incorporate into teacher training programmes by analysing the effect of PBL and FLS on future teachers' support of students' SRL. In the long run, this could help students and encourage continued education. Therefore, providing an in-depth explanation of the study's motivations and benefits is crucial. This research is novel in that it focuses on the use of PBL as a strategy to improve self-regulation skills among pre-service Islamic Studies teachers. Project-based learning is a well-established pedagogical approach, but its application to Islamic Studies and teacher education has not been thoroughly investigated.

This article provides a framework for how the application of PBL among pre-service Islamic Studies teachers fosters their self-regulation skill sets. Early exposure to cutting-edge strategies by utilizing new technologies for pre-service was one of the main incentives to promote pre-service Islamic teachers regarding their teaching practices. In addition, teachers with strong SRL skills are better equipped to assist their students in developing these skills, thereby enhancing student learning. By investigating the self-regulation skills of pre-service teachers through PBL, we can better prepare future educators to foster the self-regulation of their students. In addition, among the novel pedagogical approaches, PBL stands out as having been shown to increase students' capacity for SRL skills. The success of PBL can be better understood by studying the effects on pre-service teachers' abilities to self-regulate; accordingly, this study aims to answer the following questions:

(1) What perceptions do Islamic Studies pre-service teachers hold about implementing an FLS in their early field practice?
(2) What difficulties did Islamic Studies pre-service teachers encounter in applying an FLS during their early field practice?
(3) What SRL skills did Islamic Studies pre-service teachers acquire throughout the process of planning, designing, and implementing the FLS?

2. Self-Regulated Learning Skills and the Project-Based Learning Approach

Self-regulated learning relates to the process of promoting autonomy and control over students' learning approaches and outcomes. The systematic control of motivation, thought, and behaviour in pursuit of learning goals characterises self-regulated learning (Zimmerman & Moylan, 2009).

"Self-regulated learning describes cyclical processes learners use to guide their thoughts and actions before, during, and after engaging in learning tasks" (Brenner, 2022, p. 2). By adopting self-regulated learning skills, learners become actively engaged by anticipating goals, planning, utilizing task strategies, managing time, reflecting on the effectiveness of previous learning strategies, and adjusting future learning as required (Nugent et al., 2019; Russell et al., 2022).

Conde Gafaro (2019) pointed out that self-regulation included various opportunities for students to grow and achieve self-efficacy within their learning context. Promoting students' sense of self-efficacy and self-control develops their SRL skills, encouraging their active motivation and metacognitive involvement within their learning context. Zimmerman and Pons (1986) and Pintrich (1999) described the four main domains of SRL skills and strategies, as shown in Figure 1.
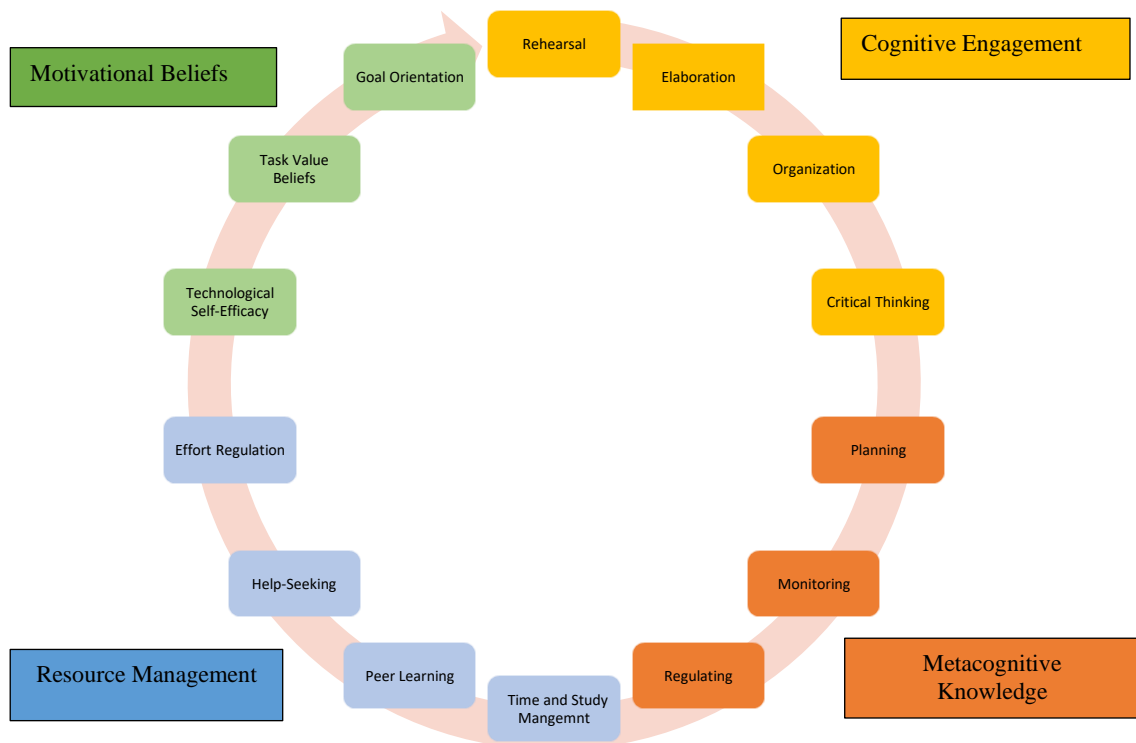

Figure 1: Self-regulated learning strategies

The elements of SRL strategies presented in Figure 1 refer to the capability of controlling and directing one's own learning. Self-regulated learning is the application of various skills and strategies to assist learners in monitoring and regulating their own learning processes, as well as identifying and overcoming potential obstacles. The four primary domains of skills and strategies for SRL are:

- Metacognitive skills: the awareness and understanding of one's own cognitive processes, as well as the ability to plan, monitor, and evaluate one's learning progress.
- Cognitive strategies, such as elaboration, organization, and rehearsal: used to process and retain information.
- Motivational and affective strategies: used to manage an individual's motivation, emotions, and beliefs regarding learning. Examples include setting goals, seeking feedback, and using positive self-talk.
- Behavioural strategies: used to manage one's behaviour and environment to support learning, such as time management, seeking assistance, and effective resource utilization.

