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Computer science and educational games to enhancing students' Islamic content learning

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ABSTRACT

Learning in all humanities content branch such as Islamic sciences is declared to be boring, tiring and very dry plain content because the educational level of learners becomes low and worrying. This statement is justified by the result of our statistical study which reveals that learning of Islamic content is not attractive and needs to be revolutionized in order to make it more attractive and interesting for the new generation called digital generation. In this paper, we have used the gamification concept with learning analytics (LA) approach to design an educational game to improve Islamic content learning. However, and due to the lake of works and the knowledge about teaching Islamic contents using education games look insufficient and at their begins. The obtained results, in this study, with proposed approach, shows that the students had remarkably higher motivation and performance to learn than before. The main objective of this investigation is, firstly, allows managers and teachers easily incorporate LA approaches to help student improves their learning; and secondly, future work benefits from these results to define an appropriate dashboard for the Islamic content learning and teaching.

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1. INTRODUCTION

The importance of the topic under our hands is a result of the recent large-scale transformations to the new transition to the digital society and digital economy. From qualitative technological changes was immersed a digital society where generation that have grown up in the light of this development gave been designated as a digital generation. Socially, digitization has been linked to education, in its three phases, with the coming of generations that are born and live in this digital environment across the world.

Currently, the main problems of modern education [1] in general and in Islamic content teaching, are related to the lack of commitment and motivation of students to actively participate in the learning process. Thus, the new generations, known as the digital generation, perceive education and the traditional school as an ineffective and unproductive learning environment. Thus, innovation in teaching ensures the improvement of self-esteem, motivation and student success. From this perspective, students who are encouraged to think creatively and independently through the technique of gamification become more interested in discovering concepts on their own and as a result, their rate of learning, levels of success and self-esteem are more improved.

Therefore, after a literature research, educational games are almost absent in collaborative learning of Islamic content despite the fact that several educational games, in other area, have incorporated learning analytics (LA) in this latest decade. The current study, mentioned in this paper, aims to examine the practice-based perceptions of the learner in the teaching of Islamic content in the Algerian University by using educational game, either playing or creating games, in classrooms to assess their opinions on the use of games in their Islamic education courses. The study found that the use of gamification in the university not only played a central role in improving motivations intrinsic and extrinsic students, it also create an attractive learning environment, generates the positive effects to improve the collaborative work of students with teachers [2], [3]. In addition, the study findings recommend that further studies are needed to examine learners' and teachers' perceptions of other subject areas, such as languages, arts, social studies, science, computing and others, regarding the use of gamification in teaching and learning.

Finally, to conclude, this study shows effects of the educational game on students' aptitude/motivation for Islamic content learning in classroom and a comparison with traditional learning methods. According to Tlili *et al*. [4], although educational games are attracting and interactive, they are considered black boxes in the sense that the teachers cannot see how their students are learning. Several researchers have thought of exploiting the big data generated by the student's interaction with the educational game by analyzing them to understand the mechanism of knowledge acquisition. Learning data analytics is often referred to as LA, which is defined as "the measurement, collection, analysis, and reporting of data about students and their context, with the goal of understanding and optimizing teaching, learning and the environments in which it occurs" [5], [6]. Scheneider and Lemos [7] mentioned that provided LA-based feedback can help students perform better in an educational game. Zeng *et al*. [8] further mentioned that LA in learning can help teachers monitor their students, whether they are learning individually or collaboratively and therefore provide support and early interventions. From the information presented in Table 1, one can see the lack of attention given to the development of collaborative educational games for learning Islamic content with the support of LA; this is the main contribution of this study.

Additionally, in study by Dichev and Dicheva [9], were they qualified gamification as a management mode and where gamification is no longer seen as fleeting fad but also a global movement, then there are three types of game elements as depicted on Figure 1 that are involved in gamification (listed in descending order of abstraction). Each element is associated with one or lower and higher-level elements as:

i) Dynamics is the higher level of abstraction. The most important dynamics are attachments, emotion, narrative, progression and relationship.
ii) Mechanisms are the basic processes that conduct action and create user interaction. The mechanisms are challenge, luck, competition, feedback, resource gathering, rewards and victory statuses.
iii) Corposants are achievements, avatars, badges, boss battles, collections, unlocked contents, donations, leader boards, levels, point's quests, social graphs, teams and characters.

Table 1. Learning parameters

Learning parameters	Details
Time of solving activities	Student spends delay of each activity.
Number of wrong responds	During each activity, how is the number of wrong responds student finds the correct one.
Classroom time	The time class spent on achieving a common objective.
Classroom wrong responds	Before they achieve the common objective, how is the number of wrong responds made by classroom students for each activity.

