# Development of the Quizizz Platform as an Interactive Quiz-Based Learning Media for Arabic Language Lessons at Madrasah Ibtidaiyah

Akhyar Hanif<sup>1\*</sup>, Herman<sup>2</sup>, Adam Mudinillah<sup>3</sup>, Putri Windi Lailatur Rahmi<sup>4</sup>

<sup>1,4</sup>Universitas Islam Negeri Mahmud Yunus Batusangkar, Indonesia. E-mail: <u>akhyarhanif@iainbatusangkar.ac.id</u>

<sup>2</sup>Universitas HKBP Nommensen Pematangsiantar, Indonesia

<sup>3</sup>Sekolah Tinggi Agama Islam Al-Hikmah Pariangan Batusangkar, Indonesia

Abstracts: This era is full of technology. The use of online learning media is an alternative used by educators to create a learning atmosphere that is not monotonous by displaying animated images so that students do not feel bored. One of the online media used during the learning process is the use of the Quiziz platform. This study aims to develop the quiziz platform as an alternative medium in interactive quiz-based Arabic learning for Madrasah Ibtidaiyah students. Quiziz is an online based game making platform. The research method uses the development method with the Dick and Carey model where the aim of this model is to become a systematic learning process. The purpose of this study was to determine the development of the Quiziz platform as an interactive quiz in learning Arabic at Madrasah Ibtidaiyah. The conclusion of this study explains that the Quiziz platform can assist teachers in creating online-based interactive quizzes and student achievement increases after using the Quiziz platform in the teaching and learning process. The limitation of this research is that the researcher only conducted research on the Quiziz platform as an interactive quiz for Islamic elementary schools, therefore, the researcher hopes that future researchers will be able to conduct research using the same platform, but more developed in other educational units so that research becomes interesting.

Keywords: Quiziz, Learning Media, Interactive Quiz.

### 1. INTRODUCTION

Technological developments have spread to the world of education, so that the world of education is not left behind with applications that can be developed and used as learning media (Kim & Kim, 2018). Technology is not only developing in the industrial world, but also developing in the education world (Alexopoulos et al., 2020). Technology is evidence of the results of scientific developments encountered in everyday life that can help facilitate an activity (Cai et al., 2018). Therefore, education should make use of existing technology for the teaching and learning process, both for facilities and for evaluation in learning (Abba et al., 2020; Herman et al., 2022). Onlinebased learning media is proof that technology plays a role in supporting the teaching and learning process (Yaseen et al., 2019; van Thao et al., 2021). Technology also drives the development of knowledge and skills in learning (Lyndon et al., 2018). Information spread in technology will add to one's insight and knowledge, especially students who are involved in learning (Ahmed et al., 2021). The development of technology is one clear evidence that technology is developing rapidly from time to time (Yaseen et al., 2019). Technological developments also have a positive impact on education (Turan et al., 2018). The reason humans create useful technology is to support all human activities to be more effective and efficient, especially in the world of education (West et al., 2018). Technology has become a basic necessity in life that is useful for facilitating internet-based activities (livari et al., 2020). Technological developments are developing rapidly and sophisticatedly nowadays, triggering the emergence of various kinds of learning media features to support learning.

Technological developments are developing very quickly and rapidly, especially in communication and information technology (Cheng et al., 2018). Technology has become an important part of life (Tahsien et al., 2020). The development of increasingly advanced technology makes people able to use technology as a means and tool in their activities (Awasthi et al., 2018). Technological developments in the world of learning have a positive impact on education (Jin et al., 2019). Technological developments present many features of online learning media that facilitate the teaching and learning process so as to create interesting and not monotonous learning (Melnyk et al., 2018). The use of learning media that is designed according to students' learning needs, gives a positive attitude

and creates an attitude of enthusiasm for learning for students (Bashir et al., 2021). Good use of media will help students understand learning and can even add insight to students.

Technology that is very well developed can help students understand learning material(Al-Maroof & Al-Emran, 2018). Technological developments in this era of globalization spurred the development of online-based learning (Mansfield & Rudra, 2021). Today's technology provides many interesting features (McGhin et al., 2019). Educators are required to be able to innovate and make good use of technology for smooth learning(Dick & Yagmur Akbulut, 2020). Educators are required to be able to balance between in-person learning and online-based learning (Bagley et al., 2021; Herman et al., 2023). Online-based Arabic learning media is one way for educators to improve the quality of student learning so that learning objectives can be achieved (O'Connor et al., 2018). Learning media that are presented with interesting features, easy to understand by students, will add insight to students and make students enthusiastic about learning (Mohamad et al., 2018; Munthe et al., 2021). Learning media that meet good quality standards, namely being able to add insight to students, will result in achieving learning objectives.

Media is the main component in the learning process (Sederholm et al., 2022). Online-based alternative learning media is very appropriate to help the learning process such as Quiziz learning media (Sulistyo et al., 2019; Silalahi et al., 2022). Quiziz learning media is made so that learning is not monotonous, interesting and easily understood by students. Quiziz learning media is made so that learning is not monotonous, interesting and easily understood by students (Britzolakis et al., 2020). One of the urgency of this learning media is that it can increase students' learning concentration so that learning objectives can be achieved (Jalil Piran et al., 2020). This quiziz learning media is a benchmark for students' ability to understand learning (Shen et al., 2021). The development of online learning media such as the Quiziz Platform is a new challenge for educators to be able to create learning media such as the Quiziz Platform is a new challenge for educators to be able to and interesting for students (Rohmani & Andriani, 2021). The development of online learning for students his Quiziz application is an application with a teaching method through interactive quizzes (Bai et al., 2019). Students are required to be able to understand and answer the questions independently displayed in the quiz (Laranjo et al., 2018). The purpose of making questions in the form of games is so that students can repeat lessons that have been delivered by educators at school.

The Quiziz application is evidence of technological developments in learning (Follana-Berná et al., 2020). This quiziz application can motivate students by presenting an attractive and easy-to-understand display (Song et al., 2019). The Quiziz application can be used to create interactive quizzes that are easily accessible on all devices such as smartphones, computers and other devices to complete quizzes that have been created by educators (Balapour et al., 2019). This online-based application is suitable for measuring students' understanding of Arabic learning material (Ritonga et al., 2020). This application is equipped with statistical data that can describe the extent to which students are able to understand the material presented by educators (Arghashi & Yuksel, 2022). The Quiziz application can invite students to compete in a healthy manner while at the same time motivating students' learning so as to improve learning outcomes which can be seen from the final score of this game.

