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RADEC Model: A Solution to Train Students' Collaborative Skills in Learning Islamic Education

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Abstract

Study this aims to analyze the influence of the RADEC learning model on skills collaboration among students in the Islamic Religious Education lecture. The research method used is quantitative with a pre-experimental design one-group pretest-posttest type. A subject study involving eight selected students used a total sampling technique. Data was collected through test skills collaboration before and after the intervention, as well as analyzed using the normality test, paired t-test, and N-Gain test. The results of the study show significant improvement in skills collaboration among students. Paired t-test produces p value = 0.005, which indicates an important difference between pretest and posttest scores. N-Gain analysis shows an average increase of 73.93%, suggesting the effectiveness of the RADEC model in increasing skills collaboration. The RADEC stages, which involve activity reading, answering, discussing, explaining, and creating work, have proven to push work equality, communication, and responsibility to answer collectively among students. Research this confirms that the RADEC learning model is effective in developing skills for collaboration among students in the eyes of Islamic Religious Education lectures. Findings This contribution is important for the development of learning strategies relevant to innovative with need skills 21st century, especially in the context of Islamic Religious Education.

INTRODUCTION

In the middle development globalization and revolution industry 4.0, needs will skills the 21st century is increasingly stand out as the foundation the main thing to do owned by generation For survive and succeed in the world of work as well as dynamic society (Rahayu et al., 2022). Skills in this 21st century are summarized in the 4C concept, which includes Critical Thinking, Collaboration, Communication, and Creativity (Tari & Rosana, 2019; van Laar et al., 2017; Wulandari, 2021). Of the four skills, the ability to collaborate own role is important because it describes the capacity of the individual For Work.

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The same in the group, share not quite enough answers, solve problems in a way collectively, and achieve objectives together in an effective way (Rosnaeni, 2021; Wulansari & Sunarya, 2023).

Collaboration skills are one of the skills that are highly needed in the modern era, where the dynamics of work and professional life are increasingly complex. In various fields, such as technology, health, business, and education, the ability to work in a solid team is a determinant of success. Effective teams are able to produce innovation through the synergy of ideas, solve complex problems with a multidisciplinary approach, and respond to global needs with high efficiency and adaptability (Handayani et al., 2023; Suyitno et al., 2021). In this context, collaboration is not just about sharing tasks but also involves effective communication, the ability to understand other people's perspectives, and a shared commitment to achieving collective goals (Mitra & Purnawarman, 2019). On the other hand, higher education institutions, which are responsible for producing competent graduates who are ready to face the challenges of the world of work, face major challenges in building students' collaboration skills. One of the obstacles is the learning approach that still predominantly uses conventional methods, such as one-way lectures. This method, although effective for knowledge transfer, does not provide enough space for students to interact actively or engage in specifically designed collaborative activities (Ayun, 2021). As a result, students are not sufficiently exposed to situations that require them to work in teams, share responsibilities, or solve problems together.

Furthermore, effective collaborative learning requires careful planning. This includes designing activities that allow students to actively participate, clear instructions regarding the roles of each team member, and guidance from lecturers to ensure the collaboration process runs smoothly (Pramudita et al., 2021). Unfortunately, many higher education institutions have not fully adopted this strategy, so the opportunity to develop students' collaboration skills has not been optimally utilized. Higher education as an institution tasked with producing competent young people who are ready to face future challenges, it is not enough to only provide knowledge transfer, but also equip students with collaboration skills (Alexander et al., 2020; Rosnaeni, 2021; Seman et al., 2018). Unfortunately, the approach learning that is applied in many colleges Still tends nature conventional, with the method of lecture as the approach main (Khunaifi & Matlani, 2019; Muhammedi, 2016). This method is often too lecturer-centered and does not provide enough space for students to be involved and active, especially in participating in activities that are collaboratively designed in a special way (Rahayu et al., 2022; Suardi, 2024).