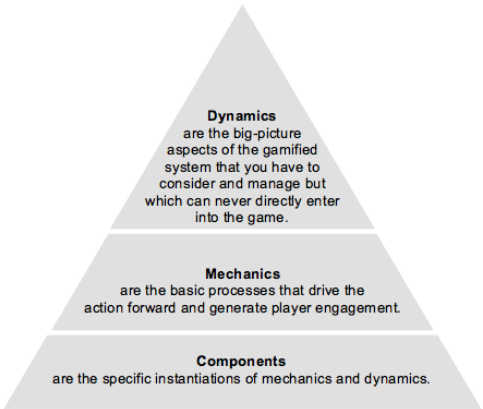


Figure 1. The hierarchy of gamification elements [9]

To conclude, this study attempts to extend this area by developing a collective educational game for student classroom of jurisprudence discipline. This educational game applied different collective paradigm to improve student learning. LA approaches are also integrated to develop automatic dashboards for teachers to monitor their students and provide better real time interventions and for students to keep track well of their learning process.

2. METHOD

2.1. Learning based on educational games

Currently, in the world, there are various conventional methods of learning used as teaching aid deemed suitable in the classical education system, be it at all classroom level. They are used as an alternative to instill knowledge in students using various methods and approaches. Educational game 'gamification' is a newly method and widely used in many countries, where it helps to more improve students' learning.

Historically, and according to what was stated in the paper cited Plucker [10], games are considered as a means of entertainment and training by engaging a user in the game. This feature prompted researchers in the field to use gaming technology in other fields, such as learning nursing the techniques, marketing, and aviation. The most prominent of these uses is the concept of educational game or gamification, using gamification in a context far from the field of games [11], [12]. In other words, to simplify the concept, games engage the user and help him to solve intractable problems [13].

In this direction, the concept of educational game is often suggested as an effective method for valuing the learning, stakeholder engagement, and performance of official actors [14]. It is also proposed by inculcating different principles of participation and motivation in any public activity through game design tools in order to achieve some development in desired behaviors [15]. In order to achieve these goals; several experimental settings have been developed to explore the best way to use this technology to direct user desires in a specific direction and consider the level of its effects on them.

Educational games have a successful history in the field of business and marketing by maintaining user engagement and social interactions while ensuring the quality of various procedures [16] and this is done through the benefits that the user receives when applying for membership, as well as through promotions and other rewards [17] and as evidence of that is, on the many benefits of applying gamification technology in various fields such as marketing, health, and business. There are several recent and extensive experimental studies that the reader can see in the paper [18]. Also, there are new strategies called advergames which are video games that offer advertisements for different products and are designed to promote the company or its products and services [19]. These efforts and other research and studies in this field have encouraged researchers and managers to use different elements of gamification in the field of education to improve student learning, due to the fact that gamification has the ability to improve participation in various activities if it is combined with effective teaching [20]. This allowed several researchers to note an improvement in student participation in general at the end of the experiment.

2.2. Learning analytics and creativity

A learning analytics main objective is learner creativity developing. For achieving this objective, two major components are necessary. The first one is, according to Pavón [21], denoted by 4P namely: person, product, process, and environment press. The second component is that creativity comes in series of steps and not in a single step where each step has a link with 4P steps. Dichev and Dicheva [9] describe creativity as an interaction between environment, process and ability to create whereby each individual or the group's results in a product that is both new and compelling as defined by its social character [22], [23].

Zilka *et al*. [24] stated that most of the studies used traditional tools rather than self-learning technology to assess the learning process in games such as questionnaire, learning tests and interviews. However some studies conducted on games [25], none of them addressed the problem of learning Islamic content. This highlights the need for more practical research in this field. Therefore, this study deals with the development of a collaborative or a collective educational game for teaching Islamic content, which integrates LA approach to provide support for teachers to monitor students while learning.

2.3. Learning analytics designed framework

Engkizar *et al*. [26] highlighted several interaction data should be collected for LA approaches. Current study has relied specifically on skill acquisition theory and interactional theory; thus, it analyzed performance data and communication activity data respectively. Specifically, this can help teachers discover students learning obstacles from the two aspects, the learning performance of each student (individual aspect) and the learning performance of the whole classroom (class aspect). As a result of manipulating these two aspects, each teacher will have the detailed information about how students learn from these two aspects.

The elapsed time was taken as learning parameters, as mentioned and explained in Table 1, in different learning processes, along the activity of game playing, time retrying and wrong responds are collected for each student and each class. Finally, the collected parameters are automatically saved in database using SPSS commands. It should be noted that the collaborative educational game supports up to hundreds of students and Kahoot quiz (response and questions).

To know by teachers how students are progressing in the game more specifically, a dashboard is systematically created to display the current achievements of each individual student and classroom. It will shows completed activities number by the number of correct and wrong responds. The number of wrong responds given in each learning activity and the time spent in this activity is showed on the game dashboard in order to give teachers a global view on student difficulties and to help them.

