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The Development of Kahoot-Based Learning Media Cooperative Learning to Improve Learning Motivation

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Abstract

This study aims to develop learning media based on Kahoot! in cooperative learning to increase the learning motivation of Islamic Religious Education students. The 4D research design, which consisted of defining, designing, developing, and disseminating, was chosen to produce Kahoot! based media. Data were collected using observation sheets and questionnaires. The data was then analyzed using descriptive statistics. It was concluded that learning media based on Kahoot! suitable for use in cooperative learning and can increase student learning motivation. This is evidenced by the results of the media expert test with very good criteria or 93%, the material expert test with good criteria, or 88%, the field test with very good criteria, or 95%, and the learning motivation test with very high and effective criteria. Media Kahoot! as a quiz helps the implementation of cooperative learning with design and game elements relevant to the main principles of cooperative learning such as collaboration, student engagement, active learning, and appreciation. The availability of supporting facilities such as loudspeakers, projector screens, and the Internet has an important role in using Kahoot! media. because it is quite influential on the students' psychological atmosphere and the fluency of cooperative learning

Keywords: kahoot; learning media; motivation

1. Introduction

Entering the middle of the 21st century, learning is being transformed to find its best form amid changes and challenges full of uncertainty. 21st-century learning is based on students as learning centers, collaborative learning, contextual learning, and schools integrated with the community environment (Rahayu et al., 2022). 21st-century skills are no longer sufficient to rely only on C4 (Communication, Collaboration, Critical Thinking, Creativity), but must be supported by other interpersonal skills C2 (Character, Citizenship) (Anugerahwati, 2019). C2 is intended to prepare students as citizens of the world who are cultured, nation, and state and uphold human values. This

paradigm shift encourages educators to be more skilled at planning lessons in achieving the expected competencies, particularly about the learning methods, strategies, and models. Many learning models are recommended by experts in addressing 21st-century learning, one of which is cooperative learning (Octavia, 2020).

The cooperative learning model emphasizes cooperation to achieve common goals. Lie describes it as a learning system that allows students to exchange ideas, and help each other in achieving individual and group success through an educator role (Wena, 2009). This model is heavily influenced by learning theory which argues that learning will be more meaningful if it involves aspects of interaction and communication between students to solve problems. This learning model was initiated by Slavin (1982) and several colleagues at Johns Hopkins University. They argue the cooperative attitude of one for all and all for one will affect one's success which on the other hand helps the success of others as well. Cooperative learning aims to achieve learning outcomes by developing social skills, collaboration, and empowering study groups (Haryati, 2017). The main principles of this model are common goals, positive dependence, division of responsibilities, collective judgment, a combination of cooperative and competitive elements, and the creation of fantasy situations (Sulaiman, 2014). The success of its implementation depends very much on how an educator designs and organizes learning activities because negative interdependence may occur in small groups.

Kahoot is a platform that can help educators to organize cooperative learning. This platform is very popular and widely used in universities to change the learning atmosphere to be more fun and challenging (Yürük, 2019). Kahoot is an online application that can create a fun, challenging, and involving learning atmosphere because it contains elements of gamification that affect the psychological aspects of students (Martins et al., 2019). The features are very user-friendly for beginners who want to bring the learning atmosphere into games such as quizzes, surveys, and group work. Game elements include points, scoreboards, player avatars, timers, background music, and championship podiums (Zhang & Yu, 2021). The application, the result of a collaboration between The British Company and Mobitroll, Norwegian University in 2013, is grouped in the Student Response System (SRS) because of its ability to provide instant feedback (Anatomía, 2018). Kahoot has more than 70 million active users worldwide and can be accessed free of charge through various internet-connected devices such as laptops, computers, smartphones, and tablets (Lunden, 2018). Kahoot has two types of websites namely kahoot.com which is used by lecturers to design learning activities and

www.kahoot.id which is used for students to engage in learning games. Guardia recommend Kahoot as a learning outcome assessment tool because of its ability to provide meaningful learning experiences. In addition, it can be used to increase student learning motivation (Yürük, 2019; Guardia et al, 2019)