These skills and strategies can help students become more effective, independent, and self-directed learners if they are understood and developed.

There is notable agreement on the essentiality of fostering SRL, which requires effective operative approaches (Zarouk et al., 2020). Studies have shown that PBL is one of the primary efficient approaches for fostering self-regulated learning skills (Zarouk et al., 2020; Zimmerman & Campillo, 2003). Project-based learning provides students with opportunities to become central in their learning, working autonomously in a complex and authentic learning context with the teacher's guidance and facilitation to create their projects and accomplish genuine learning outcomes (Hira & Anderson, 2021). Markham (2003) defines PBL as "a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks" (p. 4). Project-based learning pedagogy requires students to construct their own learning experience based on prior knowledge and through teacher guidance. Learning through PBL pedagogy has shown positive attitudes and higher levels of academic achievement among students. Introducing students to non-traditional student-centred learning environments can reinforce self-regulated learning outcomes (Stefanou et al., 2013). Introducing students to working with projects is considered an open-ended task; it emphasizes students' motivation by providing them with a learning environment that promotes decision-making, planning, self-management, and reflection on their performances (Oweis, 2018).

Various studies have examined the effectiveness of PBL implementation on students' SRL skills. For example, Mou (2020) examined students' PBL experiences regarding 3D design in a computer science course and found that embracing PBL reinforced students' sense of confidence, motivation, SRL skills, and attitudes. Similar results appeared in a study conducted by Kardipah and Wibawa (2020), concluding that the implementation of flipped PBL had a notable impact on students' achievement in computer skills and promoted their engagement and self-management skills. Further, a study conducted by Shih and Tsai (2017) investigated students' attitudes towards the use of the flipped classroom approach to facilitate online project learning in a marketing research course; results revealed that using the PBL approach in the flipped classroom promoted students' learning motivation, interest, and learning effectiveness.

Martinez and Tinoca (2022) investigated secondary school teachers' experience in learning 21st-century skills through designing and implementing the PBL curriculum. Their study showed that integrating the PBL strategy during their preparation years helped them develop self-efficacy to highlight students' learning needs for the 21st century. Results indicated that using PBL profoundly affected students' SRL, represented in motivational beliefs, metacognitive strategies, regulation persistence, and peer learning.

Previous studies have provided insightful recommendations about the significance of integrating the PBL strategy to promote SRL skills among learners. Teachers' initialization in designing the learning environment and endorsing support strategies plays a vital role in fostering their readiness to provide students with authentic learning experiences. This readiness begins within the context of pre-service teachers' preparation, which allows the transformation of what has been acquired in academic learning into practical skills that can be applied as future teaching practices (Farnan et al., 2014; Hemker et al., 2017). Introducing student teachers to innovative teaching practices helps them acquire authentic learning experiences to support personal development, and prepares them for prospective professional goals (Tsybulsky & Muchnik-Rozanov, 2019). Encouraging future teachers to incorporate PBL into their courses will promote various skills, such as innovation, creativity, problem-solving, critical thinking, communication, and collaboration (Häkkinen et al., 2017). It can also help student teachers develop awareness and positive attitudes towards their learning goals (Ljung-Djärf et al., 2014).

The PBL implemented in the current study involved assigning Islamic Studies pre-service teachers to design and teach according to an FLS within their field practice. Flipped learning strategies employ technology to transform the learning process, fulfil students' needs, and promote their skills (Robert, 2014; Zainuddin & Attaran, 2016). Technology provides a logical rationale for teachers to restructure their classes and make online materials accessible to students, reducing course length compared to conventional methods (Zainuddin & Attaran, 2016). Pre-service teachers are encouraged to experience and practise educational innovations such as FLS within their academic preparation to acquire a blend of skills, knowledge, and competence for subsequent teaching (Zappe et al., 2009).

3. Flipped Learning Strategy

Flipped learning is organized and blended learning that uses instructional techniques within the learning process (Best, 2017; Fulton, 2014; Kim et al., 2014). Bergmann and Sams (2014a) defined the flipped classroom as direct instruction done through video that students can use individually before coming to class. The Flipped Learning Network (2014) defined it as a pedagogical approach that transfers instruction from the group to the individual learning space and transforms the group space into a dynamic, interactive learning environment.

Flipped learning is a cutting-edge innovation meant to address the weakness of conventional education and help students develop thinking skills. The concept is

based on the core of the learning process. Students develop autonomous learning that empowers them to reflect on the introduced knowledge. Class time is invested in activities and direct interaction with students (e.g., tasks, solving problems, and accomplishing projects). This new method of instruction has influenced and refined the lecture-based models from which they evolved, and will continue to do so. Collaborative learning, peer-assisted learning, and problem-based learning are just a few of the growth opportunities made possible by student-centred, active instruction in the digital world (TONG & Li, 2023).

Research has confirmed that such interaction can significantly promote students' satisfaction with and the effectiveness of their learning experience. The FLS relies on teachers' experimentation with new concepts, such as the use of audio and visual technology, and simulation programmes that are accessible to students before the lesson. The available overtime is thus allocated to allow the comprehension of unique concepts based on student individuality (Best, 2017; Kim et al., 2014; Mazur et al., 2015).