Figure 2 shows the Kahoot dashboard which displays the number of participants attended the quiz, time answering questions, and the wrong answering questions. Statistics, as shown in Figure 3, presents about students and classrooms are made under SPSS platform was dashboard generates student grouping as a level of low, medium, and high performance. This statistic data, as depicted on Figures 3(a) and (b), provide teachers required intervention means to students according to different learning performance based on two characteristic activity time and wrong responds. Students and classrooms, in this educational game, regarding their performances, are classified in three category levels as: low, medium, and high performance. Figures 4, 5, and Table 2 shows, respectively, in detail the set of question preview pages, the entire students as a player taking the quiz educational game, and time answering question duration with obtained scores.

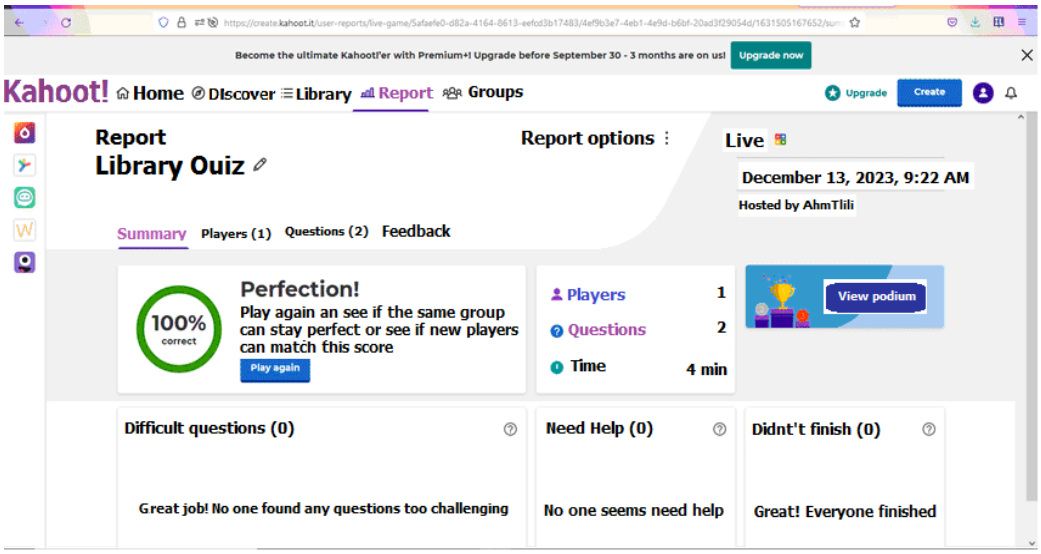
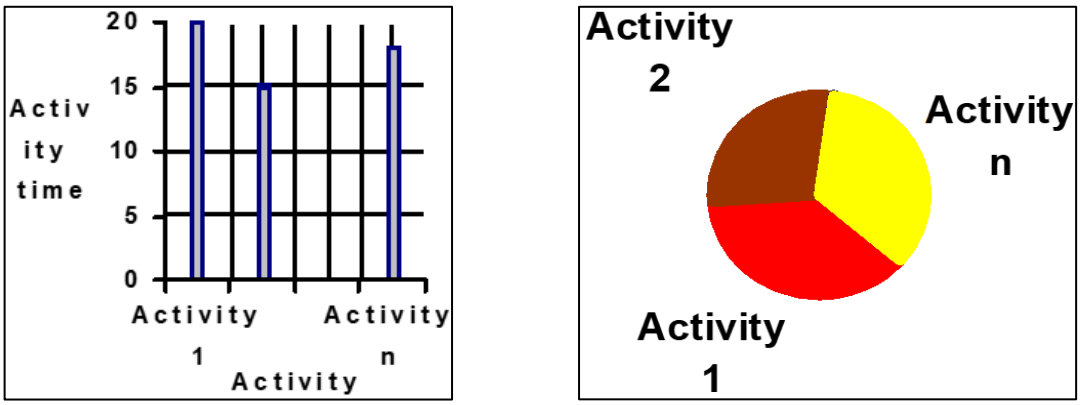


Figure 2. Example of Kahoot dashboard



(a) (b)

Figure 3. SPSS statistics in (a) time spend in second and (b) wrong responds for each activity