Learning motivation is an important factor in achieving student learning outcomes. Motivation is manifested in the form of desire, attention, encouragement, and desire which functions as a driving force for a person's attitude and behavior. Motivation influences fulfilling the needs and hopes that a person has for success in achieving desires (Dimyati & Mudjiono, 2015). Learning motivation is divided into two, namely intrinsic motivation coming from within such as desires, ideals, and goals, and extrinsic motivation coming from outside the students themselves such as schools, lecturers, social environment, and experiences (Hamalik, 2008). Motivation to learn can be seen from the desire of students to succeed, and achieve goals in the future, as well as the existence of rewards in the learning process, interesting learning activities, and a conducive learning environment (Uno, 2008). Learning motivation has a determination of learning outcomes (Andriani & Rasto, 2019). The higher the student's motivation, the greater the chance for success in learning activities (Nurmala et al., 2014). Many studies have examined the effect of learning motivation on other variables, where most of the results prove that motivation has a positive correlation with learning outcomes (Pratama et al., 2019; Pristiyono et al., 2021; Romadhoni et al., 2019).

The implementation of the cooperative learning model itself reaps many benefits, especially in learning motivation. Rohyami's research revealed that cooperative learning can increase motivation, enthusiasm, cooperation, student activity, and student interest in learning after the t-test is carried out with an average rating of 4.4 (scale of 1 -5) (Rohyami, 2019). The same thing was also obtained after a comparative test of the control group that applied the conventional model and the experimental group that applied the Think Pair Share (TPS) cooperative learning model with a higher posttest average score in the experimental group (Kamil et al., 2021). Research on other types, such as Make A Match, also has a positive impact on learning motivation, 90.91% (experimental class) compared to 57.14 (control class) with an average difference in learning outcomes of 16.87 higher than the experimental class (Anggraeni et al., 2019). Donkin say that in several countries stated that most students had positive perceptions of Kahoot regarding learning motivation, performance, and learning atmosphere (Rasmussen 2021). Furthermore, Wang reviewed 93 articles related to Kahoot, of which around

97% of the articles revealed the success of the application in improving learning performance, the rest said there was no impact provided by Kahoot (Wang, 2020). Experiments have also been carried out on class X MAN 4 Kebumen, where their posttest average scores were higher when using the Kahoot application in learning Arabic (Utami & Hamdun, 2020). Class X students of Yogyakarta Cooperative Vocational School also get similar benefits because learning motivation has increased by 9.22%, and learning outcomes by 27.13% after using Kahoot (Wardana & Sagoro, 2019).

Based on the researcher's initial observations, learning of the instructional design course of the Islamic Religious Education (PAI) study program at the Manado State Islamic Institute (IAIN) has so far applied the conventional cooperative learning model. Learning activities are designed and organized using makeshift devices and resources, without any innovation in supporting elements that increasingly lead students to an atmosphere of collaboration and real play. The absence of positive interdependence moving students to contribute more deeply. Researchers try to add one thing to the element of learning media namely Kahoot and then see the impact on the learning motivation variable. The type of cooperative learning studied is the Game Tournament Team (TGT). Therefore this study aims to develop Kahoot -based learning media in TGT-type cooperative learning so that student learning motivation increases.

2. Method

This study uses a 4D development research design (Define, Design, Develop, and Disseminate) made by Thiagarajan (Maydiantoro, 2020). In the first stage, researchers conduct analysis and identification of learning problems and formulate learning objectives. In the second stage, researchers compile instruments and product frames. In the third stage, researchers developed Kahoot -based quizzes and test their feasibility and impact on student motivation. In the final stage, researchers disseminate research results in the form of concepts and development products.