The FLS is characterized by several advantages, such as raising student achievement levels, using class time optimally, introducing students to content before class, providing a mechanism to assess student comprehension, and helping teachers evaluate students' understanding of content, which allows teachers to reflect upon their outcomes. The FLS provides students with immediate feedback in the classroom and encourages communication through group work. Further, it creates a productive relationship between students and teachers and promotes the optimal use of modern technology in education (Bergman & Sams, 2014b).

Recent studies have shown how important it is for educators to be proficient in using technology in the classroom (Fraillon et al., 2020; Zhang et al., 2023). The teacher's role in FLS is centred on mastering the design of lesson materials using specialised software, observations, feedback, and evaluation; adopting student-centred learning methods; creating an active learning environment, and encouraging group communication and work (Bishop & Verleger, 2013; Hamad & Alnaqbi, 2017; Le Roux & Nagel, 2018; Wen, 2008, 2013). The learners' role is to raise questions about online materials, organize their ideas, use visual schemes for what they understood from the lesson video, collaborate to accomplish various tasks, interact, learn effectively with the technology used outside the classroom, promote self-learning, and acquire experiences and communication skills (Fulton, 2014). The FLS implementation has many challenges, such as the selection of appropriate technology and lack of early exposure. Furthermore, the absence of face-to-face interaction in the recorded lessons might be problematic for some students (Hamad & Alnaqbi, 2017; Sutia et al., 2019).

4. Islamic Studies and Innovative Teaching Practices
Utilizing instructive innovation has been long dismissed in the field of Islamic instruction. It has been accepted that Islamic learning is a revealed or consecrated message, and it should not be broken down or taught in ways that incorporate innovation, so that the knowledge undergoes minimal changes. The essence of

Islamic education lies in developing a balanced personality, helping students build knowledge, and promoting critical-thinking skills. Besides instilling Islamic values, Islamic education emphasizes appropriate behaviours that reflect students' personalities and actions (Alkhawaldeh & Eid,2004).

Some Islamic schools, and even Islamic education departments in colleges, which prepare prospective teachers, continue to limit their teaching methods to rote learning, despite widespread encouragement and precedents in the long history of Islamic instruction to do otherwise. Having only Islamic Studies knowledge — without considering innovative, forward-thinking approaches to education — in which teaching has continued to be limited to conceptualization and retention, is seen as a major barrier (Zedan et al., 2015). Traditional methods of instruction like lectures, discussions, and presentations are still heavily used in the College of Education at Kuwait University to teach Islamic Studies. Therefore, it is crucial to improve the quality of teaching methods for Islamic Studies and develop cutting-edge strategies by incorporating technology (Alkandari, 2015).

Many Islamic Studies teachers confront challenges throughout various teaching stages, such as interpreting Islamic educational concepts to achieve the memorisation and retention of information. These difficulties weaken teachers' abilities to teach the subject and hinder the planned learning objectives. This shows the necessity of replacing conventional teaching practices with innovative, critical teaching strategies to reach authentic Islamic education objectives and promote students' skills and personalities (Zedan et al., 2015; Mostafa, 2016).

Active teaching strategies are likely to have a positive learning effect on students because teachers are obliged to put in more time and effort to make their subjects more interesting to students. In addition, students' overall academic performance is connected to teachers' pedagogical approaches, even if those approaches have little to do with individual students' grades. Therefore, to guarantee students' success, teachers need to focus on promoting students' active engagement (Wardat et al., 2022).

Teachers' practices and experiences play a significant role in fulfilling learning outcomes and developing students' thinking skills by introducing various concepts and encouraging their active involvement in the teaching process. Consequently, pre-service teachers must be exposed to the latest methods that enrich their teaching experiences. Teacher training programmes at higher education institutions should enhance and shape prospective teachers' theoretical understanding and practices for innovative teaching compatible with international education theories (Best, 2017; Mostafa, 2016; Richards & Hemphill, 2018). Higher education must help qualitatively prepare pre-service teachers and seek outputs that focus on content creation within their learning arena rather than merely on content mastery. Contemporary teacher training needs to consider that novel trends and the latest educational research, training in active learning practices, and immersion in practical learning experiences can produce skilled and qualified teachers (George & Mallery, 2003).

Accordingly, this study aimed to investigate various intertwined aspects concerning Islamic education of pre-service teachers' work on a senior project based on the application of a PBL strategy by assigning them to design a flipped classroom to be implemented within their field practice. The researchers tackled different angles to understand participants' perceptions toward planning the project, which included creating a flipped classroom and what skills they attained through the process of designing and applying the project. This study sought to reveal if applying the PBL pedagogy affected SRL skills development throughout this experience. This study focused on revealing the nexus between theory and practice in Islamic Studies pre-service teachers' perceptions toward matching their actual patterns of exposure, practising innovative teaching within their academic preparation, and addressing the crucial role of early exposure among prospective teachers in shaping their teaching experiences for a future profession.

5. Methodology
5.1. Research design
This study applied qualitative and quantitative approaches to answering the study questions through a questionnaire, unstructured interviews, and written reflections related to the design and application of the FLS. To answer complex research questions, sometimes qualitative and quantitative methods alone are insufficient. By combining both approaches, researchers can gain a deeper and more nuanced understanding of the research problem.