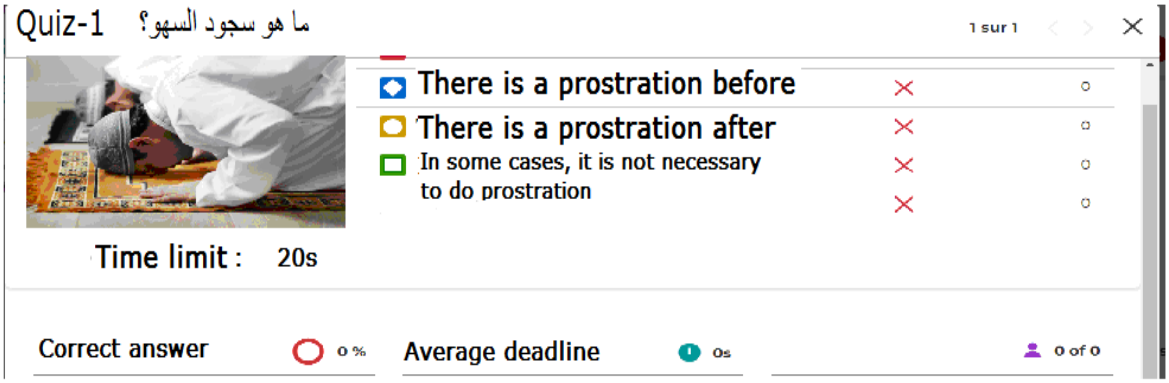


Figure 4. Question preview page

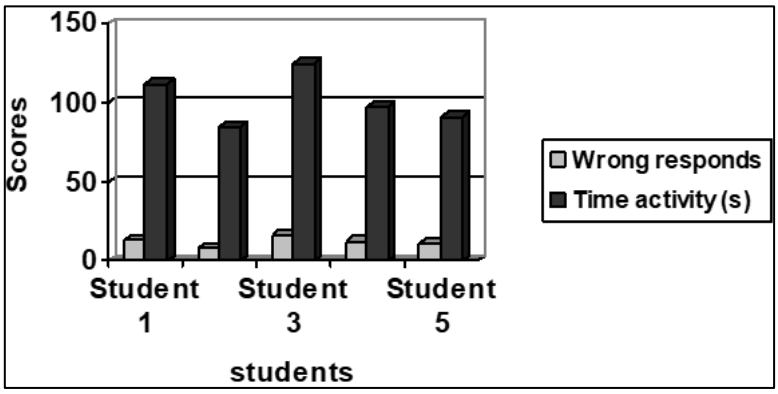


Figure 5. The tool SPSS educational game ranking

Table 2. Student ranking example

Student ranking	Wrong responds	Time activity	Final score
1	13	112	28280
2	8	87	23566
3	16	125	19957
4	12	98	18563
5	11	91	17261

3. RESULTS AND DISCUSSION

3.1. Educational game description

In this case study, we have full taken as a sample two classes, of 30 students of first year of Islamic sciences. The Kahoot platform is used to present the educational game relating to jurisprudence of the Islamic cult. This educational game is composed of three quizzes as shown in Figure 6 and true/false questions as seen in Figure 7, after they are created on this platform, and each containing 30 questions on different subjects of the jurisprudence of the Islamic cult (purification, prayer, and fasting). Time limit for each question is set from 0 to 20 seconds. The total duration is about 10 minutes, but it depends on the speed of the learners' answers. Whoever respond correctly and the fastest gets the most points. In this case, if someone does not respond, they do not receive any point. In addition, the learners ranking is visible after each question and the podium is presented at the end of the game. Whoever gets the most points wins. In this way, the game presenting is made by teacher to students in both classes. Students in each class have exactly 45 minutes to answer the questions in the quiz. The learning process was for an hour and a half for each class and the whole game included 30 questions. Table 3 presents a comparison between main study in this field and provides of some educational games geared to teaching Islamic contents.

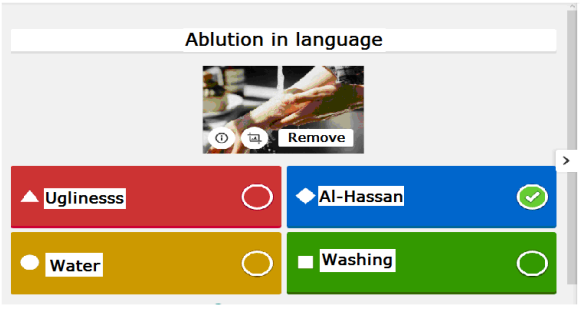


Figure 6. Quiz questions

Figure 7. True/false type question

Table 3. Comparative educational game in Islamic content learning

Educational game	Taught Islamic content	Learning type	Integrate LA
Rahman *et al*. [27]	Islamic law of Zakat	Individual	No
Seman *et al.* [28]	Takaful in Islam	Individual	No
Noor *et al.* [29]	Tajweed learning	Individual	No
Engkizar *et al.* [30]	Integrating ICT in Islamic study	//	No
Ahmad *et al* [31]	Gamification in Halal context	collective	No

Quiz is the questionnaire with multiple responds and awarding of points. True/false a statement or suggestions is answered true or false. With Kahoot platform, we can execute all tasks as mentioned [32]:

