Empowering Student Entrepeneurship: A 21st Century Learning Approach using TPACK Integrated PjBL Model

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ABSTRACT

The 21st century presents numerous challenges for students, particularly in developing entrepreneurial skills to thrive in a dynamic job market. This study investigates the efficacy of the TPACK integrated PjBL (Technological Pedagogical Content Knowledge integrated Project-based Learning) model in fostering students' entrepreneurial interests within the context of 21st century learning in Islamic Religious Education. A mixed methods research design was employed, involving data collection, analysis, and integration of quantitative and qualitative methods. The study encompassed 90 third-semester students enrolled in the Islamic Religious Education Study Program at UIN Sulthan Thaha Saifuddin Jambi, utilizing a total sampling technique. Statistical tests were conducted, including preliminary tests such as the Kolmogorov-Smirnov normality test on pretest and posttest data. The findings reveal a significant increase in students' interest in entrepreneurship following the implementation of TPACK-integrated and PjBL-based learning. It is evident that employing the TPACK integrated PjBL model positively influences students' entrepreneurial interest. These results have profound implications for educators and policymakers, highlighting the importance of integrating the TPACK integrated PjBL model within Islamic Religious Education to enhance entrepreneurial skills and better equip students for the competitive job market. Additionally, this study emphasizes the potential for further research on technology-enhanced pedagogical approaches across various educational contexts to foster the development of 21st century skills.

1. Introduction

The 21st century's era of globalization, driven by technological and scientific advancements, has fundamentally transformed human existence, making technology an inseparable aspect of daily activities. The implementation of the Asian Economic Community (AEC) in 2016 further intensified competition across all domains. In this context, Indonesia emerges as the largest consumer of foreign products, encompassing primary, secondary, and tertiary necessities. This reality underscores Indonesia's current struggle to succeed in trade competition and its existing lack of highly skilled human resources.

Education should be at the forefront of answering the challenges of winning the competition in the field of trade. The learning process in schools must be adapted to the times and needs. Education needs to develop students' entrepreneurial interests to answer the challenges of the 21st century. In addition, Indonesia is not only a consumer but can become a producer. However, at this time education in Indonesia is still oriented towards learning outcomes. Creativity product or crafts and entrepreneurship learning carried out by the 2013 curriculum which is expected to be a solution in answering this challenge is not optimal because the nature of learning is still rote and does not provide opportunities for students to apply knowledge (Marbun, 2021; Pandangwati et al., 2018; Setiawan & Sukanti, 2016; Wang, 2019).

Currently, only a little learning and research is carried out to provide opportunities for students to develop students' entrepreneurial interests (Pandangwati, 2018; Sudirman, 2018). As a society with the world's largest Muslim population, there are

ample opportunities for Islamic Religious Education to play a significant role in cultivating human resources with a strong entrepreneurial inclination (Ratten, 2017; Ramadani, 2015). The development of entrepreneurial interests should be tailored to the environment and culture (Souitaris, 2007; Taatila, 2010). In the context of Indonesia, a country with a Muslim majority population (Aenina & Rahayu, 2019), fostering an interest in entrepreneurship through Islamic Religious Education aligns with the local environment and culture. Therefore, Islamic Religious Education in schools should not be limited to theoretical knowledge and rote memorization. Instead, it should provide opportunities for students to apply religious teachings in developing innovative products that adhere to Islamic principles, such as in the fields of food and clothing. These products can then gain support from the community and possess unique characteristics that can be used as marketing icons.

To achieve these learning objectives, an appropriate instructional model is required, one that encourages high-level thinking and the application of knowledge in the development of innovative products in line with Islamic religious rules. The Project-Based Learning (PjBL) model, recommended by the 2013 curriculum (Idkhan, 2017; Marbun, 2021), offers a suitable approach. By implementing project-based learning, students are provided with opportunities to apply their knowledge in solving problems and developing innovative products.

The project-based learning (PjBL) model, as proposed by Hogue (2011), is an established approach that requires adaptation to the changing times. Atmojo (2019) suggests that one way to adapt the PjBL model is to incorporate the teacher's Technological Pedagogical Content Knowledge (TPACK) in project-based learning. By combining TPACK and the PjBL model, teachers and students are provided with opportunities to utilize technology in the learning process, as highlighted by Koh & Chai (2014). This integration of technology in education becomes especially significant in the 21st century, where students can utilize technology to foster their entrepreneurial interests, as stated by M. H. Chen & Cangahuala (2010). By utilizing technology, students can not only innovate but also effectively market their products.