In this study, Islamic Studies pre-service teachers designed and implemented an FLS project as part of their graduation project course in teaching Islamic Studies at the College of Education, Kuwait University, during the academic year of 2019/2020. Pre-service teachers are the students who are enrolled in the College of Education to become teachers in the future. The project they were introduced to required planning, designing, and implementing FLS during their preparation for their early field practice. This project lasted two semesters for student teachers registered for a course titled "Graduation project in teaching Islamic Studies," which was parallel to their enrolments in their field practice. The participants were introduced to the theory and practical application of both PBL pedagogy and FLS in previous courses, titled "Principles of Teaching Islamic Studies 1" and "Principles of Teaching Islamic Studies 2," which were prerequisites for the graduation project. They were required to apply the PBL strategy by designing an FLS to transition from theory to actual practice and from learning to employment. Throughout this experience, pre-service teachers reflected upon this practice and revealed their perceptions, while also addressing the primary SRL skills they developed.

To fulfil the graduation project, pre-service teachers went through several phases, starting with planning, designing, and executing the FLS project and finalising it by presenting and sharing their practices with their classmates. Each pre-service teacher shared their input, the skills they developed, and attitudes toward teaching a class using FLS within their field practice. Feedback and constructive critique from the instructor and classmates were offered.

5.2. Participants

Data were collected from 95 pre-service Islamic Studies teachers from the College of Education at Kuwait University who enrolled in the course "Graduation Project in Teaching Islamic Studies" for two semesters. They were required to plan, design, and execute a flipped learning classroom as their graduation project and to implement it within their field practice classes.

5.3. Research instruments and validity

The research employed both quantitative and qualitative methods, with a questionnaire serving as the primary instrument for data collection. The purpose of the questionnaire was to investigate the perceptions of pre-service Islamic Studies teachers regarding the implementation of FLS in their early field practice, as well as to identify any challenges they might encounter when implementing this strategy. A comprehensive literature review was conducted to develop the questionnaire, and appropriate measurement scales were created. The questionnaire was then validated by presenting it to a group of curriculum and instructional methods experts from the College of Education at Kuwait University. Their feedback and suggestions were used to modify the questionnaire, and their consensus was used to create the final version of the questionnaire and validate its content. In addition, experts in the field were asked to review the questionnaire and provide feedback on its relevance and adequacy, which helped establish the validity of the content. Two evaluations are required for content validity: the measurable scope of each item for defining the traits and the set of items that represent all aspects of the traits (Yaghmaie, 2003).

The questionnaire statements were written in Arabic and electronically distributed among participants. The questionnaire consisted of two parts: the first related to pre-service teachers' perceptions toward implementing FLS, and the second related to difficulties encountered in implementing FLS. The questionnaire answers were scored according to a five-point Likert scale ranging from *1=strongly disagree* to *5=strongly agree*. The responses were constructed arbitrarily according to a theoretical framework with two main dimensions: 1) student teachers' perceptions of implementing the FLS project in field practice; and 2) difficulties they encountered when applying FLS. The study also aimed to highlight participants' acquisition of SRL skills. According to George and Mallery (2003), Cronbach's alpha scale reliability values for the two domains constructed in this study were high and varied from "good" to "very good." The overall Cronbach's alpha coefficient was 0.755, as shown in Table 1, indicating that the instrument had good reliability.

Table 1: Cronbach's alpha value for the study domains

Dimension	Number of statements	Cronbach's alpha (n=20)
Pre-service teachers' perceptions toward implementing FLS	20	0.884
Difficulties encountered in implementing FLS	4	0.781
Overall reliability	24	0.755

FLS = flipped learning strategy

To gain a more comprehensive understanding of the SRL skills participants acquired through the design and implementation of their FLS project, a qualitative approach was used. Unstructured interviews were conducted with 20 participants to collect data and gain insight into their experiences. The 30- to 45-minute unstructured interviews were conducted online, digitally recorded, and transcribed. In addition to the interviews, participants' written reflections on the design and implementation of the FLS were collected after the completion of their projects to obtain additional qualitative data. This multifaceted approach enabled a comprehensive understanding of the experiences and perceptions of the participants, thereby enhancing the analysis process.

5.4. Ethical consideration
The Kuwait University Institutional Review Board waived permission because the study used an anonymous questionnaire. Participation was voluntary and respondents had complete freedom to answer any survey questions. In addition, students were reassured that their participation in the study was voluntary, their identities would remain confidential, and they could request to see the transcription of the unstructured interviews. Data collection followed the Helsinki Declaration.

5.5. Analysis
The questionnaire responses were analysed using SPSS v.25.0. A total of 95 questionnaires were received; they were filled, verified, checked, and matched manually. The qualitative methods exemplified by the unstructured interviews were recorded, transcribed, and coloured for coding, and the data were labelled, reorganized, and categorized into themes to draw conclusions. Data analysis revealed significant patterns. As we connected patterns to our research questions and the literature, themes emerged. The language, phrases, and quotations of the subject of the study were carefully examined utilizing multiple data collection techniques to enhance the credibility and validity of research results through translation. Furthermore, the collected data were revised to identify significant patterns. The researchers closely examined each sentence, phrase, and response that coincided with the research question or interest (Bull et al., 2012; Mohajan, 2018) to reach credibility.

6. Findings
This research was motivated by three distinct objectives related to (a) Islamic Studies pre-service teachers' perceptions toward implementing FLS in their early field practice, (b) exploring difficulties encountered in implementing FLS, and (c) SRL skills acquired throughout the process of planning, designing, and implementing the FLS. This section presents the answers for the research questions.

Results related to the first question regarding Islamic Studies pre-service teachers' perceptions toward implementing FLS in their early field practice are shown in Table 2.