– Slide: we add information between the questions (lessons, explanations)
– Poll: ask players to choose from up to 4 reviews
– Free answer: players must enter a short correct answer
– Puzzle: players must put the answers in the correct order
– Quiz and audio: write a quiz question to read aloud
– Word cloud: let participants express their opinion in a few words
– Open question: players must write a long free answer
– Brainstorming: gather, group, discuss and vote on ideas

After the teachers made the presentation of the learning game to students, then the stating of the creation of educational game can became and which consists of two kinds of questions: quiz and true/false questions. We took, on Figures 8 and 9, as a practical case of study a set of question on jurisprudence of the cult (purity and prayer) [33], taken from the lessons of the Islamic sciences first year classroom. Students have in order to self-evaluate their experiences once the quiz is finished, we can use the preview option and if we are satisfied with our quiz, just we must click on the Save button and the quiz as mentioned on Kahoot Figures 10 and 11 will be added in the library and can be tested, played or shared with others.

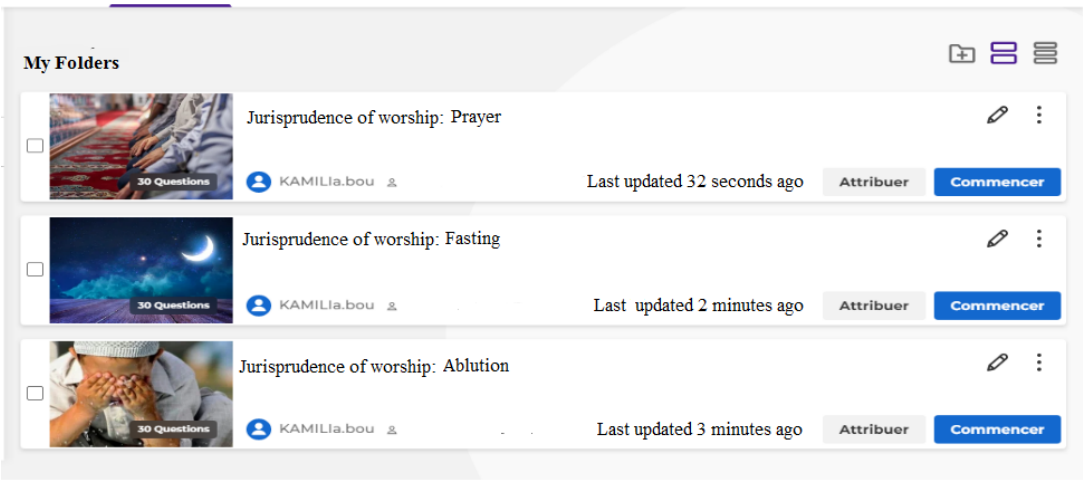


Figure 8. Kahoot of jurisprudence of Islamic cult created by the platform

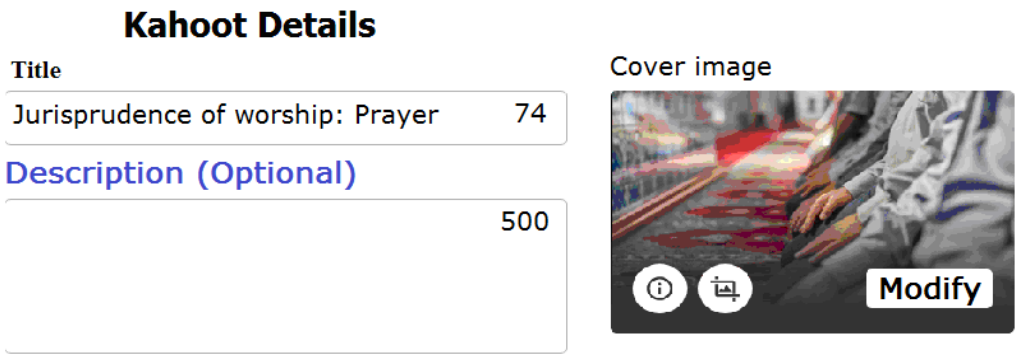


Figure 9. Kahoot settings (in the settings panel, we can enter the Kahoot title, Kahoot describing, and language)