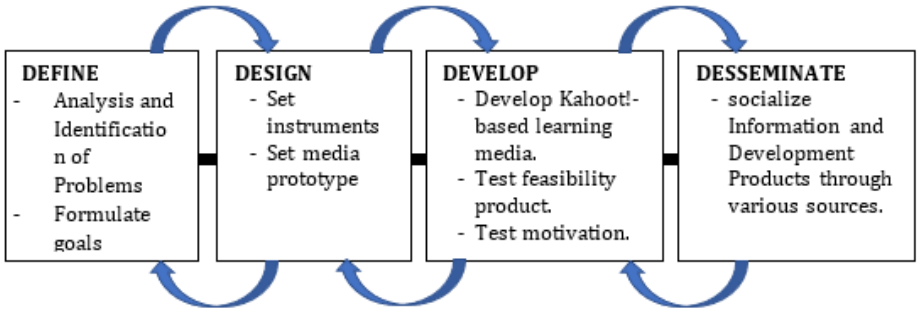

Figure 1. 4D Development Model Adaptation Thiagarajan

Questionnaires are used to test the feasibility of learning media, to determine the level of student learning motivation. The due diligence questionnaire includes a questionnaire to test the validity of media experts, material experts, and field tests. The research will be carried out in two classes, namely Class PAI (Islamic Religious Education) 6A with a total of 33 people, and PAI 6B with a total of 33 people. Product development will be implemented in both classes to see its impact on student learning motivation, whether it is consistent or not.

Table 1. Learning Motivation Questionnaire Grids

No	Indicators	Distribution of Statement Items	Total
1	Attention	1,6,11	3
2	Struggle	2,7,12	3
3	Responsibility	3,8,13	3
4	Students Reaction	4,9,14	3
5	Pleasure and Satisfaction	5,10,15	3
	Statements		**15**

Questionaire data were then analyzed using descriptive statistics through the presentation search formula.

$$P = \frac{f}{N} x\ 100\ \%$$

Figure 2. Memunculkan Style dalam Template

Remarks:

P = Presentase
f = Number of Parts

N = Total Number

The results of the calculations are then included in the media feasibility assessment criteria table and the level of student learning motivation.

Table 2. Expert Validity Test Criteria and Field Test

Values	Categories	Explanation
90 – 100	Very Good	No Revision
75 – 89	Good	No Revision
65 – 74	Good Enough	Minor Revision
55 – 64	Bad	Mayor Revision
0 – 54	Very Bad	Mayor Revision

(Resource: Ilmudinulloh 2021)

Table 3. Criteria for Interpretating Student Learning Motivation Scores

Values	Categories	Explanation
81 – 100	Very High	Very Effective
61 – 80	High	Effective
41 – 60	Medium	Effective
21 – 40	Low	Ineffective
0 – 20	Very Low	Very Ineffective

(Resource: Hatchi and Sari, 2019)

Table 2 is used to interpret the feasibility of Kahoot! based learning media. and Table 3 is used to interpret student learning motivation scores after using Kahoot! as a quiz in the TGT cooperative learning model.

3. Result and Discussion

After going through two stages, namely the Define and Design stages, the next stage is Develop, a Kahoot-based quiz learning media! feasibility is tested through media expert tests, material expert tests, and field tests. The results of the media validation test stated that the media developed was very good without revision with an average score of 3.7 or 93%.

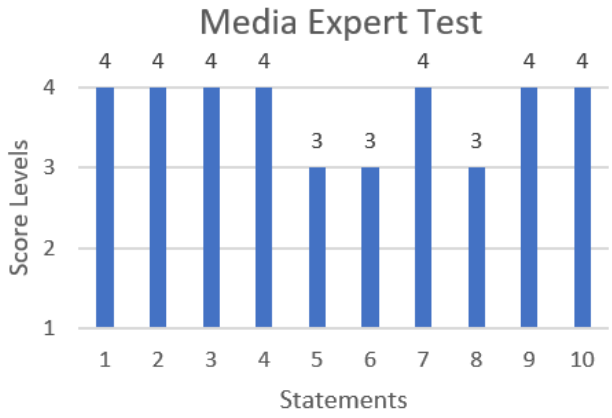

Figure 3. Media Expert Test Result

Media experts gave very good ratings, 4, on seven statements related to aspects of Readability and Youthfulness in Use. In other aspects, it received a good rating, 3, related to the use of background, quiz game instructions, and support for the application of the Team Games Discussion (TGT) Cooperative learning model. The results of the material expert test obtained a good rating without revision with an average score of 3.5 or 88%.