To effectively implement such a learning approach, appropriate learning tools need to be developed. Currently, Islamic religious education learning strategies often rely on general learning tools obtained from the Internet and books, as pointed out by Amin (2017). However, these tools are insufficient in supporting learning that specifically encourages entrepreneurial interest. Therefore, the creation of specialized learning tools, based on the teacher's TPACK knowledge, is necessary to support integrated learning objectives with entrepreneurship content, as emphasized by Pandangwati (2018). These learning

tools can take the form of lesson plans, student worksheets, and teaching materials, ensuring that the project-based TPACK learning (PjBL) approach is easily implemented by teachers and comprehensible to students.

The development of entrepreneurship skills is highly relevant in today's world, as noted by Okudan & Rzasa (2006). Increasing entrepreneurial interest among students involves considering various factors, such as the environment, technology, and current needs. By aligning classroom learning with these aspects, it is anticipated that learning can effectively foster entrepreneurial interest based on students' understanding and appreciation of Islamic Religious Education material, as suggested by Kuckertz (2013). The combination of integrated TPACK-based learning within the PjBL model serves as an initial step in cultivating students' entrepreneurial interest, drawing from their knowledge and experiences through Islamic Religious Education. TPACK refers to the knowledge teachers possess in integrating technology, pedagogy, and content in the learning process, as established by Mishra (2011) and Mishra & Koehler (2006). Wang (2019) further supports the application of TPACK in enhancing students' entrepreneurial interest, providing them with opportunities to adapt their learning to the current business landscape. In the digital era, technology plays an integral role in various aspects of life, including education. The millennial generation, being well-acquainted with technological advancements, relies heavily on technology, as highlighted by Iwu & Nzeako (2011) and Wu (2019). Therefore, it is crucial to effectively leverage technology in the learning process, ensuring that it is both impactful and aligned with the needs of the present, as emphasized by Khairi (2022).

Moreover, integrating technology into the implementation of the Project-based Learning (PjBL) model represents a means to adapt it to current advancements (Bell, 2010; Capraro, 2013). By incorporating technology, teachers can facilitate online learning and effectively monitor the progress of students' projects (Safitri, 2018). Additionally, leveraging technology enables learners to access relevant learning resources from the internet, thereby aiding them in developing the content of their projects.

Furthermore, the application of PjBL in education is considered suitable for fostering students' entrepreneurial interests (Idkhan, 2017; Pandangwati, 2018). This pedagogical approach directs students towards innovation and the development of products aligned with their Islamic knowledge, which serve as projects in their learning journey (Oukil, 2013; Ratten, 2017). Consequently, the innovative products developed through this approach tend to align with current trends and garner support from the community, as they are based on an understanding of Islamic principles.

Based on existing theories and conceptual frameworks, it becomes evident that the integration of Technological Pedagogical Content Knowledge (TPACK) with PjBL can foster students' entrepreneurial interests. Addressing the aforementioned issues, researchers seek to implement project-based TPACK learning (PjBL) as a means to enhance students' entrepreneurial interests, thus addressing the challenges of the 21st century.

The distinguishing factor of this research lies in its focus on integrating two learning models to promote student entrepreneurship. Previous studies, such as those conducted by Haq (2022), solely concentrated on the project-based learning model within the domain of entrepreneurship. Similarly, research by Putri (2022) explored the entrepreneurial abilities and potential of D4 Bachelor of Applied Fashion Design students at Yogyakarta State University's Faculty of Engineering, specifically in terms of promoting and marketing vocational-based products using various online-based digital media. Considering the theoretical and conceptual foundations, the integration of TPACK learning with PjBL demonstrates its potential to increase students' entrepreneurial interests. In light of the significance of this research objective, the study aims to investigate how to empower students in cultivating an interest in entrepreneurship through the following research questions: (1) What is the learning environment of Islamic religious education based on the analysis from the initial survey? (2) How does the interest in student entrepreneurship increase after the application of PjBL integrated with TPACK-based Islamic religious education learning?

2. Method

The present study adopts a mixed methods approach, which involves the integration of quantitative and qualitative methods to comprehensively understand research problems (Creswell & Clark, 2018). This approach combines different methods in order to yield a more comprehensive, valid, reliable, and objective understanding than if each method were used independently (Sugiyono, 2014, p. 404). By employing qualitative research with an observational basis, the researchers aimed to describe the emergence of students' interest in entrepreneurship during learning activities using the PjBL (Problem-based Learning) model with TPACK (Technological Pedagogical and Content Knowledge) in the 21st century context.

The target population for this study comprised all third-semester students enrolled in the Islamic Religious Education program at UIN Sulthan Thaha Saifuddin Jambi. The researchers utilized a total sampling technique, which involved including all available participants in the study (Sugiyono, 2013). In total, 90 students were selected as the sample, as the researchers aimed to capture a comprehensive view of the entire population. It is noteworthy that most of the students voluntarily participated in the research.