Table 2: Mean, standard deviation, and rank for each statement's response — pre-service teachers' perceptions toward implementing FLS (N=95)

Statements	M	SD	Rank	Degree
It enhanced the technological skills in my teaching practices.	4.60	0.64	2	High
It promoted effective communication among students.	3.96	0.84	17	High
It raised my professional development level as a teacher.	4.24	0.95	6	High
I can dispense teaching according to the traditional strategies.	3.14	1.14	20	Moderate
I find greater flexibility in teaching according to FLS than with traditional teaching strategies.	3.78	1.10	18	High
I support FLS application at a higher level in schools and universities.	4.25	0.87	5	High
FLS enhances learners' confidence in their abilities.	4.20	0.82	11	High
FLS raised learners' self-responsibility and encouraged autonomous learning.	4.44	0.71	4	High
FLS greatly encourages peer coaching.	4.17	0.81	13	High
FLS increased the degree of verbal and cognitive interaction.	4.19	0.90	12	High
FLS promoted higher-level thinking skills such as problem-solving, analysis, and critical-thinking skills.	4.24	0.82	7	High
I greatly encourage frequently utilizing and implementing the FLS in Islamic Studies classes.	3.53	1.15	19	Moderate
Applying the FLS helped me achieve my professional potential.	4.07	0.89	15	High
FLS developed academic and personal skills among learners, such as constructivist dialogue and discussion.	4.23	0.83	8	High
Using FLS provided extra time for learners to develop and work on their academic and social skills and thinking abilities.	4.22	0.76	9	High
It required a skilful and well-planned lesson to present the material technologically.	4.74	0.59	1	High
FLS helped me make the best use of class time.	4.53	0.73	3	High
FLS allowed me to employ various strategies and activities in the classroom.	4.04	1.00	16	High
FLS facilitated learners' access to the lesson materials.	4.22	0.90	10	High
Learners showed noticeable enthusiasm about implementing FLS in communication and discussion.	4.14	0.94	14	High
Overall scale	4.15	0.94		High

M = mean; SD = standard deviation; FLS = flipped learning strategy

The three statements with the highest mean scores warrant further deliberation. The statement, "It required a skilful and well-planned lesson to present the material technologically", came first in the domain of students' perceptions toward implementing FLS (Mean=4.74, SD=0.59). Most of the surveyed students (94.7%, n=90) agreed that using FLS required a skilful and well-planned lesson to present the material technologically and gave it a high degree of importance. Such a statement coincides with studies suggesting that FLS depends on online lectures, which must be designed and presented creatively and interactively (Haghighi et al., 2018; Xiao et al., 2018). Innovation requires intensive training to promote student and teacher skills. Accordingly, pre-service teachers are expected to highlight the creative element and possess critical-thinking skills to create a learning context to reach learners' potential. In addition, it disputes the misconception that Islamic Studies lack innovation and technology integration. Applying an FLS project promotes higher-level mental processes, competencies, and abilities in teachers and, eventually, in their students (Kutahnecioglu Inan et al., 2019; Ahmad Uzir et al., 2020).

The second statement, "FLS enhanced technological skills in my teaching practices" (Mean=4.60, SD=0.64), had a high degree of importance and 95.8% (n=91) agreement. Kutahnecioglu Inan et al. (2019) and Best (2017) supported the same result with case studies that found FLS facilitated learning and positively enhanced acquisition skills. They also affirmed that FLS "makes the teachers technologically savvy and more updated with recent pedagogical practices" (Kutahnecioglu Inan et al., 2019, p. 216). One of the leading higher education objectives is to reshape prospective teachers' perceptions of the learning sphere. These teachers are more likely to be willing to integrate the learning experience and acquired skills in their future teaching profession (Best, 2017).

The third statement, "FLS helped me make the best use of class time," had 92.6% (n = 88) agreement. This result is significantly similar to Ahmad Uzir et al. (2020), who pointed out that managing class time effectively will likely result in higher engagement and activate authentic learning and interaction, promoting self-regulation and enhancing positive academic performance. Effective utilization of class time in FLS helped both pre-service teachers and their learners achieve the anticipated learning objectives with qualitative outcomes. As learners watched the designed video or online lectures outside of school, class time could be devoted to activities and engagement, encouraging genuine interaction (Ahmad Uzir et al., 2020; Kutahnecioglu Inan et al., 2019; Nguyen et al., 2016).

The lowest-scored statements must also be noted. "I greatly encourage frequently utilizing and implementing FLS in Islamic Studies classes" came second to last, with moderate importance in the domain of students' perceptions of implementing FLS. Slightly over half of the students (53.7%, n=51) highly encouraged frequently utilizing and implementing FLS in Islamic Studies classes. The respondents may have limited experience with, or knowledge of, the FLS method. They may not fully comprehend how it operates or how it could be utilized in Islamic Studies classes. Therefore, they may have trouble evaluating

the statement or be hesitant to adopt a new strategy without adequate information or training.

This result coincides with those of Alyosef (2017) and Jannah (2018), which explain that Islamic Studies teachers fear undermining the respected status of Islamic Studies academic content. Thus, there might be some obstacles preventing Islamic Studies teachers from applying blended learning. It is important to note that the resistance toward integrating technology into Islamic teaching practices is related to teachers not understanding how to utilize it to enhance the learning process owing to antagonism toward the technology itself (Göl, 2012).

The statement "I can dispense teaching according to the traditional strategies" was last, with moderate importance and 33.6% agreement. Student teachers might be sceptical about adopting FLS as the sole teaching method and may not be willing to abandon traditional teaching strategies due to factors such as a lack of self-confidence about their skills, or feelings of worthlessness. The transition to innovative teaching methods carries challenges, especially without previous exposure. Further, there may be a lack of motivation to employ this strategy if their learners are less engaged (Cantrell & Hughes, 2008; Thompson & Mombourquette, 2014).

It is worth mentioning that the general agreement among pre-service teachers toward implementing the FLS project was 79%. Therefore, it is highly recommended to consider Islamic Studies pre-service teachers' perceptions when implementing the project.