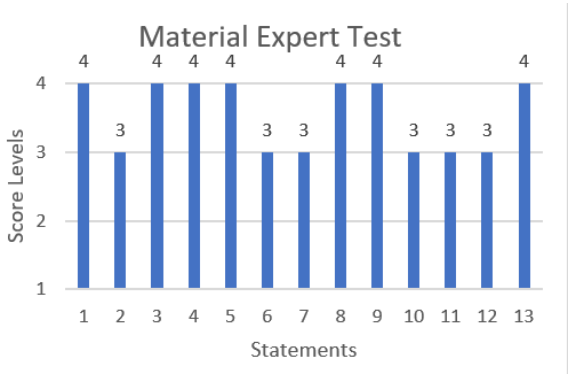

Figure 4. Material Expert Test Result

There are six aspects assessed by material experts namely clarity, practicality, readability, attractiveness, content, and systematism. Of all the statements submitted regarding these aspects, 7 (seven) items received very good ratings, 4, and 6 (six) items received good ratings, 3. The results of field tests on class 6B PAI students obtained very good ratings with an average of - average 3.8 or 95%.

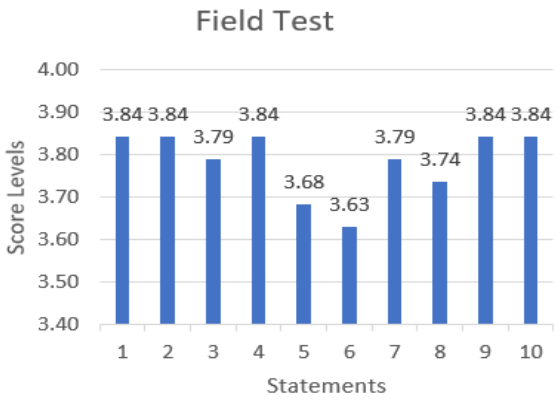

Figure 5. Field Test Result

The highest average score for each statement item is 3.84 related to aspects of readability, attractiveness, and student involvement, and the lowest average score is 3.63 related to instructions for using the media. The next lowest average score is related to the selection of background images used in the media, namely 3.68. The rest get an average score of 3.7 related to the game system, the carrying capacity of the TGT-type cooperative learning implementation, and the use of text colors.

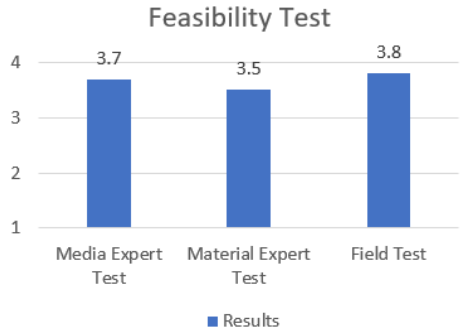

Figure 6. Overall Feasibility Test Result

Figure 6 illustrates the level of acquisition of the average score of the due diligence media based on the Kahoot! on TGT type Cooperative learning. The lowest average score was obtained from the expert test, namely 3.5 or 88% in the good category without revision. Next, the average score for the material expert test is 3.7, or 92% in the very good category without revision. And the highest average score was obtained from the field test, namely 3.8 or 95% in the very good category without revision. Based on the results of the due diligence it can be concluded that Kahoot! as a Quiz in Cooperative learning is valid and feasible to use in learning.