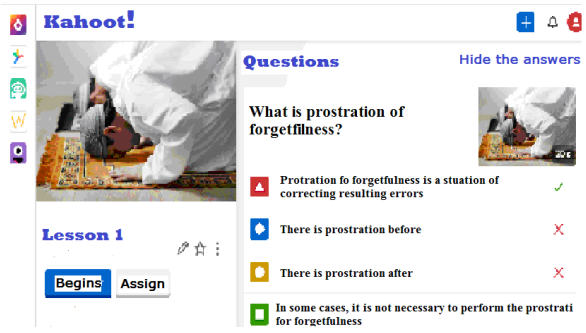


Figure 10. Kahoot quiz kind questions

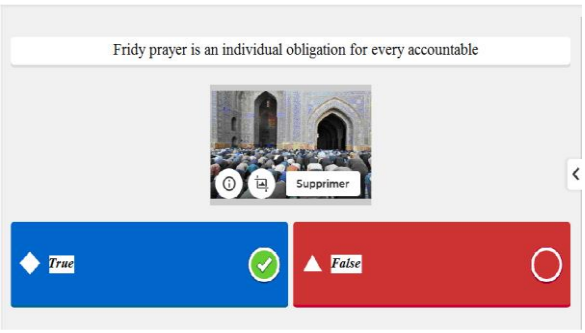


Figure 11. Kahoot true/false kind questions

3.2. Experimental results

To better understand how the educational game could improve the learning performance of students, teachers and students were invited to answer and complete a questionnaire relating to the learning process through gamification technique and the given responds were analyzed qualitatively. From the analyzed questionnaires, it can be seen that the collective educational games are positively useful for teachers and students than the traditional learning methods as depicted in Table 4 where an assigned questionnaire to students to best evaluate the proposed approach in learning domain and well explained in Figure 12. Positive interaction: the importance of LA paradigm is revealed because the dashboard provided by LA helps students to be very motivated and active in their strategies to win or to increase their chance to wining as mentioned in Figure 13. When using traditional learning method, interactions between students was relatively absent. However, it has been observed the emergence of enticements and interactions between teachers and students [34], [35], where students have become questioning about their performance in learning process unless the teachers saw it before the introduction of gamification in education. Animation: it is proved, in literature, which educational games made students very animated. Particularly, it has been observed that students show enthusiasm when using the educational games and that they achieve success where we did not see that enthusiasm in the case of traditional education.

Table 4 questionnaire after using educational game with LA

Question	Yes	No	No responds
Using educational game with LA makes collaborative learning more efficient and productive	29	1	0
Educational game with LA increases student interest of learning	27	2	1
There are no problems understanding how educational game works	26	4	0
Educational game with LA under Kahoot platform is better than traditional education methods	28	2	0
Educational games created activities with LA are more attracting.	23	3	4
The educational game images makes it easier to understand course contents	30	0	0
Jurisprudence educational game study is more suitable than traditional education method.	18	2	0

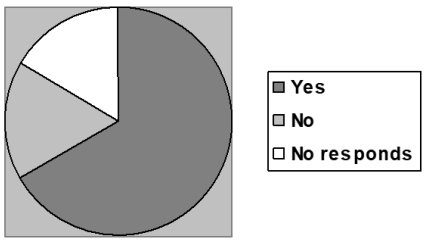


Figure 12. Questionnaire response distribution

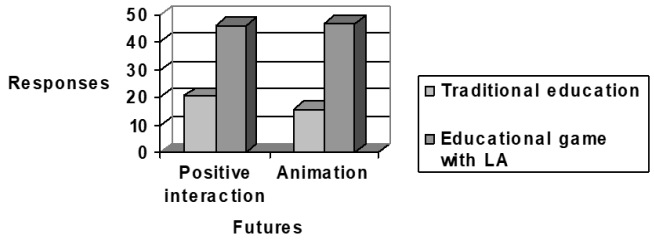


Figure 13. Comparison of the two futures based on the educational type used version

4. CONCLUSION

The classical learning methods in all area and specifically in Islamic content learning has become difficult and boring which has leadership and researchers in this filed into an against time race to come up with revolutionary methods to enhance and motivate students to improve them learn well and this race is truly worth the effort. Consequently, the objective of this work was to seen how educational game with LA improves learning capacities and making the learning task easy for teachers. This objective is focused to determine the role played by this new technique in educational field as resumed to show the impact and role investigation of using educational game with LA (gamification with LA) and its implications in Islamic content learning. Explore how educational game has fostered students' intrinsic and extrinsic motivations in all area of teaching and especially in the Islamic content domain. In future work, we are engaged to elucidate the importance of educational game as an essential educational resource for teaching and providing knowledge on student perception on the use of educational game in university education and this perspective is encouraged by the higher student's level of motivation with LA technique than the students who used classical learning method.

REFERENCES

[1] Đ. Nadrljanski, M. Nadrljanski, and M. Pavlinović, "Digitalization of education," in *Handbook on Intelligent Techniques in the Educational Process*, vol. 29, M. Ivanović, A. Klašnja-Milićević, and L. C. Jain, Eds. Cham: Springer International Publishing, 2022, pp. 17–39, doi: 10.1007/978-3-031-04662-9_2.