Evidence of the development of technology into the world of education is marked by the increasing number of online-based learning media found such as the Quiziz Platform (Li et al., 2020). This quiz platform is often also referred to as learning media in the form of educational games which aim as a means of conveying material and as a medium for measuring abilities (Chen et al., 2021). The advantage of the quiziz application itself is that material can be accessed anytime, anywhere and by anyone (Jammalamadaka & Tappa, 2018). The quiziz platform also provides a variety of interesting features, so students don't feel bored (Hwang & Choi, 2020). The interesting Quiziz platform makes students excited to answer questions posed by educators (Eiter et al., 2018). The Quiziz platform can also conclude how well students understand learning.

The same research was conducted by (Fuad & Khusna, 2022) stated in his research entitled 'Development Quiziz Media for Online Learning for Class IV English Subject at Madrasah Ibtidaiyah' stated that Quizizz-based online learning media for English subjects at MI Darul Huda Deyeng worth using. Then, according to (Salsabila et al., 2020) also conducted the same research on the quiziz application stating in his research entitled 'Utilization of 373

the Quizizz Application as Learning Media in the Middle of a Pandemic for High School Students' stated that onlinebased learning is a form of government policy. The use of the Quiziz application aims to make students learn innovatively and convey material through the application. Online-based learning media such as Quiziz is quite effective as a distance learning media because it can be accessed anywhere and anytime. Student Cognitive" states that online-based applications such as Quiziz are effectively used in the learning process to measure how much ability students have. The difference between this research and previous research is that previous research has not used many attractive features in learning media so that the learning media. Previous research has not used many attractive features in learning media so that the learning media is quite monotonous due to the limitations of an educator's innovation because there is still a lack of knowledge about this online-based learning media, namely the Quiziz application. Meanwhile, this research will be used more effectively because the quiziz application that is displayed now uses many interesting learning features, so that learning is not monotonous and the material is easily accepted by students. Educators are increasingly issuing innovations to make interesting Arabic learning media so that students don't feel bored in learning.

The reason for conducting this research is to attempt to re-examine the development of the quiziz platform as an interactive quiz-based learning media for Arabic at Madrasah Ibtidaiyah. It is hoped that students can take advantage of this Arabic language learning media as well as possible, in order to achieve learning objectives. The development of the Quiziz platform is appropriate for use and can be considered for its existence to assist the process of learning Arabic in Madrasah Ibtidaiyah, because the learning media for the Quiziz platform are presented with interesting features, and are not monotonous so that students can understand learning. Based on the explanation above, it is necessary to carry out an action or improvement regarding problems in learning, so the researchers are trying to develop a platform in the form of a quiz as a medium to help learning Arabic at Madrasah Ibtidaiyah.

#### 2. RESEARCH METHODS

Learning media Quiziz Platfrom which was developed according to the procedure using references developed by Gall, Gall & Borg which was then simplified by Dick and carey, in research by applying the Dick and Carey model developed by Walter Dick and Lou Carrey in 1985. Dick and Carey model is a model developed on the use of the System Approach to the basic components of the learning system which includes analysis, design, development, implementation and evaluation (Chiou et al., 2021). This model is one of today's rapidly growing learning media that supports the learning process (Matarazzo et al., 2021). The method that researchers use to analyze this research using qualitative methods. This model is suitable for use in research because the data obtained is detailed, comprehensive and accurate according to what happened in the field (Nguyen et al., 2019). The quiziz platform learning media is used to convey learning as well as to assess students' abilities after the learning process is carried out (Cacheda et al., 2019). The advantage of the Dick and Carey model is that the flow of the model development is carried out in stages, the steps taken are critical, and trials of this development are carried out.

This research model is accurate by using several components as well as steps (Javaid & Haleem, 2018), namely: 1. Identifying General Learning Objectives, 2. Conducting Learning Analysis, 3. Identifying Student Behavior and Characteristics, 4. Formulating specific Learning Objectives, 5. Developing Research Instruments, 6. Developing Learning Strategies, 7. Developing and Selecting Learning Materials, 8. Designing and implementing formative evaluations, 9. Revision of learning programs, 10. Designing and developing summative evaluations. This type of research is development research (Development) with the aim of testing the correctness of the data. The main aim of research and development is not to formulate or test a theory, but to develop effective results for use in schools.

Researchers use the Dick and Carey Model which has 10 components as well as steps which are briefly described in the table below.

level	Steps	activity		
Identifying Common Learning Objectives	1	Analyze and know the competencies that students must have		
Conducting Learning Analysis	2	Know the skills and knowledge that students have Knowing the skills that students already have before and after learning		
Identify Student Behavior and Characteristics	3	Knowing the skills that students already have before and after learning		
Formulating Specific Learning Objectives	4	Knowing about the knowledge, skills, and factors that can determine the success of students after studying so that learning objectives can be achieved		
Develop Learning Instruments	5	Knowing about the knowledge, skills, and factors that can determine the success of students after studying so that learning objectives can be achieved		
Develop Learning Strategies	6	Knowing the components that support the achievement of learning objectives		
Developing and Selecting Learning Materials	7	<ul> <li>Dick and Carey suggest 5 components:</li> <li>The author analyzes pre-learning activities</li> <li>The author pays attention to the presentation of information obtained by students</li> <li>The author analyzes the participation of learners</li> <li>The author conducts testing and testing of students</li> <li>Learners design follow-up activities in learning</li> </ul>		
Designing and Implementing Formative Evaluations	8	Dick and Crey offers 3 components of formative evaluation: Individual evaluation Small group evaluation Field trials		
Revision of the Learning Program	9	Know the difficulties and mistakes in learning		
Designing and Developing a Summative Evaluation	10	Knowing the intelligence abilities possessed by students		

Table	1.	The	stages	and	steps	in	this	research	are.

Time and place of research conducted at Madrasah Ibtidaiyah AI-Falah Payakumbuh. This research was conducted in October 2022. The subjects and objects of this research were material validators, media, language, teachers and students. The object of this study focuses on the feasibility of the Quiziz Platfrom learning media to measure students' abilities in learning Arabic. Data Collection Techniques in this study used Observation techniques (performed non-participantly, researchers were not in the location to observe students and researchers observed students in a structured manner while studying at Madrasas or at home by analyzing conditions before or after the Development of the Quiziz Platform), and Questionnaires Material, Media and Language feasibility test (conducted by distributing questionnaires to students, with the aim of knowing student responses to the media being developed).