Data collection in the quantitative phase of the study involved the use of a questionnaire as the primary instrument. The questionnaire was designed to assess the students' interest in entrepreneurship and their perception of the problem-based learning model integrated with TPACK. Descriptive data analysis techniques were applied using SPSS (Statistical Package for the Social Sciences) software to examine the Technological Pedagogical and Content Knowledge (TPACK) and to perform regression analysis to determine the influence of TPACK and PjBL on students' entrepreneurship interest.

In addition to the questionnaire, the researchers employed interviews as a supplementary data collection method. Interviews were conducted to gain deeper insights into the constraints experienced by students in developing their interest in entrepreneurship. To ensure the validity and reliability of the instruments, expert judgment techniques were employed by the researchers (Creswell & Clark, 2018).

By employing a mixed methods approach and incorporating both quantitative and qualitative data, this study aimed to provide a comprehensive understanding of students' interest in entrepreneurship within the context of problem-based learning integrated with TPACK. The utilization of questionnaires and interviews, along with expert judgment techniques, ensured the collection of robust and reliable data to address the research questions effectively.

3. Result

This study explores the effectiveness of the TPACK integrated PjBL model in supporting students' entrepreneurial ambitions within the context of 21st-century Islamic Religious Education. The research was conducted with 90 third-semester students from the Islamic Religious Education Study Program at UIN Sulthan Thaha Saifuddin Jambi. A descriptive study methodology with a quantitative approach was employed, using total sampling as the sampling method. The data was analyzed through pretest and posttest analysis, including a Kolmogorov-Smirnov normality test. The findings of this research will now be presented.

The analysis focuses on identifying issues faced by students in the Islamic Religious Education course, considering the learning environment and their understanding of TPACK. These results serve as the starting point for the research process, addressing the first problem formulated in this study. Furthermore, this analysis establishes a theoretical framework that underpins the development of an intervention: implementing an integrated TPACK PjBL approach to enhance students' interest in entrepreneurship within the Islamic Religious Education context.

3.1 Learning Environment

The analysis of the learning environment plays a crucial role in identifying and addressing student challenges within the teaching and learning process, particularly in relation to external factors such as the environment. To gather pertinent information concerning the learning environment, the researchers employed the What is Happening in this Class questionnaire? (WIHIC) developed by MacLeod and Fraser (2010). This instrument assesses seven indicators associated with the learning environment in Islamic religious education courses, namely student cohesiveness, teacher support, involvement, order and organization, task orientation, cooperation, and equity.

In this study, a survey was conducted on a sample of 90 students enrolled in semester three (3), specifically focusing on Islamic religious education. The purpose of this survey was to gauge student responses and perceptions of the learning environment using the aforementioned WIHIC instrument (MacLeod & Fraser, 2010). The findings of the survey shed light on several problem areas that necessitate rectification in order to enhance student interest in entrepreneurship.

Among the seven WIHIC indicators mentioned earlier, namely student cohesiveness, teacher support, involvement, order and organization, task orientation, cooperation, and equity, the data revealed that the indicators of teacher support and involvement were the most commonly identified problematic areas. These findings underscore the significance of addressing these specific aspects to create an environment that fosters student engagement and entrepreneurship interest.