[2] M. Kakhkharova and S. Tuychieva, "AI-enhanced pedagogy in higher education: redefining teaching-learning paradigms," in *2024 International Conference on Knowledge Engineering and Communication Systems (ICKECS)*, Apr. 2024, pp. 1–6, doi: 10.1109/ICKECS61492.2024.10616893.

[3] S. Subhash and E. A. Cudney, "Gamified learning in higher education: a systematic review of the literature," *Computers in Human Behavior*, vol. 87, pp. 192–206, Oct. 2018, doi: 10.1016/j.chb.2018.05.028.

[4] A. Tlili, M. A. Adarkwah, S. Salha, J. Garzón, Kinshuk, and D. Burgos, "The effect of educational mobile games on learning performance: a meta-analysis and research synthesis," *Interactive Learning Environments*, pp. 1–23, Jan. 2024, doi: 10.1080/10494820.2024.2310135.

[5] T. Ulfatun, Suyatmini, A. Kusumaningtyas, and Y. A. Setiyawan, "Teacher's understanding of teaching models and students' human literacy," *International Journal of Evaluation and Research in Education (IJERE)*, vol. 12, no. 4, pp. 1925–1933, Dec. 2023, doi: 10.11591/ijere.v12i4.25618.

[6] P. Long and G. Siemens, "Penetrating the fog: analytics in learning and education," *EDUCAUSE Review*, vol. 46, no. 5, pp. 30–32, 2011.

[7] T. Scheneider and R. Lemos, "The use of learning analytics interactive dashboards in serious games: a review of the literature," *International Journal for Innovation Education and Research*, vol. 8, no. 3, pp. 150–174, Mar. 2020, doi: 10.31686/ijier.vol8.iss3.2220.

[8] S. Zeng, J. Zhang, M. Gao, K. M. Xu, and J. Zhang, "Using learning analytics to understand collective attention in language MOOCs," *Computer Assisted Language Learning*, vol. 35, no. 7, pp. 1594–1619, Sep. 2022, doi: 10.1080/09588221.2020.1825094.

[9] C. Dichev and D. Dicheva, "Gamifying education: what is known, what is believed and what remains uncertain: a critical review," *International Journal of Educational Technology in Higher Education*, vol. 14, no. 1, Dec. 2017, doi: 10.1186/s41239-017-0042-5.

[10] J. A. Plucker, "The patient is thriving! Current issues, recent advances, and future directions in creativity assessment," *Creativity Research Journal*, vol. 35, no. 3, pp. 291–303, Jul. 2023, doi: 10.1080/10400419.2022.2110415.

[11] M. H. Hussein, S. H. Ow, L. S. Cheong, M.-K. Thong, and N. A. Ebrahim, "Effects of digital game-based learning on elementary science learning: a systematic review," *IEEE Access*, vol. 7, pp. 62465–62478, 2019, doi: 10.1109/ACCESS.2019.2916324.

[12] K. Larson, "Serious games and gamification in the corporate training environment: a literature review," *TechTrends*, vol. 64, no. 2, pp. 319–328, Mar. 2020, doi: 10.1007/s11528-019-00446-7.

[13] C. Richards, C. W. Thompson, and N. Graham, "Beyond designing for motivation: the importance of context in gamification," in *Proceedings of the first ACM SIGCHI Annual Symposium on Computer-Human Interaction in Play*, Oct. 2014, pp. 217–226, doi: 10.1145/2658537.2658683.

[14] B. W. Waweru, P. S. J. Ng, and H. C. Eaw, "Gamesy: using game mechanics to boost intrinsic motivation in school," *International Journal of Business Strategy and Automation (IJBSA)*, vol. 2, no. 3, pp. 36–52, Jul. 2021, doi: 10.4018/IJBSA.20210701.oa3.

[15] S. Hakak *et al*., "Cloud-assisted gamification for education and learning – Recent advances and challenges," *Computers & Electrical Engineering*, vol. 74, pp. 22–34, Mar. 2019, doi: 10.1016/j.compeleceng.2019.01.002.

[16] Z. Luo, "Gamification for educational purposes: what are the factors contributing to varied effectiveness?" *Education and Information Technologies*, vol. 27, no. 1, pp. 891–915, Jan. 2022, doi: 10.1007/s10639-021-10642-9.