#### 3. RESULTS AND DISCUSSIONS

#### 3.1. Results

The results that the researchers obtained from the Development of the Quizizz Platform as an Interactive Quiz-Based Learning Media for Arabic Language Lessons at Madrasah Ibtidaiyah for Arabic language learning media courses were analyzed from the beginning to the end of the study. The development of learning media is carried out by analyzing learning material through filling out a questionnaire and continuing with the collection of learning material. Furthermore, the analysis of learning media is carried out by making learning quizzes as a medium for learning, which is also equipped with animated images so that the learning media for Quiz Platform learning is not boring and also not monotonous, because it is adapted to the needs of students in Madrasah Ibtidaiyah. The quiziz platform produces learning media in the form of interactive quizzes and then the media is assessed or validated by media, material and language experts. The results of an assessment of the feasibility of material, language and quiziz platform learning materials in Arabic learning media courses are:

#### 3.2. Media Feasibility Validation Sheet

The results obtained after the media feasibility trials conducted by media experts concluded that the learning media made were feasible to use. Purpose Media validation aims to see the shortcomings of the quiziz platform media. The learning media in the form of a quiziz platform, the researchers aim to use as Arabic language learning media in Madrasah Ibtidaiyah. The validation assessment carried out by students was in the form of filling out a questionnaire. Filling out the questionnaire aimed at assessing the appropriateness of a learning media to use. This study aims to obtain data that learning media using the quiziz platform are appropriate for use in the learning system, and make it easier for students to understand learning, because this application is in the form of an educational game as an evaluation of students' abilities. Research data for the quiziz platform learning media on the eligibility validation sheet of a media can be seen in the table below.

No	Assessment Aspects	Strongly agree (SS)	agree (S)	Don't agree (TS)	Strongly Disagree (STS)	criteria
1	This quiziz platform is equipped with interesting pictures	50%	36,7%	13,3%	-	Strongly agree (SS)
2	Quiziz Platform is an educational game application	46,7%	33,3%	10%	10%	Strongly agree (SS)
3	The quiziz platform is suitable for use as a medium for learning Arabic	33,3%	43,3%	10%	13,3%	agree (S)
4	This platform is equipped with two languages namely Arabic and Indonesian	43.3%	46,7%	10%	-	agree (S)
5	The function of the quiziz platform is as a medium for measuring students' ability to understand learning	26,7%	66,7%	3,3%	3,3%	agree (S)
6	The quiziz platform is a distance learning medium	23,3%	53,3%	13,3%	10%	agree u (S)
7	Learning media with a quiz platform is needed in learning Arabic	40%	36,7%	20%	3,3%	Strongly agree (S)
8	The suitability of the material with learning Arabic	36,7%	35,7%	22,7 %	4,9%	Strongly agree (SS)
9	Color compatibility with text	23.3%	36,7%	33,3%	6,7%	agree (S)
10	The time for doing the quiz is very flexible	46,7%	36,7%	13,3%	3,3%	Strongly agree (SS)

Table 2. Media Feasibility Validation Sheet.

Note: S = agree; TS = Don't agree; STS = Strongly disagree.

Data from the results of the media feasibility trials can be described as follows: Describes that 30 students who served as testers or assessors in this study, the results of the students' highest assessment of the validation of the feasibility of learning media material for the development of the Quiziz Platform to measure students' abilities in learning language Arabic gets the highest presentation of 50%, based on the presentation of achievement of validation of the eligibility of the media, it is included in the strongly agree (SS) category. The results of the second highest assessment of the feasibility validation of learning media material for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained the highest presentation of 43.3%, based on the presentation of validation achievement on media eligibility, included in the agree category (S). The results of the fully highest assessment of students on the validation of the feasibility of learning material for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained the highest presentation of 33.3%, based on the presentation of validation achievement on media eligibility, included in the disagree category (TS). And the results of students' research on validating the feasibility of learning media material for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained a presentation of 33.3%, based on the presentation of validation achievement on media eligibility, included in the disagree category (TS). And the results of students' research on validating the feasibility of learning media material for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained a presentation of 0%, based on the presentation o

validation achievement on media eligibility, included in the strongly disagree category (STS).

#### 3.3. Material Feasibility Validation Sheet

The results obtained after the material feasibility trial concluded that the learning media made were feasible to use. Purpose Material validation aims to see the shortcomings of the quiziz platform media. The learning media in the form of a quiziz platform, the researchers aim to use as Arabic language learning media in Madrasah Ibtidaiyah. The validation assessment carried out by students was in the form of filling out a questionnaire. Filling out the questionnaire aimed at assessing the appropriateness of a learning media to use. This study aims to obtain data that learning media using the quiziz platform are appropriate for use in the learning system, and make it easier for students to understand learning, because this application is in the form of an educational game as an evaluation of students' abilities. Research data for the quiziz platform learning media on the eligibility validation sheet of a material can be seen in the table below:

No	Assessment Aspects	Strongly agree (SS)	agree (S)	Don't agree (TS)	Strongly Disagree (STS)	Criteria
1	The quiziz application helps students to understand learning Arabic	65,5%	31%	3,4%	-	Strongly agree (SS)
2	Quiziz application as a medium to measure students' ability to understand learning material	37,9	62,1	-	-	agree (S)
3	The quiziz application is a form of technological development in the world of education	46,7%	53,3%	-	-	agree (S)
4	The advantage of this quiziz application is that it is very easy to access anywhere, anytime, and by anyone	40%	56,7%	3,3%	-	agree (S)
5	Quiziz application as a medium for student learning motivation	55%	45%	-	-	Strongly agree (SS)
6	The quiziz application is very suitable for use in Arabic learning media	46,7%	42,7%	10,6%	-	Strongly agree (SS)
7	The quiziz application is effective for increasing student learning outcomes	40%	56,7%	3,3%	-	agree (S)
8	The images displayed in this application are very interesting	43,3	53,3	3,3	-	agree (S)
9	The language used in this application is easy for students to understand	40%	60%	-	-	agree (S)
10	The quiziz application is a learning medium in the form of an educational game	60%	40%	-	-	Strongly agree (SS)

Table 3. Material Fea	asibility Validatio	n Sheet.
-----------------------	---------------------	----------

Information :

SS = Strongly agree

S = agree

TS = Don't agree

STS = Strongly disagree

Data on the results of the material feasibility trials can be described as follows: Describes that the 30 students who were used as testers or assessors in this study, the results of the students' highest assessment of validating the feasibility of the material for learning development Quiziz Platform to measure students' abilities in learning Arabic obtained the highest presentation of 65.5%, based on the presentation of achievement of validation of the feasibility of the material, included in the strongly agree (SS) category. The results of the second highest assessment of the validation of the feasibility of learning media material for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained the highest presentation of 62.1%, based on the 377

presentation of validation achievement on material eligibility, included in the agree category (S). The results of the third highest assessment of students on the validation of the feasibility of learning material for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained a presentation of 10.6%, based on the presentation of validation achievement on the eligibility of the material, included in the disagree category (TS). And the lowest research results of students regarding the validation of the feasibility of learning media material for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained a presentation of 0%, based on the presentation of achievement validation of the eligibility of the material, included in the strongly disagree category (STS).