By carefully analyzing and understanding the dynamics of the learning environment, educators and policymakers can implement targeted interventions and improvements to enhance the overall learning experience for students in Islamic religious education courses. This comprehensive approach will contribute to a positive and conducive learning atmosphere, where students feel supported, engaged, and motivated to pursue their entrepreneurial aspirations (MacLeod & Fraser, 2010).
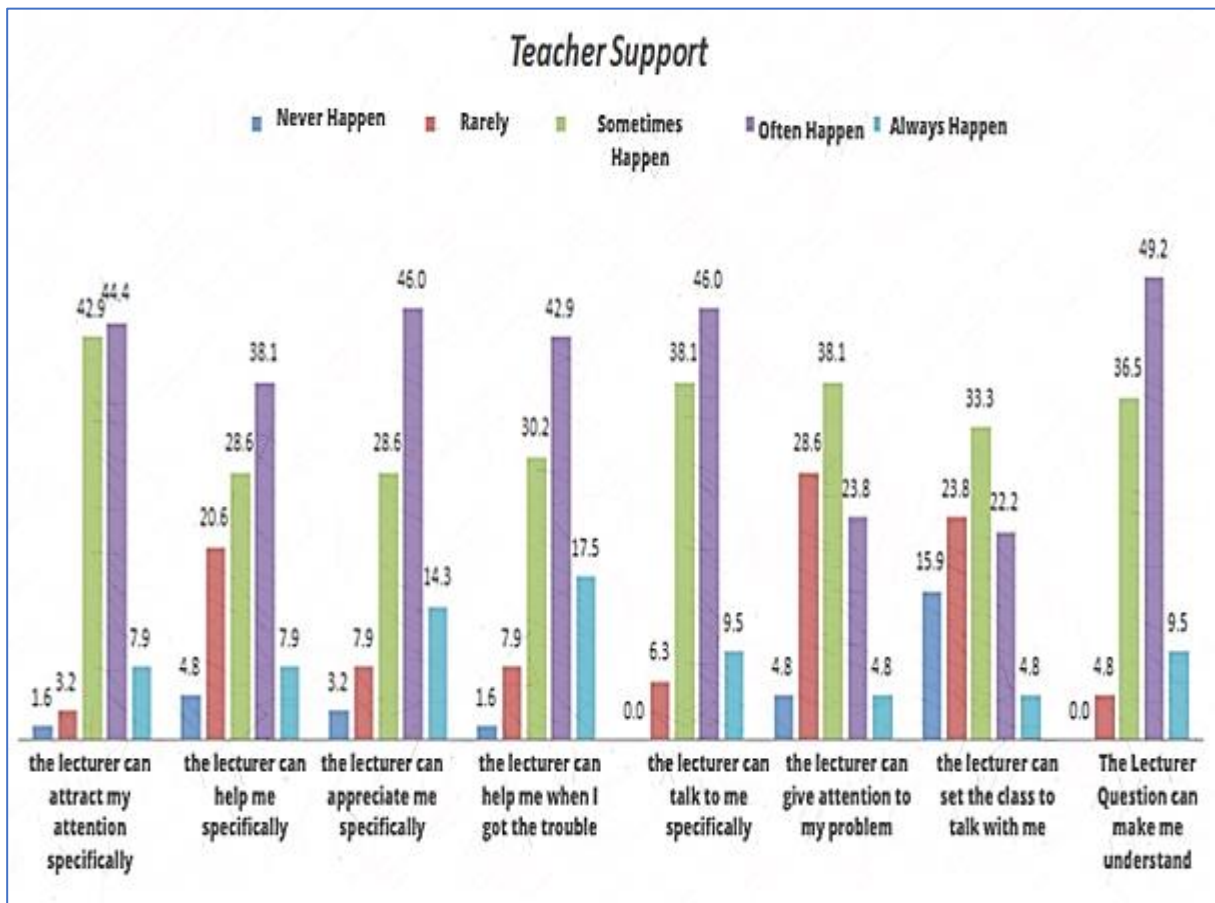

Figure 3.1 *Teacher Support* **Survey Data**

Based on the analysis of the data presented in Figure 3.1, it becomes evident that there are several noteworthy issues that require attention in relation to lecturer support during lectures. The data reveals that a significant proportion of students, specifically 42.9%, feel that lecturers are able to capture their attention in learning only occasionally. Moreover, 20.6% of students indicate that they rarely receive assistance from lecturers, particularly when they encounter difficulties, while 28.6% of students report that they sometimes receive such help under similar circumstances. Furthermore, additional concerns arise from other indicators, with 30.2% of students expressing that lecturers occasionally speak directly to them, and 28.6% of students feeling that lecturers seldom pay attention to or show interest in the issues they are facing.

The data presented in Figure 3.1 also sheds light on another pertinent issue: the inadequate responsiveness of lecturers. Notably, 15.9% of students state that lecturers never arrange or modify classes to address their concerns, and 23.8% of students mention that lecturers rarely make the necessary adjustments to facilitate open communication.

Additionally, Figure 3.2 provides insights into the problem of student involvement in Islamic religious education lectures. The data underscores the need for corrective measures, as it reveals a tendency for students to feel only occasionally engaged in teaching and learning activities. For instance, 44.4% of students indicate that they only occasionally participate in discussions and share their ideas or thoughts during class. Similarly, 42.9% of students report that they only sometimes express their opinions during class discussions. Furthermore, 54% of students feel that their ideas and suggestions are only occasionally incorporated into the discussions, while 17.5% of students believe that their ideas are rarely considered in these academic exchanges (Figure 3.2).