In the context eye Islamic Religious Education lectures, which have the objective main for to form character and instilling values religious to students, opportunities for developing skills of collaboration are actually very big (Haryati et al., 2023). This is because Islamic Religious Education not only discusses aspects of religious knowledge but also focuses on the formation of morals and attitudes Work the same as being the essence of education Islamic character (Abdiyantoro et al., 2024; Rusadi et al., 2019; Yemmardotillah et al., 2024). However, the practice of learning Islamic Religious Education still faces obstacles, where the lecture approach still dominates and collaborative activities have not been optimized.

One of the approaches that can answer the challenge is a RADEC (Read, Answer, Discuss, Explain, and Create) learning model designed to push students involved active in the learning process through five stages (Handayani et al., 2019; Sopandi et al., 2021; Sopandi, 2019). Stages First, Read, requires students to read and understand the material provided. Stage Answer challenge: they

answer questions based on understanding the material. Stage Discuss gives a chance to discuss in groups, exchange ideas, and complete the problem in a way together. Stage Explain practice student for explain return understanding they verbally, while stage lastly, Create, push they for create results creative learning based on understanding and discussion that has been done. From the five stages, especially at this stage, Discuss and Create, the RADEC model is very relevant for development skills collaboration. Students are invited to work in the same way active, listening to view colleagues, giving contributions, and producing solutions or product learning in a collective way (Anggraeni et al., 2021; Iwanda et al., 2022).

The Gentleman (2017) explains that the RADEC model is effective in increasing various skills 21st century, such as thinking, creativity, and communication. Then Fauziyati, (2023) also revealed that the RADEC model could also be implemented at the organizational level student for practice skills students with stages implementation of the RADEC model, which has direction for practice students for active and creative. However, research that is special to studying the impact of skills collaboration, especially in the context eye Islamic Religious Education lectures, is still very limited. The gap study is what it is based on the survey. Research this aims to fill in the emptiness by analyzing the influence application of the RADEC model on skills collaboration among students in the eyes of Islamic Religious Education lecture. Research results. This expectation can contribute important in the development methods of more innovative and relevant need generation, especially in the context of education in Indonesia. Thus, research not only focuses on the influence of the RADEC model on skills collaboration but also on how this approach can integrated in a way effective to eye Islamic Religious Education lectures to support the formation of character and competence students in a holistic way.

METHODS

In analyzing a study, an approach is needed that is by the objectives of the study, namely measuring and analyzing the impact of using the RADEC learning model on students' collaboration skills, so this study uses a quantitative approach with a pre-experimental one-group pretest-posttest experimental design method (Damri et al., 2017; Engkizar et al., 2024; Takona, 2024). Then the population in this study were students who took Islamic Religious Education courses at the Faculty of Mathematics and Natural Sciences Education, Universitas Pendidikan Indonesia, and the sample in this study was taken using a purposive sampling technique, so the sample taken from one class was 34 people (Mubarok & Kharisma, 2022; Pratama et al., 2020). The data collection used a research instrument in the form of an assessment rubric that measures collaboration skills based on indicators, such as communication in teams, division of tasks, joint decision-making, and problem-solving skills (Adewumi et al., 2019). The research procedure begins with giving a pretest to measure students' collaboration skills before implementing the RADEC model, as symbolized that the pretest is O1. Furthermore, the application of the RADEC model in the learning process for five meetings as a treatment symbolized by X. After the treatment is given, it is continued with a posttest to measure changes in the results of the application of the RADEC model on students' collaboration skills symbolized as O2. To be clearer, it will be described in the following table:

Table 1. Research Design

Pretest	Treatment	Posttest
O^1	X	O^2

Furthermore, after the data was collected, the research was analyzed using SPSS 27.0 software, descriptively analyzed to describe the average improvement of collaboration skills, and statistical tests using normality tests, paired sample t-tests, and N-Gain tests were used. For testing, the extent of the significance of the influence of the RADEC model (Anggraeni et al., 2021).