[17] K. Lane *et al.*, "Using gamification to enhance clinical trial start-up activities," *Journal of Clinical and Translational Science*, vol. 6, no. 1, p. e75, May 2022, doi: 10.1017/cts.2022.405.
[18] M. Vesa, "Organizational gamification: roots, readings, directions," in *Organizational Gamification*, 1st ed., New York: Routledge, 2021, pp. 3–19.
[19] V. Dikcius, S. Urbonavicius, K. Adomaviciute, M. Degutis, and I. Zimaitis, "Learning marketing online: the role of social interactions and gamification rewards," *Journal of Marketing Education*, vol. 43, no. 2, pp. 159–173, Aug. 2021, doi: 10.1177/0273475320968252.
[20] P. S. Lengyel, "Can the game-based learning come? Virtual classroom in higher education of 21st century," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 15, no. 2, pp. 112–126, Jan. 2020, doi: 10.3991/ijet.v15i02.11521.
[21] M. Pavón and F. Pavón, "The use of ICT and the 4P's of creativity and innovation in education," in *Handbook of The Management of Creativity and Innovation: Theory and Practice*, L. M. Tang and C. Werner, Eds. Singapore: World Scientific Publishing Company, 2017, pp. 99–115, doi: 10.1142/9789813141889_0005.
[22] A. Royalty, "Design-based pedagogy: investigating an emerging approach to teaching design to non-designers," *Mechanism and Machine Theory*, vol. 125, pp. 137–145, Jul. 2018, doi: 10.1016/j.mechmachtheory.2017.12.014.
[23] A. I. Moreno and J. Traxler, "MALL-based MOOCs for language teachers: challenges and opportunities," *Porta Linguarum Revista Interuniversitaria de Didáctica de las Lenguas Extranjeras*, vol. 10, no. 2, pp. 442–450, Sep. 2016, doi: 10.30827/Digibug.54090.
[24] G. C. Zilka, R. Cohen, and I. Rahimi, "Teacher presence and social presence in virtual and blended courses," *Journal of Information Technology Education: Research*, vol. 17, pp. 103–126, 2018, doi: 10.28945/4061.
[25] J. M. Sykes, "Digital games and language teaching and learning," *Foreign Language Annals*, vol. 51, no. 1, pp. 219–224, Mar. 2018, doi: 10.1111/flan.12325.
[26] R. A. Sheikh, S. Bhatia, S. G. Metre, and A. Y. A. Faqihi, "Strategic value realization framework from learning analytics: a practical approach," *Journal of Applied Research in Higher Education*, vol. 14, no. 2, pp. 693–713, Mar. 2022, doi: 10.1108/JARHE-10-2020-0379.
[27] M. F. Ab Rahman, A. Ab Rahman, H. 'Azeemi Abdullah Thaidi, and N. F. A. Ab Ghani, "A global ZakĀt game: application of technology in teaching and learning for global peace agenda," *Al-Shajarah*, vol. 2019, no. Special Issue Sharia hand Law, pp. 169–189, 2019, doi: 10.31436/shajarah.v0i0.928.
[28] J. A. Seman, N. Ahmad, and N. A. K. Malimc, "Learning Takaful through gamification," *Journal of Critical Reviews*, vol. 7, no. 16, pp. 550–556, 2020.
[29] N. M. Noor, R. L. Yussof, F. H. Yusoff, and M. Ismail, "Gamification and augmented reality utilization for Islamic content learning: the design and development of tajweed learning," in *User Science and Engineering: 5th International Conference, i-USEr 2018*, 2018, vol. 886, pp. 163–174, doi: 10.1007/978-981-13-1628-9_15.
[30] E. Engkizar, I. Muliati, R. Rahman, and A. Alfurqan, "The importance of integrating ICT into Islamic study teaching and learning process," *Khalifa: Journal of Islamic Education*, vol. 1, no. 2, p. 148, Jan. 2018, doi: 10.24036/kjie.v1i2.11.
[31] A. N. Ahmad, I. A. Z. Ahmad, Y. Z. H.-Y. Hashim, N. Samsudin, and M. Zulkurnain, "Gamification in Halal context: theory and potentials," in *Solving Halal Industry Issues Through Research in Halal Sciences*, 1st ed., A. Amid, A. A. M. Elgharbawy, and W. A. Abualsunun, Eds. Singapore: Springer Nature Singapore, 2024, pp. 15–40, doi: 10.1007/978-981-97-3843-4_2.
[32] H. Bicen and S. Kocakoyun, "Perceptions of students for gamification approach: Kahoot as a case study," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 13, no. 2, pp. 72–93, Feb. 2018, doi: 10.3991/ijet.v13i02.7467.
[33] M. H. Fadel, *Islamic jurisprudence, Islamic law, and modernity*, 1st ed. Columbus, Ohio, USA: Lockwood Press, 2023.
[34] S. E. Madsen, N. F. Alleman, B. Newberry, and C. C. Allen, "Teacher power and authority: an analysis of exemplar faculty by career stage," *Teaching in Higher Education*, vol. 29, no. 6, pp. 1588–1605, Aug. 2024, doi: 10.1080/13562517.2022.2078960.
[35] M. A. G. Zuraib, "Sustainability of natural resources in Islamic jurisprudence," *International Journal of Religion*, vol. 5, no. 2, pp. 377–382, Feb. 2024, doi: 10.61707/1hyhyt71.

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