In conclusion, the data analysis demonstrates the presence of significant challenges pertaining to lecturer support and student involvement in academic settings. The findings indicate the need for corrective actions to enhance lecturer responsiveness and promote active engagement among students in both general lectures and specifically in the context of Islamic religious education. Addressing these issues is essential to improve the overall quality of the educational experience and facilitate effective teaching and learning environments (Figure 3.1, Figure 3.2).
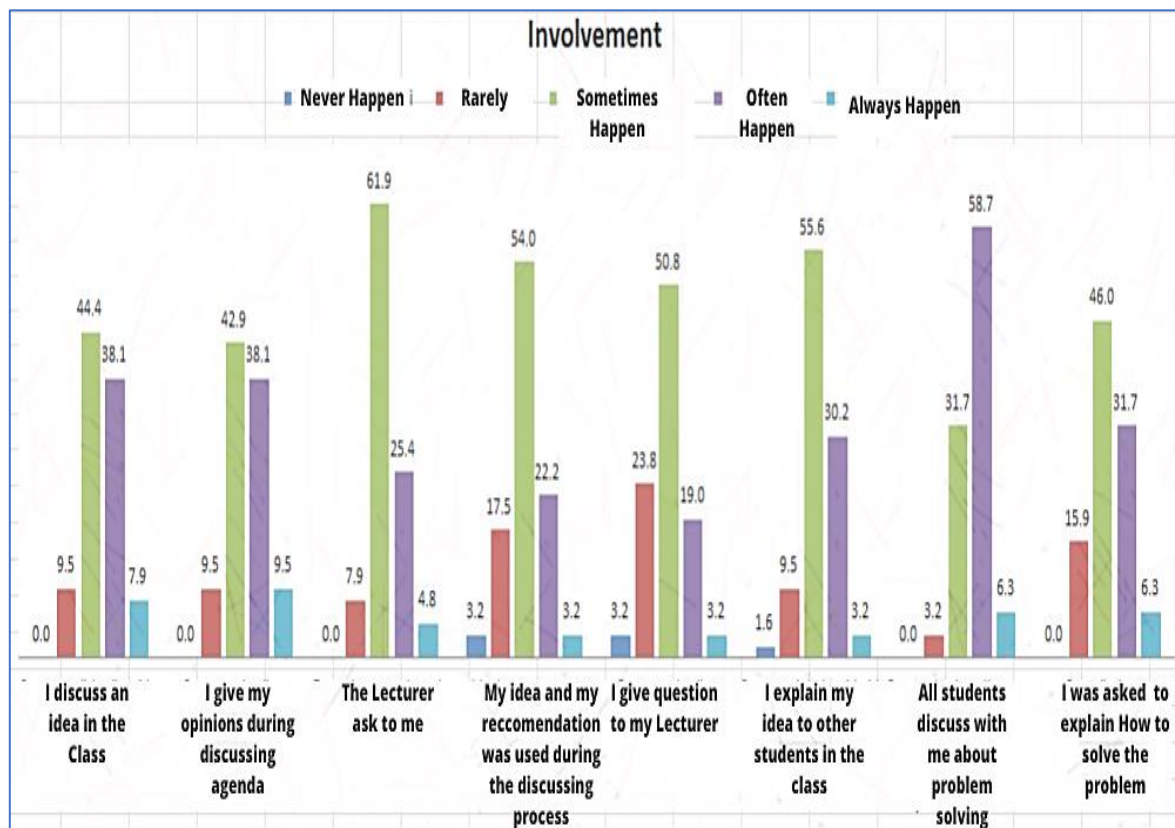

Figure 3.2 Survey of Involvement

a. TPACK Capability Assessment Analysis

Pedagogic competence holds paramount importance for prospective teachers during their learning journey. Technological Pedagogical Content Knowledge (TPACK) represents the interplay between technological, pedagogic, and content knowledge that aspiring teachers must master. The assessment instrument for evaluating TPACK proficiency is employed to provide a comprehensive overview of students' knowledge pertaining to TPACK. The assessment encompasses six indicators, namely Content Knowledge, Pedagogy Knowledge, Pedagogical Content Knowledge, Technological Knowledge, Technology Pedagogy Knowledge, and Technology Content Knowledge, as well as Technology Pedagogy Content Knowledge.

In the context of Islamic religious education, teachers often face challenges in comprehending the specific characteristics of the subject matter, leading to difficulties in selecting appropriate instructional approaches aligned with the content being taught. In relation to the TPACK aspect, both adherents and non-adherents of the program within the Islamic religious education community exhibit similar perceptions, indicating a need for enhanced understanding and application of TPACK in the learning process. The limited familiarity with TPACK implementation contributes to a relatively low level of technology integration knowledge among Islamic religious education teachers. Consequently, concerted efforts should be made to promote continuous knowledge development and facilitate the effective application of technology within educational settings.

Table 3.1 Description of TPACK

Aspects of TPACK	ISLAMIC RELIGIOUS EDUCATION Teacher
Technological knowledge (TK)	80.20
Content knowledge (CK)	82.47
Pedagogical knowledge (PK)	80.80
Pedagogical content knowledge (PCK)	68.10
Technological pedagogical knowledge (TPK)	71.68
Technological content knowledge (TCK)	70.89
Technological pedagogical content knowledge (TPACK)	64.50
Average score	

According to the data presented in Table 3.1, Islamic religious education teachers have varying levels of knowledge in different aspects of TPACK. Content knowledge (CK) and pedagogical knowledge (PK) received relatively high scores of 82.47 and 80.80, respectively. Technological knowledge (TK) also obtained a decent score of 80.20. However, there is room for improvement in other areas. Pedagogical content knowledge (PCK) received a score of 68.10, while technological pedagogical knowledge (TPK) and technological content knowledge (TCK) scored 71.68 and 70.89, respectively. The lowest score was recorded for technological pedagogical content knowledge (TPACK) at 64.50.