RESULT AND DISCUSSION

Ability collaboration is one of the skills very important 21st century developed in students. Based on the results of this study, the evaluation of ability collaboration was done through three main analysis findings, namely the normality test, the Paired T-Test, and the N-Gain analysis. Studies show that the learning model applied has an impact significant to the improvement ability to collaborate among students. Thus, research this is also analyzed with normality test as follows:

Table 1Normality Test Results

Description	Test Statistic	Asymp. Sig. (2-tailed)
Collaborative Skills	.204	.200[c,d]

Normality test results using The One-Sample Kolmogorov-Smirnov method show that the average residual is 0.0000000 with a standard deviation is 0.71265570. This value indicates that error or residue is spread evenly without significant bias. The difference absolute maximum of 0.204 means the existence of A little deviation from a normal distribution, but deviation Still is within reasonable limits. With Asymp. Sig. (2-tailed) value of 0.200, which is bigger than the significance threshold of 0.05, hypothesis zero that the residual data follows normal distribution no can rejected. This is indicates that the data used is valid for continue to stage analysis next. Next analyzed with the Paired T-Test, as follows:

Table 2Paired T-Test Results

Description	Collaborative Skills
Mean	-8.50000
Std. Deviation	6.02376
Std. Eror Mean	2.12972
Lower	-13.53599
Upper	-3.46401
t	-3.991
Sig. (2-tailed)	.005

Analysis of pretest and posttest data using the Paired T-test shows the existence of significant differences before and after treatment given. The average value of the difference of -8.50000 indicates the existence of a substantial increase in the posttest score compared to the pretest. The t value is -3.991 with a significance (p) of 0.005, which is far smaller than 0.05, strengthens the conclusion that the difference This significant in a way, statistics. The 95% confidence interval ranges from between -13.53599 to -3.46401; neither covers zero, so the results show that observed differences No is results by chance. Thus, the interventions implemented are effective in increasing the ability to collaborate among students. In addition, N -Gain test

analysis was also carried out for know improvement ability collaboration from pretest, treatment, and posttest done, as follows:

Table 3N-Gain Analysis Test

Description	Minimum	Maximum	Mean	Std. Deviation
Score	.50	.94	.7393	.14531
Persen	50.00	94.12	73.9266	14.53088

The results of the N-Gain analysis provide description more Details about level improvement ability collaboration. The average N-Gain score (N-Gain skor) of 0.7393 indicates quite an improvement in scale normalization. Meanwhile, the average percentage of improvement (N-Gain percent) of 73.9266% shows that most students experienced an improvement of more than 50%, although it has not reached 100%. Standard deviation: For scores, 0.14531 shows low variation, indicating that the data is relatively consistent around the mean. In contrast, the standard deviation of the percent N-Gain of 14.53088% shows more variation in the achievement of percentage improvement. The range of scores between 0.50 and 0.94 and the range of N-Gain percentages between 50.00% and 94.12% indicate that all participants experienced improvement, with the majority being in the moderate to high category. However, the practice of learning Islamic Religious Education still faces obstacles, where the lecture approach still dominates and collaboration activities are not optimal. This reflects the effectiveness of the interventions implemented, which are capable of increasing ability collaboration in a way significant in part to big students.

The results of the study showed that the implementation of the RADEC (Read, Answer, Discuss, Explain, and Create) learning model significantly improved students' collaboration skills. This finding is supported by the Paired T-Test statistical test, which showed a significant difference between the results before and after the intervention. In addition, the N-Gain analysis showed that most students experienced increased collaboration skills in the moderate to high category. This indicates that the RADEC model effectively encourages students to work together actively in a conducive learning atmosphere.