## 3.4. Language Eligibility Validation Sheet

The results obtained after the language feasibility trials carried out concluded that the learning media made were feasible to use. The purpose of language validation is to see the shortcomings of the quiziz platform media. The learning media in the form of a quiziz platform, the researchers aim to use as Arabic language learning media in Madrasah Ibtidaiyah. The validation assessment carried out by students was in the form of filling out a questionnaire. Filling out the questionnaire aimed at assessing the appropriateness of a learning media to use. This study aims to obtain data that learning media using the quiziz platform are appropriate for use in the learning system, and make it easier for students to understand learning, because this application is in the form of an educational game as an evaluation of students' abilities. Research data for the quiziz platform learning media on the eligibility validation sheet of a media can be seen in the table below:

No	Assessment Aspects	Strongly agree (SS)	agree (S)	Don't agree (TS)	Strongly Disagree (STS)	Criteria
1	The language used is easy to understand	56,7%	26,7%	13,3%	3,3%	Strongly agree
2	Correct use of words in Arabic	36,7%	40%	20%	3,3%	agree (S)
3	Use the correct sentence structure	40%	36,7%	20%	3,3%	Strongly agree (SS)
4	The sentence structure is standard	36,7%	35,2%	23,3%	4,8%	Strongly agree (SS)
5	The language used is effective and efficient for learning Arabic	30%	46,7%	20%	3,3%	agree (S)
6	Commonly used language in everyday life	30%	46,7%	20%	3,3%	agree (S)
7	The language used is in accordance with the level of students' emotional development	36,7%	46,7%	13,3%	3,3%	agree (S)
8	The language used is in accordance with the intellectual development of students	36,7	43,3%	13,3%	6,7%	agree (S)
9	Accuracy in the use of Arabic terms	30%	40%	23,3%	6,7%	agree (S)

Table 4. Language Feasibility Validation Sheet.

Information :

SS = Strongly agree

S = agree

TS = Don't agree

STS = Strongly disagree

The data from the language feasibility trials can be described as follows: Describes that 30 students were used as testers or assessors in this study, the results of the students' highest assessment of language feasibility

validation of learning media for the development of the Quiziz Platform to measure students' abilities in learning Arabic received the highest presentation of 56.7%, based on the presentation of achievement validation of language feasibility, included in the strongly agree (SS) category. The results of the second highest assessment of the validation of language feasibility for learning media for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained the highest presentation of 46.7%, based on the presentation of validation achievement on language eligibility, included in the agree category (S). The results of the third highest assessment of students on the validation of language eligibility for learning the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained a presentation of 23.3%, based on the presentation of achievement validation of language eligibility, included in the disagree category (TS). And the results of students' research on language feasibility validation of learning media for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained a presentation of 23.3%, based on the presentation of achievement validation of language eligibility, included in the disagree category (TS). And the results of students' research on language feasibility validation of learning media for the development of the Quiziz Platform to measure students' abilities in learning Arabic obtained a presentation of 0%, based on the presentation of validation achievement on language feasibility, included in the strongly disagree category (STS).

### 4. DISCUSSION

The result of this research is the Development of the Quiziz Platform as an interactive quiz-based learning media for Arabic at Madrasah Ibtidaiyah. The use of the Quiziz Platform is useful for helping the process of learning Arabic in Madrasah Ibtidaiyah so that students can understand learning, as a medium for measuring students' abilities so that learning objectives can be achieved. The Quiziz platform is one of the online-based learning media that supports learning activities at Madrasah Ibtidaiyah. The advantages of this quiziz application are that the material can be accessed anytime, anywhere and by anyone, and is equipped with a variety of interesting features, so students don't feel bored, and as a medium for evaluating student learning. The components as well as the steps contained in the Development of the Quiziz Platform are a reference for the development of the Dick and Crey model.

The first step that can be used to analyze or identify a research that will be used in the development of the Quiziz Platform in Arabic learning media later is to identify general learning objectives. This initial step aims to be able to find out the competencies that students must have after participating in the Arabic language learning process at Madrasas. Learning objectives are something that students must have after completing the learning process. The learning objectives themselves can be carried out by paying attention to as well as conducting research related to the needs of students. The main target in this learning objective is related to the content in the implementation of the field of study that has been conveyed in the learning process activities. Before this step is carried out, a literature review on the conversion of the learning curriculum is first carried out. So, it can be concluded that Identifying General Learning Objectives is the first step that must be taken when conducting field research later.

The next thing to do in research is to do a learning analysis. At this stage of the study explained that learning analysis aims to achieve the objectives of learning, namely to identify the skills and knowledge that students must have. This learning analysis is carried out to guarantee or strengthen that a development activity carried out is accurate or does not mix with learning material that is not needed in learning. Identifying skills is done to hone and train the abilities of students who are latent within themselves. Dick and Carey argue that learning analysis is a method used for skills as a condition for being able to learn subsequent skills in learning.

After conducting a learning analysis, the next step that must be done is to identify the behavior and characteristics of students. The analysis carried out is related to the skills that have been possessed by students before or at the beginning of learning. Skill is a component that functions as a determinant of the success of a learning. The behavior of students is a determinant of the course of a learning or not, because good behavior will understand and implement a method that supports the goal of achieving a learning. While the analysis of the characteristics of students is related to the abilities possessed by students, both in attitudes, learning styles, and abilities possessed by students. So, the purpose of identifying the behavior and characteristics of students is so that the skills that already exist in students can be further developed and learning objectives can be achieved.