6.1. Difficulties encountered in implementing FLS.
Table 3 presents the descriptive statistics of the responses to the second question concerning difficulties encountered in implementing FL.

Table 3: Mean, standard deviation, and rank for responses to each statement — Difficulties encountered in implementing FLS (N=95)

Statements	M	SD	Rank	Degree
I faced difficulties in applying FLS in my classes.	3.06	1.18	3	Moderate
I refuse to record my voice for the video for FLS.	2.67	1.31	4	Moderate
Learners found it challenging to commit to watching the assigned video for FLS.	3.78	1.19	1	High
It is challenging to apply FLS in most Islamic Studies classes.	3.52	1.19	2	Moderate
Overall scale	3.26	1.29		Moderate

M = mean; SD = standard deviation; FLS = flipped learning strategy

All surveyed pre-service teachers were assigned to a middle school for their field practice, to focus on the application of FLS for middle-school students. The statement "Learners found it difficult to commit to watching the assigned video for FLS" ranked first in the domain of difficulties teachers encountered in

implementing FLS. Most surveyed participants (64.2%, n=61) reported that, with a high degree of importance, their learners found it difficult to commit to watching the assigned video for FLS. This may be because some students struggle with self-directed learning and have different learning styles. It might also take time and the availability of resources for students to benefit from watching instructional videos.

Studies that used FLS for undergraduate students showed positive feedback for online lectures (Nguyen et al., 2016; Thompson & Mombourquette, 2014; Zavattaro et al., 2018). Quarato (2016) indicated that FLS could be used widely in both undergraduate and graduate learning environments. However, it might not be as favorable for middle- and high-school students unless the content is aimed at college preparation; younger learners are not yet sufficiently self-motivated and self-regulated. The success of FLS relies on learners' willingness to use the assigned materials or online videos and lectures and their motivation to undertake intensive and substantial self-learning.

The statement "FLS is difficult to apply in most Islamic Studies classes" ranked second, with a moderate degree of importance and agreement of 56.9% (n=54). This result differs from Jannah (2018), where Islamic Studies teachers expressed their satisfaction with utilizing blended learning strategies, including FLS. This difficulty was also confirmed through pre-service teachers' responses to the open-ended questions in the present study, where they shared that it was their first experience teaching using the FLS method. Examples of these obstacles include learners' resistance to doing out-of-class schoolwork, inadequate technical training, and efficacy. The general agreement on the difficulties of implementing FLS was 36.6%. From the pre-service teachers' perspectives, the degree of challenges encountered while implementing FLS projects was moderate. It is worth noting that a number of factors, including pre-service teachers' experience and training, available materials, and institutional support, may contribute to the moderate degree of difficulty. In addition, the context in which FLS is used and the particular FLS approach employed can both affect the difficulty level.

6.2. SRL skills Islamic Studies pre-service teachers acquire throughout the process of planning, designing, and implementing the FLS.

Regarding the acquired SRL skills of the Islamic Studies pre-service teachers, we found that they underwent a multifaceted learning experience that implicitly targeted SRL skill reinforcement through planning, designing, and implementing the FLS project in their field practice. The most prominent skills participants acquired through applying the project related to the following four domains of SRL skills.

6.2.1. Cognitive engagement

This domain comprised various skills (rehearsal, elaboration, organization, critical thinking). The participants demonstrated that they went over the scheme of their projects several times. The rehearsal process was intended to achieve the anticipated goals. In this process, they re-connected to the skills and knowledge they had attained in the previous courses for teaching Islamic Studies. This phase

allowed the participants to avoid or minimize errors through practice. One participant expressed that each attempt in planning and designing the FLS project was fruitful, "I discovered the flaws and mistakes I have done [*sic*], and through constant amendments, these trials boosted my self-confidence and helped optimize the quality standards of the project."

The participants also expressed that being introduced to such an innovative project helped them navigate through updated methods to execute the project creatively. They incorporated new applications and examined their technological skills and teaching strategies:

> *"Working with this project, I utilized the knowledge and skills I have developed in previous courses; the previous exposure helped me master the execution of the project. This project was, for me, the vessel in which acquired experiences are poured."*

Several aspects catalysed the organizational skills throughout project implementation. The participants organized information needed for the videos. They also selected the topics and knowledge that required emphasis and introduced it in an intriguing style and sequence. They worked on linking the FLS project plan to the targeted objectives:

> *"I went through various stages to finalize the project, from allocating the time throughout the day. I imagined my project going through planning, how I want to execute the FLS, the strategies I wanted to include, selecting pictures to design appealing videos. I jotted down any probed ideas I wanted to incorporate in my notebook and juggled them to reach cohesion regarding accomplishing the educational objective of the lesson."*

Throughout this experience, critical-thinking skills were activated:

> *"Imagining how to transform the lesson into a video led me to envision the execution process from various perspectives, and intellectual skills were promoted, such as imagination, curiosity, solving problems, flexibility in producing ideas and testing them, also evaluation, creativity, and looking for alternative ways to finalize the project."*

Although this finding may affect students' cognitive engagement in settings where attitude, prior learning experiences, and rigidity are common barriers to the implementation of PBL, it is consistent with the findings of Umar and Ko (2022) that implementing PBL and flipped learning have direct effects on learning effectiveness and engagement (Ssemugenyi, 2023).

6.2.2. Metacognitive knowledge

Metacognitive knowledge comprises skills such as planning, monitoring, and regulating, where the participants practise various intellectual processes leading to intrinsic self-awareness toward achieving the FLS project with high standards. They visualize the initial project plan by jotting down their ideas, selecting the most suitable, and conducting intensive research and reading to accomplish project objectives while solving associated problems. The participants were cognitively and metacognitively active in brainstorming ideas, managing time limitations, and selecting effective and creative strategies to finalize the project. In

conjunction with the planning process, they monitored their work progress, revising it to accomplish their goals. The constant revision led students to observe and discover project strengths and weaknesses, prompting them to ask for instructor or classmate feedback. This process helped them build self-confidence and self-control to achieve authentic learning outcomes. Peer coaching was also reinforced by exchanging information with their peers.