First, the RADEC (Read, Answer, Discuss, Explain, and Create) model is designed based on the principle of constructivism, which emphasizes the importance of active learning experiences to build understanding independently. In this context, collaboration-based learning is at the core of the model's implementation. The RADEC model facilitates a learning process in which students not only passively receive information but are also actively involved in various activities that support the development of collaboration skills. One of the key elements in the RADEC model is group discussion. Students are invited to share ideas, exchange opinions, and solve problems at this stage. This activity allows students to appreciate other people's perspectives, listen attentively, and provide constructive input. Through this process, students improve their collaboration skills and hone their critical thinking skills, such as analyzing information and evaluating arguments (Iwanda et al., 2022; Putri et al., 2024; Sari et al., 2022).

In addition, collective task completion in the RADEC model allows students to practice interpersonal skills, such as conflict management, role-sharing, and decision-making. These skills are highly relevant for 21st-century learning, where collaboration is one of the core competencies needed to face global challenges. With an active and participatory approach such as that

offered by the RADEC model, students gain a deep understanding of the material and are trained to work effectively in teams. This prepares them to face the dynamics of the world of work and society that are increasingly complex and collaborative. This model, therefore, contributes significantly to building a generation of learners who can adapt to the needs of the 21st century (Nuha et al., 2024; Rahayu et al., 2022).

Second, relevance of collaboration to the modern work world. The relevance of collaboration skills to the modern work world is increasingly prominent, especially in the era of globalization full of challenges and dynamics (Alfarikh et al., 2021; Rahmi et al., 2021). This study emphasizes that the ability to collaborate effectively is one of the main factors determining the success of individuals and organizations in facing the increasingly complex world of work. Amid global competition, the ability to work in a solid team is not only an option but has become a significant indicator of professional success. Effective collaboration creates opportunities for innovation because diverse teams can contribute unique perspectives and creative solutions to various challenges. In a world of work complete with complex problems, such as technological change, environmental issues, and global market needs, collaborative skills allow team members to integrate their expertise, share responsibilities, and formulate strategies responsive to these needs (Tulljanah & Amini, 2021).

In addition, collaboration is not only limited to sharing tasks but also involves effective communication, empathy, and strong interpersonal skills. Teams that can work well together tend to be more resilient in the face of pressure, faster in resolving conflicts, and more adaptive to change. In the long term, this collaboration supports the organization's sustainability, especially in responding to the needs of the ever-changing global market. In this era of globalization, where the workplace is cross-cultural and involves virtual collaboration, collaboration skills are becoming increasingly crucial. Digital technology allows individuals worldwide to work together in real-time. This requires understanding cultural differences, utilizing communication technologies, and working efficiently in virtual teams. Therefore, collaboration skills are not only relevant but also essential to achieving success in the modern workplace. Organizations that foster a collaborative culture will excel in generating innovation, solving complex problems, and meeting increasingly dynamic global needs (Rosnaeni, 2021).

Third, variation in results and influencing factors. Although the study's overall results indicate that the RADEC model is efficacious in improving students' collaboration skills, there is significant variation in its level of success. This can be seen from the relatively large standard deviation in the N-Gain values, which reflects differences in students' abilities in utilizing this learning model. This variation indicates that although the RADEC model has a positive impact in general, its success is influenced by several factors, both internal and external. The factors that influence it are: (1) Students' Initial Ability before Intervention, one main factor influencing the results is the students' initial ability before implementing the RADEC model. Students with higher levels of initial ability tend to adapt more quickly to learning activities that require collaboration, such as group discussions or collective task completion. Conversely, students with lower initial ability may take longer to understand basic concepts or contribute effectively to a team. This affects how much improvement in skills they achieve during the learning process; (2) Level of Participation in Learning Activities, the second factor is the level of student participation in learning activities. The RADEC model is designed to encourage active student engagement. However, its effectiveness depends