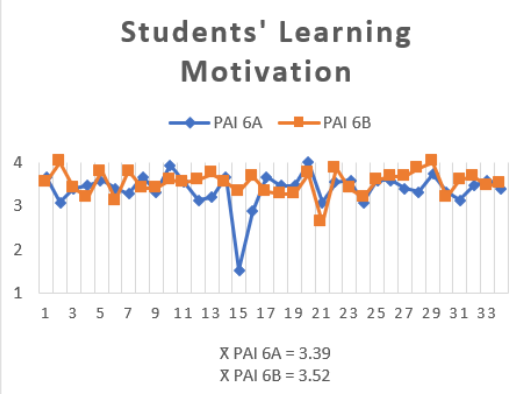

Figure 7. Result of Students Learning Motivation

Figure 7 illustrates the average score of student motivation in two classes, namely PAI 6A with 33 students and PAI 6B with the same number of students so the total number of respondents was 66 students. PAI class 6A obtained an average score of 3.39 or 84.7% of all class members. The lowest score was obtained by respondent no. 15 with an average score of 1.53, followed by respondent no. 16 with an average score of 2.87. The highest average score was obtained by respondent no. 20, namely 4.0. PAI class 6B obtained an average score of 3.52 or 88% of all class members. The highest score was obtained by respondent no. 2 and no. 29, namely 4.0 and the lowest average score was obtained by respondent no. 21 with a score of 2.6.

Based on the results of the assessment of student learning motivation, 6B PAI class showed slightly better motivation than 6A PAI class with an average score difference of 0.13. Nevertheless, the average score obtained by the two classes is in the very high category, where 6A gets an average score of 3.39 or 84% and 6B gets an average score of 3.52 or 88%. From Table 3 regarding Criteria for Interpreting Student Learning Motivation Scores, it can be concluded that learning media based on Kahoot! in cooperative learning the TGT type can increase student learning motivation with very high criteria and is very effective.

The development of learning media based on Kahoot! in cooperative learning is declared feasible and can increase student learning motivation. Media Kahoot! in the form of quizzes principally supports the application of TGT-type cooperative learning (Pello, 2018; Rosyida et al., 2022). According to Slavin (1982), TGT is a type of cooperative learning that uses a scoring system to determine student learning progress through academic tournaments, quizzes, and other types of competition that are competitive and involve collaboration. In practice, students are divided into several groups

proportionally and democratically by taking into account the diversity of social, gender, and academic backgrounds (Isjoni, 2013). Each group competes to be the winner by collecting as many points as possible, the group with the highest points will be the champion in the game (Wyk, 2011). The steps of the TGT-type learning model consist of discussing material with lecturers and students, forming groups, applying game designs, and giving appreciation and reinforcement of the discussion material (Slavin, 1980). When compared to other types, TGT can increase student involvement in class, learning motivation, self-confidence, and understanding of the material discussed, but on the other hand, TGT has the potential to create negative dependencies between group members and noise in class if it is not organized properly (Taniredja et al., 2011). Kahoot fulfills the elements needed by lecturers to implement TGT Cooperative learning (Firdaus & Widayati, 2020).

As a game-based learning platform, Kahoot! helping lecturers to design digital games in the form of quizzes that can be played via devices such as laptops, smartphones, and the like (Cameron & Bizo, 2019). Kahoot! equipped with features such as scoreboards, points, player avatars, champion podiums, timing, and points, and theme choices (Bawa, 2019). Kahoot! provides four types of questions that can be used in-game tournaments such as multiple choice, short answer, true-false, and ordered answers. Kahoot! has two display screens, namely the host screen (lecturer), and the players screen (students). The host screen is the main screen which displays game pins, quiz questions, player avatars, playing time, and champion podiums. Meanwhile, the player's screen only displays quiz questions, time, and player scores (Sibel, 2018). To produce Kahoot! based on learning quizzes, lecturers must create an account on the www.kahoot.com platform, prepare quiz materials such as questions, pictures, and sounds, and customize quiz materials with themes, types of questions, and time duration on the Kahoot! platform, review repeat quizzes, and distribute game pins to students (Christiani et al., 2019). About TGT-type cooperative learning, the position of Kahoot! as a learning medium that replaces the role of conventional media such as paper, blackboards, and other game properties. Kahoot! requires internet service so that students can access the www.kahoot.it page to be involved in games.