Studies have indicated that students developing metacognitive knowledge reflect positively on their performance (Broadbent & Poon, 2015; Dumford & Miller, 2018; Goradia & Bugarcic, 2017). One participant explained the monitoring procedure she developed:

> "I thoroughly observed how I aimed to execute the project. I learned significantly from discussing ideas with my classmates, which polished my final work. The questions and ideas presented during group discussions were productive. Revision, revision, and revision are what helped improve the project, even though it was time-consuming and kind of perplexing for me, but I eventually managed through it."

As a key indicator of success in learning, metacognitive skills have the potential to cultivate higher order thinking. Students actively engage in the process, grow in confidence as they gain responsibility, and improve their ability to learn and evaluate strategies through questioning and seeking. The process of group discussion can also be used to activate metacognitive skills. Project-based learning's collaborative activities, such as student discussions, questions, and analysis of one another's ideas, can foster critical and metacognitive thinking (Dwi Hastuti et al., 2022; Haryani et al., 2018). Students are more likely to put in the effort required to succeed in school if they are equipped with effective metacognitive strategies for learning, such as making study plans, keeping track of their progress, and evaluating what they have learned. Numerous studies have found that students' academic success can be accurately predicted by their use of metacognitive learning strategies (Almoslamani, 2022; Li et al., 2023; Wei et al., 2023).

6.2.3. Resource management
The third domain of the SRL skills is resource management, comprising time and study management, effort regulation, peer learning, and help-seeking strategies. One significant concern related to time constraints was juggling between reading, researching, planning, and executing the project. Students pointed out that selecting the lesson for transformation to the FLS project was time-consuming; however, they managed to fulfil their intertwined tasks within the period. Constant revisions affected loss of time:

> "I must divide my time wisely to select the topic, researching innovative approaches to design the FLS project. I went through a self-brainstorm with various ideas and received constructive feedback from the instructor and classmates that reduced effort and time to finalize my work. Dealing with all these various intertwined tasks in a constructivist-learning environment positively reflected on the quality of the project."

Students' success in managing their resources catalysed various elements among the participants, such as peer learning and help-seeking. This project shed light on how students collaborate with their classmates and work individually to finalize their projects. Collaboration involved asking questions, seeking advice regarding the design process, navigating the best software or applications to be combined with FLS, and providing constructive feedback to their peers:

> "Through the project, we get to discuss our ideas, brainstorm our designs; I wasn't hesitant to ask for help, and all these intellectual interactions between us helped me avoid mistakes, unexpected obstacles toward improving my project to reach higher levels of quality outcomes."

Another participant explained that seeking help "*led me to appreciate the value of teamwork and promoted my communication skills. It also boosted my confidence and underlined my strengths and weaknesses holistically within the learning experience in finalizing the project.*" Thus, social interaction fosters students' development of effective cognitive learning strategies (Zhu, 2012). In addition, students should be trained in a variety of learning strategies, such as restating knowledge; refining and organizing it; and planning, monitoring, and regulating their learning behaviour. Simultaneously, instructing them in time and space management, as well as how to seek assistance when stuck, is crucial (Lim et al., 2021).

6.2.4. Motivation beliefs
Motivation positively affects students' performance and is a vital factor that helps learners pursue tasks and challenges their abilities toward achievement (Panadero, 2017). The motivation domain strongly relates to learners' emotions and beliefs, emphasizing three strategies **(**technological self-efficacy, task value beliefs, and goal orientation) with as much significance as the cognitive aspect (Lilian et al., 2021).

The participants were intrinsically motivated and determined to confront challenges and complete their tasks. They made a genuine effort toward meeting the project criteria:

> "At the beginning of introducing the project, I was not motivated and lacked the drive to work on it, especially since the project was a novel practice for me. I doubted my skills to work on it; however, the learning atmosphere was authentic, motivating, and challenging. The instructor took the initiative to guide us toward the final product; such support nurtured us to learn new skills related to technology, design, and challenged us toward executing high-quality work. I found myself throughout this experience intrinsically motivated to put the utmost effort into a creative project."

The participants realized the significance of autonomous learning in applying the FLS project. They noted their intrinsic motivation and appreciated their growth during this endeavour. Being introduced to innovative teaching practices as students and prospective teachers elevated students' self-awareness, self-control, focus, and goal orientation.

> "Throughout the phases of this project, I developed self-awareness and worthiness toward skills and capabilities I acquired to optimize my

futuristic [sic] teaching practices. I realized the value of self-learning, reading, and research to make my future classes intriguing. I aim to provide my future students with genuine and authentic learning experiences."

Sun and Rueda (2012) have questioned the motivational factor as an authentic indication of excelling students' learning outcomes; they have noted a lack of correlation between self-efficacy and learning performance.

7. Discussion

This study explored the perceptions of pre-service teachers in the field of Islamic Studies toward their implementation of an FLS project and revealed the SRL skills they developed through this experience. The results showed that participants held high positive perceptions toward working on their FLS projects. Initially, they had the opportunity to test what they had been introduced to in the prerequisite courses for teaching Islamic Studies, and they transformed their knowledge into practice. The participants showed appreciation of and competence in technological and self-regulated skills, which deepened their conceptual understanding of their specific learning arena (Best, 2017; Ahmad Uzir et al., 2020).