These findings indicate that Islamic religious education teachers generally have a good grasp of content and pedagogical knowledge. However, there is a need to enhance their understanding of how to integrate technology effectively into teaching (TPK) and how to apply pedagogical strategies in conjunction with technology (TPACK). This suggests that further professional development and training are necessary to improve teachers' knowledge and implementation of TPACK principles in educational settings.

To enhance the overall TPACK scores, it is crucial to provide targeted training programs that focus on the integration of technology into Islamic religious education. This can involve workshops, seminars, and courses specifically designed to enhance teachers' technological pedagogical content knowledge. Ongoing efforts should be made to update teachers' knowledge and skills, keeping them abreast of the latest technological advancements and effective pedagogical approaches.

By addressing the gaps in TPACK knowledge and promoting its effective implementation, Islamic religious education teachers can leverage technology to create engaging and impactful learning experiences for their students. This, in turn, can contribute to improved educational outcomes and prepare students for the demands of the modern world.

Table 3.2 Descriptive Statistics of Student
Entrepreneurship Interest

Statistics	*Before*	*After*
N	35	35
Mean	38,5	76,9
Skewness	0,83	0,173

Table 3.2 shows the results of improvements to the average score. From the average score, it can be seen that there was an increase in student interest scores after being taught with TPACK-based and integrated PjBL learning from an average score of 38.5 to 76.9. Assessment of student entrepreneurship interest is carried out using an entrepreneurial interest assessment instrument.

To conduct a statistical test, first conduct a prerequisite test of analysis, that is, a normality test. The results of the prerequisite test of analysis using the Kolmogorov-Smirnov normality test against pretest and posttest data are presented in Table 3.2.

Table 3.2 presents the descriptive statistics of student entrepreneurship interest before and after the implementation of TPACK-based and integrated PjBL learning. The table includes the number of observations (N), mean scores, and skewness values for both the before and after conditions. The average score of student interest in entrepreneurship increased significantly after the intervention. Prior to the intervention, the average score was 38.5, whereas after the intervention, the average score rose to 76.9. This substantial increase suggests that the teaching approach had a positive impact on student interest in entrepreneurship.

To assess the normality of the data and ensure the appropriateness of statistical tests, a Kolmogorov-Smirnov normality test was conducted on the pretest and posttest data. Table 3.2 displays the results of this normality test. The significance values obtained were 0.051 and 0.200 for the pretest and posttest data, respectively. Since these values are greater than the alpha value of 0.05, it can be concluded that the data follows a normal distribution.

Furthermore, the skewness values in Table 3.2 indicate that both the pretest and posttest data are normally distributed. The skewness value of 0.83 for the pretest data and 0.173 for the posttest data fall within the range of -1 to 1, which is considered indicative of a normal distribution.

Given the normal distribution of the data, a parametric test, specifically the Islamic religious educated t-test, was chosen to analyze the differences in student entrepreneurship interest. The Islamic religious educated t-test is commonly used for paired samples, making it suitable for comparing the pretest and posttest scores in this study.

In summary, the analysis demonstrates that the implementation of TPACK-based and integrated PjBL learning led to a significant increase in student interest in entrepreneurship. The normality tests indicated that the data was normally distributed, allowing for the application of parametric tests. Further insights can be obtained by examining the results in Table 3.3, which likely includes additional statistical analyses and effect size measures related to the differences in student entrepreneurship interest before and after the intervention. Next, Table 3.3 contains the results of the Islamic religious educated t-test, N-Gain calculations, and effect size. Unfortunately, the information regarding these results is not provided in the given text, so a detailed analysis of Table 3.3 cannot be conducted based on the available information.

Table 3.3. Test Results Different, N-Gain and Effect size

Statistics	Value	Category
T value	12,48	
Asymp. Sig. (2-tailed) (*Islamic religious educationred Sample Test*)	0,000	Significant differences, After learning > Before learning
N-Gain	0,5	keep
Cohen's d-effect size	2,1	Powerful effects

The data presented in Table 3.3 provides insights into the effects of TPACK-based and integrated PjBL (Project-Based Learning) on student entrepreneurship interest. The analysis indicates a significant difference in student entrepreneurship interest before and after implementing this teaching approach. The T value of 12.48 suggests a strong statistical significance with an associated p-value (Asymp. Sig.) of 0.000, indicating that the difference observed in the scores is highly unlikely to occur by chance. According to Morgan et al. (2004), a significance level of less than 0.05

indicates a significant difference between the scores before and after the intervention. In this case, the data suggests that the student entrepreneurship interest increased significantly after being taught using the TPACK-based and integrated PjBL approach. This finding is supported by the T value and the low p-value, indicating a substantial difference in student interest.