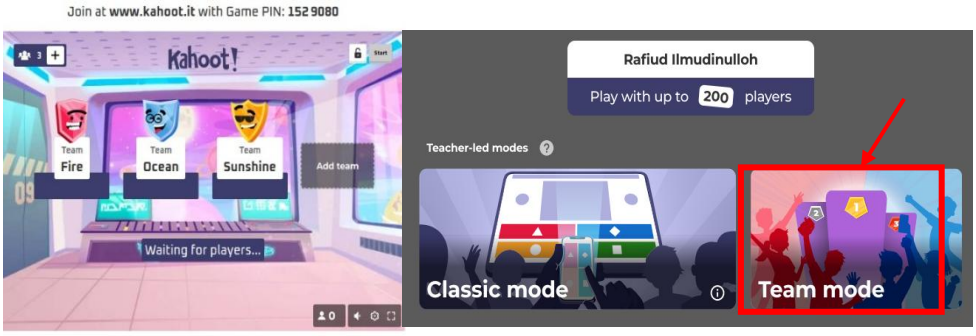

Figure 8. 'Team Mode' Quiz Game

So that it can be played in groups, the lecturer chooses a team game form, team mode, before distributing game pins to students. After entering the game pin on the www.kahoot.it page, students fill in the player's name and choose a team such as Ocean, Fire, Sunshine, etc. according to the lecturer's directions. The form of cooperation that they do is deliberation to determine the correct answer to the question within a predetermined duration of time. The challenge is that the faster the group selects the correct answer, the higher the points the group collects, and vice versa. Speed in making joint decisions is also a factor in the success of the work team.

The basic theory of using Kahoot! in learning itself refers to the theory of intrinsic motivation which was coined by Malone (1981). The theory states that three factors affect a person's motivation, namely challenges, fantasy, and curiosity (Wang & Tahir, 2020). The challenge in a Kahoot-based quiz! is teamwork to determine the correct answer quickly, to get high points. The accumulated value collected by team members will determine the success of the team to occupy the top position. Kahoot! able to create fantasy by changing the classical learning environment into a virtual learning environment like a game show through design and game elements such as scoreboards, player avatars, points, etc. Fantasy integrates activities in the virtual world and the real world to achieve a common goal, to become a winner. Fantasy is enhanced through the use of Audio and graphics included in the game (Baydas & Cicek, 2019). The fantasy generated by Kahoot! able to increase social interaction both in the digital space and the classroom (Hou, 2018; Mustafa et al., 2018). The curiosity evoked by Kahoot! relates to the following types of questions whether multiple choice or true/false, points collected by other groups, and most importantly whether the group's answers were correct or incorrect. Curiosity is formed from students' understanding of the rules of the game and the mechanisms contained in Kahoot! The three factors required by Malone in his intrinsic theory can be fulfilled by using Kahoot! as a learning quiz.

In line with the theoretical framework of the cooperative learning model, Slavin (2015) mentions there are four theoretical perspectives, one of which is the theory of motivation. According to him, motivational variables, both intrinsic and extrinsic, are the most important part of cooperative learning and therefore need to be increased by utilizing the learning environment as a source of motivation such as appreciation, praise, cooperation, and other variables. Another theoretical perspective departs from the social-interdependence theory which states that personal achievement depends on collective achievement, and vice versa (Johnson, 2003). The theory rejects that positive dependence occurs when individuals can cooperate in achieving goals, negative dependence occurs when individuals compete to outperform each other in achieving goals and creates independence in situations where individuals think personal goals can be produced without agreement on common goals (Johnson & Johnson, 2008). And another perspective is the theory of cognitive development and elaboration which recognizes that cooperation can create cognitive conflict within individuals which in turn will stimulate cognitive development (Johnson & Johnson, 1998). The four theoretical perspectives above complement each other and support the application of cooperative learning, which is expected to bring changes in a more effective learning process (Slavin, 2015).