mainly on how much students participate in each stage, such as reading, answering questions, discussing, explaining, and creating solutions. Students who are more actively involved tend to show more significant improvements in collaboration skills than those who are less involved; (3) External Factors, such as learning environment support, motivation, and group dynamics, also play an important role. A supportive learning environment in terms of facilities and a conducive atmosphere can strengthen the effectiveness of collaboration-based learning. Student intrinsic and extrinsic motivation also influence how much they are encouraged to contribute to collaborative activities. In addition, group dynamics, such as interpersonal relationships between team members, fair division of tasks, and the ability to resolve conflicts, are determining factors in the success of collaborative learning (Jufriadi et al., 2022; Mitra & Purnawarman, 2019).

Fourth, theoretical and practical contributions. This study provides significant contributions in theoretical and practical areas of learning. This contribution underlines the importance of the constructivist approach and its application in developing 21st-century skills, especially collaboration. In the theoretical realm, the results of this study support the constructivist approach as the basis for collaboration-based learning. This approach emphasizes that learning is not a passive process in which students only receive information but rather an active process that involves building knowledge through social interaction. In this context, the RADEC (Read, Answer, Discuss, Explain, and Create) model is concrete evidence of how the principles of constructivism can be implemented effectively (Irhamni & Ashari, 2023; Wulandari, 2021).

Through the RADEC model, students are invited to engage in various learning activities that require active participation, such as group discussions, problem-solving, and sharing ideas. This process enriches students' knowledge and trains social skills that support collaborative learning. Thus, this study strengthens the theory that social interaction-based learning can improve students' understanding of concepts and skills more deeply, especially in facing the challenges of the 21st century. From a practical perspective, this study offers valuable guidance for educators to integrate the RADEC model into learning design. This model provides a clear and structured framework for educators to create activities that support the development of 21st-century skills, especially collaboration (Sinaga, 2023; Sternberg, 2017). By implementing the RADEC model, educators can encourage students to work effectively in teams, share responsibilities, and solve problems together. This model also helps educators design learning that is more dynamic and relevant to the needs of the times, such as the use of technology in group discussions or creative collection of learning outcomes. This provides a practical solution to overcome the challenges in improving students' collaboration skills, which are one of the core competencies in the modern world of work and life (Adewumi et al., 2019).

In addition, the RADEC model can be adapted in various educational contexts, from elementary to higher education and in various subjects. With its flexibility, educators can adjust RADEC activities according to student characteristics and learning needs. This study's theoretical and practical contributions not only enrich academic insights on constructivism-based learning but also provide practical guidance for educators to support the development of students' collaboration skills. In the long term, integrating the RADEC model into learning will create a better-prepared generation to face global challenges with solid 21st-century skills (Widodo & Wardani, 2020; Wulandari, 2021).

CONCLUSION

Based on the results study, this discloses that the application of the RADEC learning model (Read, Answer, Discuss, Explain, Create) in the subject of Islamic Religious Education lectures has a significant influence in increasing skills collaboration among students. Results of the analysis show that the RADEC model (Read, Answer, Discuss, Explain, Create) is systematically capable of pushing interaction between students, building Work, the same team, and creating an atmosphere of supportive learning development skills. From the results of statistical tests, there was found existence a difference in significance between marks before (pretest) and after (posttest) treatment. This is proven by an average increase in skills collaboration that achieves more than 73%, based on N-Gain test results. In addition, the analysis Paired Samples Test shows mark low significance ($p < 0.05$), which confirms the impact positive RADEC model (Read, Answer, Discuss, Explain, Create) in repairing ability collaboration among students. In general, overall, research proves that the RADEC (Read, Answer, Discuss, Explain, and Create) model can become an effective learning strategy for increased skills collaboration, especially in context learning Islamic Religious Education. Thus, the application of the RADEC model (Read, Answer, Discuss, Explain, Create) can made into alternative relevant learning for developing skills 21st century, especially in to form of capable students' Work. The same, in a way, is productive in various situations, academic and also professional.

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