Specific Learning Objectives are interrelated with general learning objectives, because specific learning objectives are a continuation of the steps taken in analyzing data. Specific learning objectives are statements that

must be made by students after completing learning activities. Matters of concern in this particular learning objective are related to the knowledge and skills possessed by students after participating in the learning process, as well as the factors that determine the success of students in taking the learning process. So, it can be concluded that formulating specific learning objectives aims to determine knowledge, skills, and factors that can determine the success of students after taking learning so that learning objectives can be achieved.

After Formulating Specific Learning Objectives, the appropriate steps are taken afterwards, namely Developing Learning Instruments. This learning instrument aims to be able to measure the ability of students so that the learning objectives that have been prepared are achieved. The purpose of this instrument is also to determine the tips or performance of students to achieve learning goals. There are 4 tests that are used as a benchmark for developing learning instruments developed by Dick and Carey, namely: a test to measure the skills of students at the initial level of the learning process, a test that aims to identify the background or profile of learning related to learning analysis, then the test that carried out when the learning process is in progress, as well as a test that aims to analyze parts of the prison that have not yet been implemented in the learning process.

If the Specific Learning Objectives have been carried out, then the next step is to Develop a Learning Strategy. The learning strategy itself is a continuation of specific learning objectives that aim to find out what components must be made to achieve learning objectives. Learning strategies can be in the form of media that supports the learning process, for example media that can be used for learning presentations, Educators can use media images to present learning. Things that must be considered in developing learning strategies in the form of providing motivation to describe the importance of learning in students, informing learning objectives that must be achieved, explaining the skills needed in learning activities and educators explaining the scope of learning that must be achieved during the process learning takes place. The Dick and Carey model suggests 5 components that need to be carried out in a Learning Strategy namely, (Pre-learning activities in the form of Providing motivation to illustrate the importance of learning in students), (Presenting Information related to the delivery of learning material as a learning strategy), (Student participation in a learning activity to achieve learning objectives), (Testing and testing seeks to measure and hone students' skills both before and after learning), and (Follow-up activities aim to ensure that all components are carried out well so that learning objectives are achieved).

Developing and Selecting Learning Materials aims to argue that in choosing learning materials must be adapted to the students themselves, such as choosing learning materials that are interesting, not monotonous, the content is appropriate and appropriate, learning materials contain elements of information needed by students, there are questions and answers to measure students' self-ability and contain instructions that must be carried out by students for the next stage. Developing and selecting learning materials are concrete steps taken by researchers. Types, types and models in choosing learning materials are also presented in the learning material sub-section. The purpose of conveying these reasons is so that students prepare themselves to receive learning material according to a predetermined model.

If the Learning Strategy Development has been carried out, then the next step that researchers must take is to Design and Conduct Formative Evaluation. Formative evaluation occurs when the learning process is in progress, with the aim of being able to support the process of increasing the effectiveness of student learning. Formative evaluation in development includes 3 phases, namely (Individual Evaluation, Small Group Evaluation and Field Trials). Researchers carry out formative evaluations using research questionnaires from students and teachers to find out the changes that occur in learning, whether learning is appropriate to use and find out how to make changes related to procedures and materials in learning that are felt to be less effective and efficient in learning. The component of this formative evaluation is also to find out the mistakes that occur in learning and problems that often occur and are felt by students in learning.

Next, make revisions to the learning process. Revisions are made to the learning process, namely to the learning model or program applied, the steps taken, as well as other components that support the achievement of learning objectives. At this step, the researcher found that the revision of the learning process aims to find out the difficulties felt by students in learning, errors in learning, both material, techniques and others, as well as to identify deficiencies in learning. Dick and Carey suggested about 2 types of revisions to the learning process, namely (Revisions related to all components in learning) and (Revisions to the methods or techniques used in learning).

The last step that the researchers took in developing the Quiziz platform as an interactive quiz-based learning medium in learning Arabic at madrasah ibidiaiyah using the Dick and carey model is Designing and Developing a Summative Evaluation. Summative research is the process of determining whether or not a lesson is adequate. Development of Summative Evaluation aims to determine the progress or learning outcomes of students in learning. Educators can carry out a Summative Evaluation in the form of questions by paying attention to the level of difficulty of the questions in learning. Students must pay attention to questions with a moderate level of difficulty that must be higher than the difficulty level of low and high questions. So, the purpose of the design and development of summative evaluation is to know the level of progress that has been achieved by students, to know the efforts made by students in learning and to see how far students use their intelligence abilities in learning.

The purpose of this study was to increase students' motivation in learning, as well as to evaluate students' abilities through learning media in the form of the quiziz platform used for Arabic language learning media in Islamic elementary schools. The steps described above can help students to achieve learning objectives. The purpose of making learning media is in the form of a quiziz platform so that it can help students understand learning Arabic at Madrasah Ibtidaiyah AI-Falah Payakumbuh. Another purpose of this quiziz platform learning media is for students to be more enthusiastic in learning so that learning can be understood by students, and also as a medium for evaluating students' abilities in learning so that learning objectives are achieved. The model used in the development of the quiziz platform is the Dick and Carey model, which aims to measure students' abilities in learning Arabic.



Figure 1. Example of an Image Form Quiziz Platform

The picture above is a form of Platfrom Quiziz learning media, which functions as an Arabic language learning medium. The Quiziz Platform can be used to create interactive quizzes that are easily accessible on all devices such as smartphones, computers and other devices to complete quizzes that have been made by the teacher. This online-based application is suitable for measuring students' understanding of Arabic learning material. This application is more effective to use, because the quiziz application that is displayed uses many interesting learning features, so that learning is not monotonous and the material is easily accepted by students. Educators are also issuing more and more innovations to make Arabic learning media interesting so that students don't feel bored in understanding learning. This quiz platform is often also referred to as learning media in the form of educational games which aim as a means of conveying material and as a medium for measuring abilities. The advantage of the quiziz application itself is that the material can be accessed anytime, anywhere and by anyone, making it easier for students to understand learning so that learning goals can be achieved.