Last research revealed that cooperative learning type TGT assisted Kahoot! effect on students' mastery of material provided that the class organization and internet connection are going well (Syahrurromadhan, 2023). This was reinforced by other research, Pello and Rosyida who also reported on the influence of Kahoot on Cooperative learning (Pello, 2018; Rosyida et al., 2022). The presence of Kahoots! in cooperative learning makes learning more interesting, interactive, and fun so that the material is easily accepted by students (Srifariyati et al., 2023). Kahoot in other types of cooperative learning can improve learning outcomes (Bunga & Desyandri, 2022; Pradikto et al., 2021) and active learning in class (Irwan et al., 2019; Tembang & Merauke, 2020). In addition, Kahoot can also increase interaction and collaboration between class members (Zhang & Yu, 2021). This is influenced by five factors, namely attention that comes from energetic background music and bright colors, competition and flexibility, immersion from virtual game shows, and direct feedback.

About learning motivation, last research report that Kahoot! as a game-based learning can increase learning motivation in basic mathematics subjects through supporting facilities such as stable internet access, gadgets, etc (Setiawan and Soeharto, 2020). In addition, from the results of a survey

conducted by Martín-Sómer, Moreira, and Casado (2021) at the University of Rey Juan Carlos, Spain, Kahoot! turned out to be able to maintain student learning motivation during online learning. Most students find the platform very useful and recommended. The use of Kahoot! to improve students' mastery and understanding of English vocabulary has proven effective it has an impact on student learning engagement and motivation (Rojabi et al., 2022). From the results of Mada and Anharudin's research (2019), motivation and achievement can be increased because the learning environment becomes more enjoyable, students become more active, students prefer group work, and Kahoot as a virtual assessment instrument is more challenging and objective than classical assessment instruments. It is therefore not surprising that most studies report that students' perceptions tend to be positive about using Kahoot! in learning (Adnyani et al., 2020; Bicen & Kocakoyun, 2018; Donkin & Rasmussen, 2021; Ilmudinulloh, 2023; Licorish, 2018; Lofti et al., 2021; Perdana et al., 2020; Robiyati et al., 2020). However, Warsihna and Ramdani (2020) in their research warned that two types of emotions are generated when students play Kahoot! namely positive emotions such as happiness, focus, and interest, and negative emotions such as upset, panic, and worry. An educator needs to pay attention to the compatibility between challenges and competencies possessed by students and also their readiness to participate in Kahoot! Games.

4. Conclusion

Kahoot!-based learning media developed in the 4D research design (Define, Design, Develop, Disseminate) is suitable for use in TGT-type cooperative learning after getting an average score of 93% or very good from media experts, 88% or good from material experts, and 95% or Very good. Media Kahoot! is also able to increase student learning motivation very high and effectively as evidenced by the results of measurements in two classes where 6A class obtained an average score of 84% and 6B class obtained an average value of 88%. Media Kahoot! as a quiz helps the implementation of cooperative learning with design and game elements that have relevance to the main principles of cooperative learning such as collaboration, student engagement, active learning, and appreciation.

The theory of motivation is the basis for positioning the roles of these two concepts, to increase the learning motivation of PAI students. The availability of supporting facilities such as loudspeakers, LCD screens, and the Internet has an important role in using Kahoot! media. because it is quite influential on the psychological atmosphere of students and the smoothness of cooperative learning. Researchers realize that research results cannot be

generalized with phenomena that occur elsewhere, therefore further research is needed to enrich research studies on Kahoot!

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