Furthermore, the effect size, as measured by Cohen's d, provides an indication of the practical significance or magnitude of the observed difference. A Cohen's d value of 2.1 indicates a powerful effect, suggesting that the implementation of TPACK-based and integrated PjBL learning has a substantial impact on increasing student entrepreneurship interest. This effect size indicates a large and notable difference between the scores before and after the intervention.

However, it is important to note that the magnitude of the N-Gain, as presented in Table 3.3, provides additional information about the extent of the increase in student entrepreneurship interest. The N-Gain value of 0.5 suggests a moderate category of improvement. Although the increase is statistically significant and considered powerful based on Cohen's d, the actual gain in student entrepreneurship interest is still categorized as moderate when considering the N-Gain value. This suggests that while the teaching approach has a notable effect, there is room for further improvement in enhancing student interest in entrepreneurship.

In conclusion, the analysis of the data indicates that the implementation of TPACK-based and integrated PjBL learning has a significant and powerful effect on increasing student entrepreneurship interest. The statistical significance, as evidenced by the T value and p-value, suggests a clear difference between student scores before and after the intervention. Moreover, the effect size, as measured by Cohen's d, indicates a strong practical impact. However, the N-Gain value reveals that the increase in student entrepreneurship interest falls within the moderate category, indicating potential for further enhancement. These findings highlight the effectiveness of the TPACK-based and integrated PjBL approach while also suggesting areas for future research and improvement in fostering student interest in entrepreneurship.

4. Discussion

The data clearly indicates that students often feel only occasionally involved in teaching and learning activities. This is evident from the fact that 44.4% of students reported occasionally discussing ideas in class, while 42.9% felt that they only sometimes had the opportunity to express their opinions during discussions. Additionally, 54% of students felt that the ideas and suggestions they contributed were only occasionally utilized, and a concerning 17.5% of students expressed that their ideas were rarely used during discussions. This also confirms that the

TPACK-integrated PjBL has a positive influence on the interest in entrepreneurship of students of the Islamic religious education study program at UIN Sulthan Thaha Saifuddin Jambi. These findings serve as a foundational basis for further discussion and investigation of the research questions.

4.1 Learning Environment of Islamic Religious Education.

The first research question aims to explore the learning environment of Islamic religious education based on the analysis from the initial survey. The findings provide valuable insights into the challenges and opportunities within this educational context, emphasizing the need for improvements (Patimah et al., 2022; Sutami et al., 2022).

Among the seven WIHIC indicators mentioned earlier, namely student cohesiveness, teacher support, involvement, order and organization, task orientation, cooperation, and equity, the data revealed that the indicators of teacher support and involvement were the most commonly identified problematic areas. These findings underscore the significance of addressing these specific aspects to create an environment that fosters student engagement and entrepreneurship interest.

Moreover, the data reveals that student involvement in teaching and learning activities is often limited. Many students report feeling only occasionally engaged in class discussions and having their ideas heard and utilized. This indicates a pressing need to enhance student involvement and participation within Islamic religious education lectures. By creating a more interactive and participatory learning environment, educators can foster deeper understanding, engagement, and critical thinking skills among students (Dykhne et al., 2021; Okolie, 2022).

Therefore, by carefully analyzing and understanding the dynamics of the learning environment, educators and policymakers can implement targeted interventions and improvements to enhance the overall learning experience for students in Islamic religious education courses. This comprehensive approach will contribute to a positive and conducive learning atmosphere, where students feel supported, engaged, and motivated to pursue their entrepreneurial aspirations (MacLeod & Fraser, 2010).

The current teaching methods employed in the 2013 curriculum heavily emphasize memorization, which limits students' ability to apply their knowledge (Prihantoro, 2005; Wahyudin, 2015; Gunawan, 2017). However, Islamic religious education possesses the potential to offer more than mere rote memorization and theoretical understanding. It can provide students with opportunities to creatively apply their religious knowledge, such as through the creation of products that adhere to Islamic law (Iqbal, 2020; Asari, 2020; Aisida, 2021). To facilitate this, the implementation of

a suitable model that promotes higher-order thinking becomes imperative. One recommended approach that encourages hands-on, practical projects is Project-Based Learning (PBL) (Wulandari, 2021; Junaidi, 2022; Keleman, 2021).

Furthermore, the study sheds light on the challenges faced by Islamic religious education teachers. Many teachers struggle to comprehend the characteristics of the material and encounter difficulties in selecting appropriate learning approaches (Joyce, 1986; Wahyuningsih et al., 2021; Luik, 2010). In terms of Technological Pedagogical Content Knowledge (TPACK), there is a clear need for teachers to enhance their knowledge and application of technology within the learning process (Author8, 20XX). Addressing these challenges requires continuous professional development efforts to bolster teachers' competence in integrating technology effectively.