Technological developments are developing very rapidly now, making it easier for students to access learning materials developed by educators, one of the evidences of technological developments in education is the presence of quiziz platform learning media. This quiziz platform can support the student learning process so that the material can be understood to create learning objectives. The purpose of making learning media is in the form of a guiziz platform so that it can help students understand learning Arabic at Madrasah Ibtidaiyah Al-Falah Payakumbuh. Another purpose of this guiziz platform learning media is for students to be more enthusiastic in learning so that learning can be understood by students, and also as a medium for evaluating students' abilities in learning so that learning objectives are achieved. The model used in the development of the guiziz platform is the Dick and Carey model, which aims to measure students' abilities in learning Arabic. The Dick and Carey model can be an interactive guiz. The Dick and carey model is a model developed on the use of the System Approach to the basic components of a learning system which includes analysis, design, development, implementation and evaluation developed by Walter Dick and Lou Carrey. The time and place of the research was carried out at Madrasah Ibtidaiyah Al-Falah Payakumbuh, with the research object of developing this guiziz platform to measure the potential abilities of students as well as a medium for delivering material. The purpose of developing this guiziz platform is to assess the appropriateness of a learning media used in Madrasah Ibtidaivah. The model developed by Walter Dick and Lou carrey has 10 stages as well as steps used in learning media, namely: Identifying general learning objectives, Conducting learning analysis, Identifying behavior and characteristics of students, Formulating specific learning objectives, Developing learning instruments, Developing strategies learning, developing and selecting learning materials, revising learning programs, as well as designing and developing summative evaluations to determine the suitability of guiziz platform learning media to be used in learning that is carried out with media, material and language validation. The results of research or data from filling out questionnaires conducted by students can be concluded that the highest percentage of assessments of learning media is 65.5%. From the learning media research, it can be concluded that the quiziz platform development media is feasible to be used as a medium for learning Arabic in Islamic elementary schools.

#### **5. CONCLUSION**

Based on the results of the research that has been done, it can be concluded that the Quiziz Platform Development Learning Media is appropriate for use in learning. The use of this learning media aims to be able to motivate students as well as a media for evaluating student learning so that learning objectives can be achieved. From the results of research or filling out questionnaires to 30 students regarding media eligibility validation, material eligibility validation and language eligibility validation, which obtained the highest percentage of 65.5% indicating that the learning media for developing the quiziz platform is feasible for use in learning, which aims so that students are more enthusiastic in learning so that learning can be understood by students, and also as a medium for evaluating students' abilities in learning so that learning objectives are achieved.

### REFERENCES

- [1] Abba, S. I., Hadi, S. J., Sammen, S. Sh., Salih, S. Q., Abdulkadir, R. A., Pham, Q. B., & Yaseen, Z. M. (2020). Evolutionary computational intelligence algorithm coupled with self-tuning predictive model for water quality index determination. *Journal of Hydrology*, 587, 124974. https://doi.org/10.1016/j.jhydrol.2020.124974
- [2] Ahmad, B., Jian, W., & Anwar Ali, Z. (2018). Role of Machine Learning and Data Mining in Internet Security: Standing State with Future Directions. *Journal of Computer Networks and Communications*, 2018, 1–10. https://doi.org/10.1155/2018/6383145
- [3] Ahmed, Z., Nathaniel, S. P., & Shahbaz, M. (2021). The criticality of information and communication technology and human capital in environmental sustainability: Evidence from Latin American and Caribbean countries. *Journal of Cleaner Production, 286, 125529.* https://doi.org/10.1016/j.jclepro.2020.125529
- [4] Alexopoulos, K., Nikolakis, N., & Chryssolouris, G. (2020). Digital twin-driven supervised machine learning for the development of artificial intelligence applications in manufacturing. *International Journal of Computer Integrated Manufacturing*, 33(5), 429–439. https://doi.org/10.1080/0951192X.2020.1747642
- [5] Al-Maroof, R. A. S., & Al-Emran, M. (2018). Students Acceptance of Google Classroom: An Exploratory Study using PLS-SEM Approach. International Journal of Emerging Technologies in Learning (IJET), 13(06), 112. https://doi.org/10.3991/ijet.v13i06.8275
- [6] Arghashi, V., & Yuksel, C. A. (2022). Interactivity, Inspiration, and Perceived Usefulness! How retailers' AR-apps improve consumer engagement through flow. *Journal of Retailing and Consumer Services*, *64*, 102756. https://doi.org/10.1016/j.jretconser.2021.102756
- [7] Awasthi, A., Govindan, K., & Gold, S. (2018). Multi-tier sustainable global supplier selection using a fuzzy AHP-VIKOR based approach. International Journal of Production Economics, 195, 106–117. https://doi.org/10.1016/j.ijpe.2017.10.013
- [8] Bagley, P. L., Dalton, D. W., Eller, C. K., & Harp, N. L. (2021). Preparing students for the future of work: Lessons learned from 382

telecommuting in public accounting. Journal of Accounting Education, 56, 100728. https://doi.org/10.1016/j.jaccedu.2021.100728