Pre-service teachers appreciated that FLS design and planning helped them efficiently regulate class time, which is a crucial SRL skill. The participants witnessed the learners' enthusiasm toward the online videos they were assigned to watch outside class. Using time efficiently allowed the participants to provide learners with constructive feedback and achieve authentic learning outcomes. Replacing instructions with online videos promoted genuine investment of class time for activities, discussion, commutations, and constructive feedback (Angadi et al., 2019).

Overall, pre-service teachers recognize that utilizing FLS projects is an innovative approach often stigmatized in traditional Islamic Studies, which rely significantly on memorization and basic cognitive skills within their pedagogical practices for teaching (Al Saadoun, 2012). The mistaken impression of the intrinsic conservatism of Islamic Studies needs to be corrected by creative teachers who are willing to accept the challenge and conceptualize their beliefs in presenting innovative approaches. This requires constant practice and updating of teaching methods, such as those accomplished with their graduation project. Pre-service teachers are consequently transformed from "passers of the knowledge to the guide of students' knowledge internalization" (Du, 2018).

Even though pre-service teachers confronted challenges and obstacles in applying the FLS, they succeeded in achieving their objectives, promoting academic growth, and attaining competence. The participants developed SRL skills that aimed to help students learn efficiently. Acquiring these skills was not challenge-free, though it was empowering. Bryer and Seigler (2012) defined student empowerment as ensuring that students are fully integrated into mind, body, and spirit with teaching and learning.

The four domains of SRL skills were reinforced by implementing PBL pedagogy. The participants developed a higher sense of cognitive engagement by transforming knowledge from previous courses for teaching Islamic Studies into an authentic FLS project. Rehearsing and activating this knowledge helped them learn through repetition (Effeney et al., 2013). The participants demonstrated positive authentic learning outcomes in creating and implementing the FLS project. Lilian et al. (2021) revealed similar results, indicating that activating cognitive engagement in the learning environment positively affects student performance. Studies have shown that students who take PBL courses have a higher level of SRL when they transition to the actual learning stage, and experienced students are more likely to develop their own learning objectives (Li et al., 2023).

This project also enhanced participants' metacognitive knowledge; they acquired self-awareness of the quality of the effort invested in their tasks. They became more aware of their intellectual capabilities, whether it was planning assignments or monitoring progress, which eventually led to self-control over their learning process. They noted that the constructive feedback from their instructor and classmates boosted their self-awareness and optimized their performance. Such results conflict with some studies reporting that university students showed a lower level of metacognition skills, which are not merely related to the learning process, but to the students' responsibilities toward learning (Hashemyolia et al., 2015; Lilian et al., 2020; Lilian et al., 2021).

Regarding the resource management domain, the participants developed a better sense of time management and efficient engagement with classmates. Such productivity stemmed from the naturalistic learning environment, which facilitated student learning. Teachers hold significant responsibility for providing a stimulating and positive learning environment (Lilian et al., 2021).

Regarding the domain of motivational beliefs, the participants held optimistic views related to the motivation level, whether intrinsically or extrinsically, toward the FLS project. Creating a positive learning environment reflected strongly on learners' performance. Despite the challenges, participants confronted the doubts they held at project onset, and they managed to excel in their achievements through their beliefs or those reinforced by the instructor. Motivation promotes students' sense of self-directed learning through the quality of instruction where educators can predict and encourage students' SRL skills (Hira & Anderson, 2021).

Promoting students' sense of self-efficacy and encouraging the acquisition of SRL skills cannot be accomplished without a naturalistic learning setting. Regarding the complexity of self-doubt and occasional false beliefs that students may hold, this type of learning sphere optimizes students' self-belief and self-monitoring through motivation. The development of self-regulation skills is a multifaceted, complex process that relies on students' traits, abilities, or cognitive levels. It is rooted in various contextual social variables and the nature of tasks and assignments. Accordingly, relying merely on self-regulation skills and their

advantages deprives students of the holistic perception toward feasibility that goes beyond their knowledge and skills to factors such as their implicit sense of self-efficacy and personal perception (Zimmerman, 1995). Overall, the study sheds light on how project-based and flipped learning can be used to improve future Islamic Studies teachers' capacity for self-regulation. These findings have implications for pre-service teachers, Islamic Studies programmes, and the existing literature on these topics.

8. Conclusion

This study provides insight into the positive impact of PBL pedagogy on the SRL skills of pre-service Islamic Studies teachers. The study discovered that participants' exposure to innovative experiences during their college preparation enhanced their ability to implement the FLS project, resulting in enhanced SRL skills. Initially, the participants' negative attitudes toward PBL posed a limitation; however, they overcame this barrier and demonstrated positive attitudes toward the FLS project, gaining a sense of accomplishment and broadening their cognitive and metacognitive awareness. While the study has highlighted the importance of introducing student teachers to PBL through innovative projects, such as the FLS, it is important to recognize that sample size and study context may limit the generalizability of the findings. Despite this, the results of the study suggest that aligning educational programmes with refined-oriented practices can have a positive effect on teachers' perceptions and teaching practices, encouraging them to make their teaching practices more meaningful, authentic, and rigorous, thereby enhancing their students' SRL skills.

Several recommendations can be made, based on the findings of this study to improve the implementation of PBL pedagogy and SRL skills among pre-service Islamic Studies teachers. First, provide adequate training and support to assist pre-service teachers in overcoming their negative attitudes toward PBL and increasing their ownership of the learning process. Second, further explore the impact of PBL pedagogy on the teaching practices and SRL abilities of practising teachers in various contexts. Finally, encourage the alignment of educational programmes with refined-oriented practices to promote the use of innovative pedagogies, such as PBL, to enhance the teaching practices of teachers and their students' SRL skills.

Acknowledgments

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