4.2 Increasing Interest in Student Entrepreneurship

The second research question in this study explores the influence of PjBL integrated with TPACK-based Islamic religious education learning on student entrepreneurship interest. The findings of this study present compelling evidence of a significant increase in student entrepreneurship interest as a result of implementing this approach.

The second research question of this study aimed to delve into the factors influencing student entrepreneurship interest, specifically focusing on the application of Project-based Learning (PjBL) integrated with Technological Pedagogical Content Knowledge (TPACK)-based Islamic religious education. By examining the effects of this approach, the study sought to provide a comprehensive understanding of how it contributes to the development of entrepreneurial interest among students.

The findings of the study revealed a significant increase in student entrepreneurship interest following the implementation of PjBL integrated with TPACK in the Islamic religious education program at UIN Sulthan Thaha Saifuddin Jambi. This outcome highlights the positive impact of integrating TPACK and PjBL on students' inclination towards entrepreneurship. These results align with existing theoretical foundations that emphasize the significance of exploring and nurturing students' entrepreneurial interests (Loi et al., 2016; Baptista et al., 2015; Pittaway & Cope, 2007).

In today's dynamic global landscape, fostering entrepreneurship not only plays a crucial role in reducing the unemployment rate but also serves as a catalyst for innovation and the creation of new job opportunities. Therefore, the positive influence of PjBL integrated with TPACK on student entrepreneurship interest holds immense value, as it contributes not only to the personal growth and development of students but also to the economic progress of the region. UIN Sulthan Thaha Saifuddin Jambi, renowned for its commitment to providing quality education, has incorporated dedicated entrepreneurship courses within its study program. The institution's vision and mission, guided by a well-designed framework, prioritize entrepreneurial resource-based business management, positioning UIN Sulthan Thaha Saifuddin Jambi as a reference in the field of entrepreneurship development (Nurhayati, 2018). The integration of PjBL and TPACK within this educational institution further strengthens its reputation for fostering entrepreneurial skills among students.

Entrepreneurial interest, as observed in this study, can be characterized as an intrinsic motivation that drives individuals to work diligently and take risks in starting and managing a business (Purwana & Suhud, 2018; Ritonga et al., 2022; Triyani et al., 2021). It is imperative to encourage active participation and cultivate entrepreneurial interest among students, as it empowers them to take control of their own lives and reduces dependence on external factors (Suharti, 2011; Ritonga et al., 2022; Triyani et al., 2021). By nurturing this interest, educational institutions can equip students with the necessary skills and mindset to embark on entrepreneurial endeavors.

The findings of this study underscore the significant role of higher education institutions in equipping students with the essential competencies for entrepreneurship. While cognitive knowledge and technical expertise form the foundation of hard skills, the development of soft skills, such as problem-solving and collaboration, is equally vital for students' holistic growth. Striking a balance between these hard and soft skills ensures that graduates possess the required competencies to navigate the complexities of the entrepreneurial landscape successfully. In conclusion, this research provides valuable insights into the learning environment of Islamic religious education and the impact of integrating PjBL with TPACK on student entrepreneurship interest. The study emphasizes the need to enhance student involvement, improve teachers' understanding of the material, effectively integrate technology, and foster entrepreneurial interest as key areas of focus for educational stakeholders. By embracing innovative approaches like PjBL and TPACK integration, Islamic religious education can better prepare students for future challenges and opportunities in entrepreneurship and beyond. Ultimately, these efforts contribute to the overall growth and prosperity of individuals, communities, and society as a whole.

5. Conclusions

The design of the 21st Century Learning Approach with the TPACK Integrated PJBL Model has emerged as a valuable framework for promoting entrepreneurship skills among students. This study has

identified significant differences in knowledge and perception of TPACK integration in learning between PAI teachers who participated in the program and those who did not, indicating a need for further development in increasing their technological competence. Additionally, positive influences on students' interest in entrepreneurship have been observed within the Islamic Religious Education study program at UIN Sulthan Thaha Saifuddin Jambi. However, to strengthen these findings, future research should focus on evaluating the process of empowering student entrepreneurship interest through the TPACK-integrated PjBL model, improving measurement instruments and data analysis, and conducting more rigorous experimental reviews to determine the direct impact of the model. Addressing the competence of lecturers implementing the PjBL-TPACK model and ensuring comprehensive, researchable, and observable performance references are essential for successful implementation. Overall, this study contributes to the field by highlighting the gaps in knowledge among PAI teachers, identifying the positive effects on student interest in entrepreneurship, and emphasizing the need for further research to advance the understanding and implementation of effective instructional approaches.

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