- [9] Bai, C., Kusi-Sarpong, S., Badri Ahmadi, H., & Sarkis, J. (2019). Social sustainable supplier evaluation and selection: A group decisionsupport approach. International Journal of Production Research, 57(22), 7046–7067. https://doi.org/10.1080/00207543.2019.1574042
- [10] Balapour, A., Reychav, I., Sabherwal, R., & Azuri, J. (2019). Mobile technology identity and self-efficacy: Implications for the adoption of clinically supported mobile health apps. International Journal of Information Management, 49, 58–68. https://doi.org/10.1016/j.ijinfomgt.2019.03.005
- [11] Bashir, S., Bano, S., Shueb, S., Gul, S., Mir, A. A., Ashraf, R., Shakeela, & Noor, N. (2021). Twitter chirps for Syrian people: Sentiment analysis of tweets related to Syria Chemical Attack. *International Journal of Disaster Risk Reduction*, 62, 102397. https://doi.org/10.1016/j.ijdtr.2021.102397
- [12] Britzolakis, A., Kondylakis, H., & Papadakis, N. (2020). A Review on Lexicon-Based and Machine Learning Political Sentiment Analysis Using Tweets. International Journal of Semantic Computing, 14(04), 517–563. https://doi.org/10.1142/S1793351X20300010
- [13] Cacheda, F., Fernandez, D., Novoa, F. J., & Carneiro, V. (2019). Early Detection of Depression: Social Network Analysis and Random Forest Techniques. *Journal of Medical Internet Research*, 21(6), e12554. https://doi.org/10.2196/12554
- [14] Cai, Y., Wang, B., Wang, Y., Xia, C., Qiao, J., van Aken, P. A., Zhu, B., & Lund, P. (2018). Validating the technological feasibility of yttriastabilized zirconia-based semiconducting-ionic composite in intermediate-temperature solid oxide fuel cells. *Journal of Power Sources*, 384, 318–327. https://doi.org/10.1016/j.jpowsour.2018.03.012
- [15] Chen, I.-H., Chen, C.-Y., Pakpour, A. H., Griffiths, M. D., Lin, C.-Y., Li, X.-D., & Tsang, H. W. H. (2021). Problematic internet-related behaviors mediate the associations between levels of internet engagement and distress among schoolchildren during COVID-19 lockdown: A longitudinal structural equation modeling study. *Journal of Behavioral Addictions*, 10(1), 135–148. https://doi.org/10.1556/2006.2021.00006
- [16] Cheng, J., Chen, W., Tao, F., & Lin, C.-L. (2018). Industrial IoT in 5G environment towards smart manufacturing. Journal of Industrial Information Integration, 10, 10–19. https://doi.org/10.1016/j.jii.2018.04.001
- [17] Chiou, J.-M., Liou, H.-T., & Chen, W.-H. (2021). Modeling Time-Varying Variability and Reliability of Freeway Travel Time Using Functional Principal Component Analysis. IEEE Transactions on Intelligent Transportation Systems, 22(1), 257–266. https://doi.org/10.1109/TITS.2019.2956090
- [18] Dick, G., & Yagmur Akbulut, A. (2020). Innovative Use of the ERPsim Game in A Management Decision Making Class: An Empirical Study. Journal of Information Technology Education: Research, 19, 615–637. https://doi.org/10.28945/4632
- [19] Eiter, T., Kaminski, T., Redl, C., & Weinzierl, A. (2018). Exploiting Partial Assignments for Efficient Evaluation of Answer Set Programs with External Source Access. *Journal of Artificial Intelligence Research*, *62*, 665–727. https://doi.org/10.1613/jair.1.11221
- [20] Follana-Berná, G., Palmer, M., Lekanda-Guarrotxena, A., Grau, A., & Arechavala-Lopez, P. (2020). Fish density estimation using unbaited cameras: Accounting for environmental-dependent detectability. *Journal of Experimental Marine Biology and Ecology*, 527, 151376. https://doi.org/10.1016/j.jembe.2020.151376
- [21] Fuad, A. J., & Khusna, K. (2022). Development of Quizizz Media for Online Learning for Class IV English Subjects at Madrasah Ibtidaiyah. *EL Bidayah: Journal of Islamic Elementary Education*, *4*(1), 54–66. https://doi.org/10.33367/jiee.v4i1.2371
- [22] Herman, H., Shara, A. M., Silalahi, T. F., Sherly, S., and Julyanthry, J. (2022). Teachers' Attitude towards Minimum Competency Assessment at Sultan Agung Senior High School in Pematangsiantar, Indonesia. *Journal of Curriculum and Teaching, Vol. 11, No. 2, PP.* 01-14. DOI: https://doi.org/10.5430/jct.v11n2p1
- [23] Herman, Anantadjaya, S. P., Nawangwulan, I. M., Mapilindo, Cakranegara, P. A., Sinlae, A. A. J., & Arifin, A. (2023). Development Application of National Curriculum-Based Learning Outcome Assessment. *Journal of Higher Education Theory and Practice*, 23(2), 69-82. https://doi.org/10.33423/jhetp.v23i2.5809
- [24] Hidayati, I. D., & Aslam, A. (2021). Efektivitas Media Pembelajaran Aplikasi Quizizz Secara Daring Terhadap Perkembangan Kognitif Siswa. Jurnal Pedagogi Dan Pembelajaran, 4(2), 251. https://doi.org/10.23887/jp2.v4i2.37038
- [25] Hwang, J., & Choi, L. (2020). Having fun while receiving rewards?: Exploration of gamification in loyalty programs for consumer loyalty. Journal of Business Research, 106, 365–376. https://doi.org/10.1016/j.jbusres.2019.01.031
- [26] livari, N., Sharma, S., & Ventä-Olkkonen, L. (2020). Digital transformation of everyday life How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? International Journal of Information Management, 55, 102183. https://doi.org/10.1016/j.ijinfomgt.2020.102183
- [27] Jalil Piran, M., Pham, Q.-V., Islam, S. M. R., Cho, S., Bae, B., Suh, D. Y., & Han, Z. (2020). Multimedia communication over cognitive radio networks from QoS/QoE perspective: A comprehensive survey. *Journal of Network and Computer Applications*, 172, 102759. https://doi.org/10.1016/j.jnca.2020.102759
- [28] Jammalamadaka, U., & Tappa, K. (2018). Recent Advances in Biomaterials for 3D Printing and Tissue Engineering. *Journal of Functional Biomaterials*, 9(1), 22. https://doi.org/10.3390/jfb9010022
- [29] Javaid, Mohd., & Haleem, A. (2018). Additive manufacturing applications in orthopaedics: A review. Journal of Clinical Orthopaedics and Trauma, 9(3), 202–206. https://doi.org/10.1016/j.jcot.2018.04.008
- [30] Jin, W., Zhang, H., Liu, S., & Zhang, H. (2019). Technological innovation, environmental regulation, and green total factor efficiency of industrial water resources. *Journal of Cleaner Production*, 211, 61–69. https://doi.org/10.1016/j.jclepro.2018.11.172
- [31] Kim, S., & Kim, S. (2018). Exploring the Determinants of Perceived Risk of Middle East Respiratory Syndrome (MERS) in Korea. International Journal of Environmental Research and Public Health, 15(6), 1168. https://doi.org/10.3390/ijerph15061168
- [32] Laranjo, L., Dunn, A. G., Tong, H. L., Kocaballi, A. B., Chen, J., Bashir, R., Surian, D., Gallego, B., Magrabi, F., Lau, A. Y. S., & Coiera, E. (2018). Conversational agents in healthcare: A systematic review. *Journal of the American Medical Informatics Association*, 25(9), 1248– 1258. https://doi.org/10.1093/jamia/ocy072
- [33] Li, W., Rentemeister, M., Badeda, J., Jöst, D., Schulte, D., & Sauer, D. U. (2020). Digital twin for battery systems: Cloud battery management system with online state-of-charge and state-of-health estimation. *Journal of Energy Storage*, 30, 101557. https://doi.org/10.1016/j.est.2020.101557
- [34] Lyndon, M. P., Cassidy, M. P., Celi, L. A., Hendrik, L., Kim, Y. J., Gomez, N., Baum, N., Bulgarelli, L., Paik, K. E., & Dagan, A. (2018).

Hacking Hackathons: Preparing the next generation for the multidisciplinary world of healthcare technology. International Journal of Medical Informatics, 112, 1–5. https://doi.org/10.1016/j.ijmedinf.2017.12.020

- [35] Mansfield, E. D., & Rudra, N. (2021). Embedded Liberalism in the Digital Era. International Organization, 75(2), 558–585. https://doi.org/10.1017/S0020818320000569
- [36] Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research, 123*, 642–656. https://doi.org/10.1016/j.jbusres.2020.10.033
- [37] McGhin, T., Choo, K.-K. R., Liu, C. Z., & He, D. (2019). Blockchain in healthcare applications: Research challenges and opportunities. *Journal of Network and Computer Applications*, 135, 62–75. https://doi.org/10.1016/j.jnca.2019.02.027
- [38] Melnyk, S. A., Flynn, B. B., & Awaysheh, A. (2018). The best of times and the worst of times: Empirical operations and supply chain management research. International Journal of Production Research, 56(1–2), 164–192. https://doi.org/10.1080/00207543.2017.1391423
- Mohamad, M., Ghazali, N., & Hashim, H. (2018). Secondary School Students' Perceptions on the Use of Google+ towards Improving [39] Writing Skills. International Journal of Emerging Technologies in Learning (IJET), 13(09), ESL 224. https://doi.org/10.3991/ijet.v13i09.8479
- [40] Munthe, B., Herman., Arifin, A., Nugroho, B. S., and Fitriani, E. (2021). Online Student Attendance System Using Android. Journal of Physics: Conference Series. 1933 012048, DOI: <u>https://doi.org/10.1088/1742-6596/1933/1/012048</u>
- [41] Nguyen, V., Boehm, B., & Huang, L. (2019). Determining relevant training data for effort estimation using Window-based COCOMO calibration. *Journal of Systems and Software*, 147, 124–146. https://doi.org/10.1016/j.jss.2018.10.019
- [42] O'Connor, S., Jolliffe, S., Stanmore, E., Renwick, L., & Booth, R. (2018). Social media in nursing and midwifery education: A mixed study systematic review. Journal of Advanced Nursing, 74(10), 2273–2289. https://doi.org/10.1111/jan.13799
- [43] Ritonga, A. W., Ritonga, M., Nurdianto, T., Kustati, M., Rehani, R., Lahmi, A., Yasmadi, Y., & Pahri, P. (2020). E-Learning Process of Maharah Qira'ah in Higher Education during the Covid-19 Pandemic. *International Journal of Higher Education*, 9(6), 227. https://doi.org/10.5430/ijhe.v9n6p227
- [44] Rohmani, N., & Andriani, R. (2021). Correlation between academic self-efficacy and burnout originating from distance learning among nursing students in Indonesia during the coronavirus disease 2019 pandemic. *Journal of Educational Evaluation for Health Professions*, 18, 9. https://doi.org/10.3352/jeehp.2021.18.9
- [45] Salsabila, U. H., Habiba, I. S., Amanah, I. L., Istiqomah, N. A., & Difany, S. (2020). Pemanfaatan Aplikasi Quizizz Sebagai Media Pembelajaran Ditengah Pandemi Pada Siswa SMA. Jurnal Ilmiah Ilmu Terapan Universitas Jambi/JIITUJ, 4(2), 163–173. https://doi.org/10.22437/jiituj.v4i2.11605
- [46] Sederholm, H., Haapalainen, R., & Pusa, T. (2022). Meme layers in the times of pandemic. *International Journal of Education Through Art*, *18*(2), 161–179. https://doi.org/10.1386/eta\_00092\_1
- [47] Shen, T. S., Driscoll, D. A., Islam, W., Bovonratwet, P., Haas, S. B., & Su, E. P. (2021). Modern Internet Search Analytics and Total Joint Arthroplasty: What Are Patients Asking and Reading Online? *The Journal of Arthroplasty*, 36(4), 1224–1231. https://doi.org/10.1016/j.arth.2020.10.024
- [48] Silalahi, D. E., Siallagan, H., Munthe, B., Herman, H. and Sihombing, P. S. R. (2022). Investigating Students' Motivation toward the Use of Zoom Meeting Application as English Learning Media During Covid-19 Pandemic. *Journal of Curriculum and Teaching, 11(5), 41-48*, DOI: 10.5430/jct.v11n5p41
- [49] Song, D., Yang, R., Long, F., & Zhu, A. (2019). Applications of magnetic nanoparticles in surface-enhanced Raman scattering (SERS) detection of environmental pollutants. *Journal of Environmental Sciences*, 80, 14–34. https://doi.org/10.1016/j.jes.2018.07.004
- [50] Sulistyo, W. D., Nafi'ah, U., & Idris, I. (2019). The Development of E-PAS Based on Massive Open Online Courses (MOOC) on Local History Materials. International Journal of Emerging Technologies in Learning (IJET), 14(09), 119. https://doi.org/10.3991/ijet.v14i09.10143
- [51] Tahsien, S. M., Karimipour, H., & Spachos, P. (2020). Machine learning based solutions for security of Internet of Things (IoT): A survey. Journal of Network and Computer Applications, 161, 102630. https://doi.org/10.1016/j.jnca.2020.102630
- [52] Turan, Z., Meral, E., & Sahin, I. F. (2018). The impact of mobile augmented reality in geography education: Achievements, cognitive loads and views of university students. *Journal of Geography in Higher Education*, 42(3), 427–441. https://doi.org/10.1080/03098265.2018.1455174
- [53] Van Thao, N., Herman, Napitupulu, E. R., Hien, N. T., and Pardede, H. (2021). Code-Switching in Learning via Zoom Application: A Study in an EFL Context. Asian ESP Journal, Volume 17 Issue 3.1, March 2021
- [54] West, C. P., Dyrbye, L. N., & Shanafelt, T. D. (2018). Physician burnout: Contributors, consequences and solutions. Journal of Internal Medicine, 283(6), 516–529. https://doi.org/10.1111/joim.12752
- [55] Xu, L. D., Xu, E. L., & Li, L. (2018). Industry 4.0: State of the art and future trends. International Journal of Production Research, 56(8), 2941–2962. https://doi.org/10.1080/00207543.2018.1444806
- [56] Yaseen, Z. M., Sulaiman, S. O., Deo, R. C., & Chau, K.-W. (2019). An enhanced extreme learning machine model for river flow forecasting: State-of-the-art, practical applications in water resource engineering area and future research direction. *Journal of Hydrology*, 569, 387–408. https://doi.org/10.1016/j.jhydrol.2018.11.069

DOI: https://doi.org/10.15379/ijmst.v10i2.1207

This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (http://creativecommons.org/licenses/by-nc/3.0/), which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited.