Development of the Edpuzzle Platform as an Audio Visual Learning Media for Arabic Language Learning at Madrasah Aliyah

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ABSTRACT

The development of technology is currently growing so rapidly, various applications and online media are becoming increasingly popular to be used as learning media, including Youtube and Edpuzzle which can be used as learning support platforms with interactive, effective and fun video media for students. Arabic language learning with audio visual is needed by madrasah Aliyah students, so that learning is not boring and more interesting. This research aims to develop the Edpuzzle platform as an audio-visual learning media for Arabic language learning in madrasah Aliyah. The method used in this research is research and development with the Kemp model. Kemp's model is a learning design model designed in the early part of education aims to provide guidance to learners to think about general problems and learning objectives. The results of this study explain that the Edpuzzle platform can be used as audio-visual learning media in learning Arabic with audio visuals that can facilitate students in learning Arabic online. The conclusion of this research is that the Edpudzzle platform can be used as a learning medium for teachers, especially in Arabic language learning. the limitation of this research is that researchers only conduct research on the Edpudzzle platform for Arabic language learning, for that researchers hope that future researchers can conduct research with the same platform but more explained to support the teaching and learning process in other subjects.

Keywords: *Audio Visual Learning, Learning Media, Platform*

INTRODUCTION

The development of information technology, which is growing rapidly in the current era of globalization, is inevitably affecting the world of education (Kalpokaite & Radivojevic, 2020). Global demands require the world of education to always adjust technological developments to improve the quality of education, especially the adjustment of its use in the world of education, especially in the learning process (Bleiker et al., 2020). KeThe advancement of information and communication technology has changed the way people live, whether in working, socializing, playing or learning (Bikson et al., 2018). In this era, technology enters easily into today's life, including one of them into the field of education (Granić & Marangunić, 2019). The development of technology in education has produced many new ideas to support the learning process (Marquis-Gravel et al., 2019). One of them is the increasing number of learning media ideas thanks to the rapid development of technology (Kanke et al., 2021). According to the Big Indonesian Dictionary (KBBI) technology is a scientific method to achieve practical goals (Dias & Paulo Silva Cunha, 2018) , applied science, 2 means to provide goods necessary for the survival and comfort of human life (Radianti et al., 2020). In the current era, technological development is running very fast.

Technological advances at this time have changed the perspective and lifestyle of the community in carrying out all their activities (Xhelili et al., 2019) . The existence and role of information technology in the education system has brought new developments in both the world of Education (Fan et al., 2018), However, these developments have not been matched by an increase in human resources that determine the success of education in general (Jin et al., 2019). This is more due to the lagging of human resources to utilize technology in the education process (Subhash & Cudney, 2018). The influence of technology on education at this time can be felt.a (Zainuddin et al., 2020). Starting from the availability of various variations of learning media, and new learning models formed from utilizing technological developments (Pham et al., 2020). Starting from the availability of various variations of learning media, and new learning models formed from utilizing technological developments (Tabrizian, 2019). Nowadays, distance and time are not a significant problem to gain knowledge, various applications have been created to facilitate teaching and learning activities for students.

Technological advances have created a global learning environment, which is related to networks that place students in the learning process, surrounded by various learning resources, and electronic learning services, such as cell phones and computers (Jahanbakht et al., 2021). Every technology must have both good and bad effects. The good benefits that can be taken from technological advances are to provide convenience in the field of education, especially one of them is a source of knowledge and reference in learning (Asst. Prof., The Islamia University of Bahawalpur, Pakistan, irshad.hussain@iub.edu.pk et al., 2018), However, in addition to providing good benefits, technological advances can also have a negative impact that can bring students into bad things, so students must be careful in using technology (Hartmann et al., 2019). Information and Communication Technology is a large part of science and technology,

in general, all technologies related to the capture, collection, processing, storage, dissemination, and presentation of information (Dwivedi et al., 2021). When viewed at this time, the development of information technology, especially in Indonesia, is growing rapidly. With the existence of information and communication technology, it can make it easier for students to learn and get the learning information needed from anywhere, anytime, and anywhere (Politeknik Maritim Ami Makassar, Indonesia et al., 2019). With the development of such technology, everything can be done in a short time (Langer et al., 2018). There are several benefits obtained from technological developments, namely student learning will be more effective and interesting, and can also help teachers in delivering material through visual / audio visual media, the use of time will also be more efficient, and the creation of a new atmosphere in the learning process.

Media is a word derived from Latin, namely medius, which literally means middle, intermediary, or introduction (Mirbabaie et al., 2020). More specifically, the definition of media in the teaching and learning process is often defined as graphic, photographic, or electronic tools for capturing, processing, and reorganizing visual or verbal information (Bernacki et al., 2020). Learning media is a message-carrying technology that can be used, for the purposes of student learning, and is also a physical and communication means to convey subject matter (Chen & Yang, 2019). Learning media can be used with the aim of improving the quality of education. Learning media today, is known as an object that is brought into the classroom to help the teaching and learning process of students (Zachos et al., 2018). Learning media is a digital product or service provided by the teacher to students by providing learning content such as text, moving images or animation, video, audio to video games (Dunn & Kennedy, 2019). The use of these digital products and services is expected to be able to help students increase motivation in learning, thinking and understanding of the material taught by the teacher (VanDerSchaaf et al., 2022). One of the media that can be used is Edpuzzle-based learning media (Jimenez et al., 2021). The use of computer-assisted learning media can increase the attractiveness of students to learn from their abilities and what is taught (Papadakis et al., 2018). The use of learning media can save teachers' teaching preparation time, and also increase students' enthusiasm for learning, and eliminate students' misunderstandings in listening to the teacher's explanation (Aduba & Mayowa-Adebara, 2022). Therefore, the use of learning media is very important in the student learning process.

Media is a source of learning, so in large terms the media can be interpreted as people, objects, or events that allow students to gain knowledge and skills (Thompson et al., 2022). Educational media or learning media can grow, and develop in accordance with the development of learning technology. the essence of learning media is that: 1. Forms of media used to convey messages or learning 2. Various types of components in the learning environment that can increase learners to learn students 3. Forms of physical tools that can convey messages, as well as provoke students to learn 4. Forms of communication that can improve learning in learning, both printed and through

audio, visual and audio visual (Anderson et al., 2018). Gerlach and Ely say that media when understood broadly are people, materials, or events that build conditions that make students able to acquire knowledge, skills, or attitudes (Lai & Mafas, 2022). In this sense, teachers, textbooks, and the school environment are media (Boulianne et al., 2020). and more specifically, the definition of media in the learning process is often interpreted as graphic, photographic, or electronic tools to capture, respond, process, and compile visual and verbal information.

Edpuzzle is one of the applications that provides a variety of videos as learning media (Almobarraz, 2018). Videos that have their own learning materials taken from videos, YouTube, and even videos made by the teacher himself. Edpuzzle is a media that can help students and teachers to select learning videos, then edit, cut, record sound and also add questions (Shelby & Fralish, 2021). With the Edpuzzle app, video viewing and learning activities for students are more interactive and actively engage students (P. Li et al., 2018). Edpuzzle is an interactive video-based learning media, which allows educators to modify or change learning videos for students (Mayer, 2019). Some interesting things in Edpuzzle are: 1.teachers can see student activeness One of the features contained in Edpuzzle is reinforce accountability, meaning that teachers can see how many videos can be used as learning materials, and accessed by their students and the extent to which these students can understand the material conveyed through videos (Orcos Palma et al., 2018). This shows how active the student is in the subject. 2.Having a large selection of subject areas If you have an Edpuzzle account, you can view videos from a wide variety of subject areas. Such as science, history, and math (Avila-Pesantez et al., 2019). 3.Can be used in various devices Edpuzzle application, and can also be used in a variety of devices, making it very easy for students to access anywhere and anytime (Pulukuri & Abrams, 2020). 4.Integrated with google classroom This application already has additional features, which make it possible to interlink directly with google classroom (Hagge, 2021). Of course this will make it easier for teachers to monitor their students' activities.

The same research was also conducted by (Syarif Hidayat et al., 2021) stated in his research entitled "the application of google classroom and edpuzzle platforms to increase learning independence and student learning outcomes in distance learning on Islamic history material". Said that this research was motivated by the low learning independence and student learning outcomes in teaching and learning activities of Islamic Religious Education in distance learning. Based on preliminary studies, it is known that there are still around 40 percent on average for each class, students who do not participate in learning activities. In the end-of-semester assessment, it is known that there are still 50.43 percent of students who score below the KKM. This study aims to describe the application of the google classroom platform and edpuzzle in PAI subjects. The research approach used is a type of quantitative experimental research in the form of a pseudo-experimental model with a nonequivalent pre-test and post-test control group design. The population of this study was class XI IPA SMAN 4 Sukabumi and the research sample was class XI IPA 5 experimental group and class XI IPA 4 control

group. The research instruments used were 45 questionnaires, 25 item tests, observation, interviews and documentation. Data were analyzed using statistical tests. The results showed that the implementation of google classroom platform and edpuzzle can be implemented well according to the stages of learning planning.

This research was also conducted by (Murtalib & Gunawan, 2022) stated in his research entitled "Responsiveness of Mathematics Students Using Interactive Videos Assisted by Edpuzzle in Online Lectures" said that the obstacles experienced by researchers when students watch lecture material in the form of videos on YouTube, lecturers cannot control student activity when watching videos whether students have really watched the learning material delivered through videos. One of the online learning media platforms that can control student activity when observing learning videos is edpuzzle. Edpuzzle is an online learning media based on interactive videos so that lecturers can modify learning videos themselves and can control student activities when watching learning videos in detail such as the duration of student completeness watching videos, knowing the statistics of solving questions done by students. The purpose of this study was to describe student responses using interactive learning videos assisted by Edpuzzle. The research method used is quantitative descriptive research using a questionnaire as an instrument. Based on the results of the study, it was concluded that the response of mathematics students using interactive videos assisted by edpuzzle in online lectures was very positive at 88.61%.

This research was also conducted by Heistyka & Malasari, (2022) Risma Heistyka stated in her research entitled "learning mathematics integrated with Islamic values using edpuzzle assisted by google classroom on students' interest in learning mathematics" said that the results in this study indicate that in general student interest in learning mathematics using Edpuzzle based on the results of the answers of class VIII students at one of the Madrasah Tsanawiyah in Kudus Regency is in the medium interest category. The fulfillment of all indicators of student interest in learning determines how students' interest in learning after using Edpuzzle as a mathematics learning media, be it indicators of feelings of pleasure, indicators of attention, indicators of interest and indicators of involvement. It can be concluded that Edpuzzle can be an alternative learning media in mathematics learning that is integrated with Islamic values to foster student interest in learning.

The reason I chose this title, because for the development of the edpuzzle platform as an audio-visual learning media for Arabic at Madrasah Aliyah with the Kemp model. it is hoped that students can make the best use of this Arabic learning media, so that learning objectives are achieved. The development of this edpuzzle platform is appropriate for use, and can be considered for its existence to help the Arabic language learning process at Madrasah Aliyah. and also to make it easier for students to understand, and understand audio-visual learning with Arabic. From the explanation above, it can be concluded that there is a need for a problem of learning Arabic in Madrasah Aliyah. researchers hope that with this research, students and Arabic teachers are greatly helped in the Arabic learning process at the school.

METHODE

The Edpuzzle platform application is an application that can support teachers in selecting videos, editing, cropping, recording sound and adding questions. Through the use of EdPuzzle, video viewing activities can be made more interactive and use active student participation (Silverajah & Govindaraj, 2018). Edpuzzle is a video-based learning media application, which can be used by all teachers to make lessons as interesting as possible (Alvarez et al., 2021), videos can be taken via Youtube, then the video is inserted into the edpuzzle application and the teacher can ask questions, and see if the students watch the video given and how much the students understand the material given (Cesare et al., 2021). This application can help teachers in the learning process of Arabic, and also as a medium for student evaluation. This application is also equipped with interesting videos so that young learning is understood by students, so that learning objectives are achieved.

This research uses the Kemp model, which consists of 8 components, namely: 1. Determining topics and general instructional objectives (goals, topics, and general purpose) 2. Analyzing learner characteristics (learner characteristics) 3. Learning objectives (learning objectives) 4. Determining the content of the material (subject content) 5. Establishing initial teaching (pre-assessment) 6. Teaching/learning activities resources, learning resources and learning media that are appropriate, efficient, economical, practical and easy to obtain around 7. Supporting facilities (support service) 8 (X. Li et al., 2022). Kemp's model is very suitable for use as Arabic learning media, to assist teachers in the Arabic learning process, as well as an evaluation medium to measure students' ability to understand learning. learning media using audio visual is very suitable for use in Madrasah Aliyah, because it is equipped with interesting videos (Thomas et al., 2017), So that learning Arabic is not monotonous and easily understood by students, so that the learning objectives of Arabic can be achieved in accordance with the specified curriculum.

The data collection techniques used by researchers in this media research are as follows: 1. observation, researchers conduct research by not directly coming to the school under study, to observe the Arabic language learning process. But through interviews with Arabic language subject teachers. from these interviews, researchers can see the results of observations of the benefits of the edpuzzle platform as a medium for learning Arabic, which can make Arabic learning media more interesting, and not boring. The interview was conducted with the teacher of MAN 1 Tanah Datar. 2. test identifying feasibility using distributing questionnaires to responders. Consisting of students at MAN 1 Tanah Datar, and the teacher became a responder in the questionnaire studied. This study aims, to determine the response and response of teachers and students to the media developed. In this questionnaire using measurement with the answer model "Strongly agree, agree, disagree, and strongly disagree.

This research uses the Kemp model which has eight components or steps described in the table below.

Table 1. components and steps of research

Stage	Component	Activity
Determine topic and general instructional objectives (goals, topic and general purpose)	1	Understand and know the learning materials regarding listening skills
Analyzing learner characteristics	2	Analyze learners' ability to speak
Learning objectives	3	Determine learning materials, strategies, media, and evaluation to determine learning
Determine subject content	4	Designing lesson materials that match the subject matter of the lesson
Determining pre-assessment	5	Knowing the ability of students to follow the listening skills program that has been made
Teaching/learning activities resources	6	Improve teaching and learning activities by using the edpuzzle platform to motivate students to listen
Support service	7	Equipping infrastructure in using the edpuzzle platform to support students' listening skills.
Evaluation	8	Evaluating the results of students' listening skills using the edpuzzle platform

The time and place of this research was conducted at Madrasah Aliyah 1 Tanah Datar, this research was conducted in October 2022. the object of this research is media, language and media validators, as well as the students concerned. As for some of the objects of this research, namely the feasibility of edpuzzle platfrom learning media to see students' abilities in Arabic learning media to improve students' Arabic language learning abilities, and help teachers in the teaching and learning process. The observations made by this researcher were carried out with quantitative methods, namely by making observations through filling out a questionnaire. this quantitative method is also with the percentage results of the questionnaire. Data collection techniques in this study used observation techniques, carried out non-participation, researchers were not at school to examine students in a structured manner while studying at school, or at home, by analyzing conditions before or after the development of the edpuzzle platform, and this questionnaire tested the feasibility of material, media and language.

RESULT AND DISCUSSION

The result of this research is to develop edpuzzle platform learning media as a form of audio visual at Madrasah Aliyah Negri1 Tanah Datar, as Arabic learning media. This media development stage is carried out by analyzing students, by conducting online interviews with related teachers. Then the selection of materials, media and learning methods that are in accordance with the needs of learning, also by making observations through filling out questionnaires to the teachers and students concerned. Then, after knowing the methods, materials and media that are suitable for use in learning, researchers carry out the process of making edpuzzle media platform with media design first. After that, the edpuzzle media platform was assessed in terms of media by media experts, then in terms of language, assessed by Arabic language teachers and material from Arabic language teachers as well. Furthermore, researchers conducted media trials to students as a result of observation, in order to find out whether the media was feasible to apply to learning. The results of the assessment of the edpuzzle platform at Madrasah Aliyah Negri 1 Tanah Datar school in Arabic language learning are as follows:

MEDIA FEASIBILITY VALIDATION SHEET

The results of testing the feasibility of media by media experts, the purpose of this validation is to find out the assessment of media experts, about the shortcomings of the development of the edpuzzle platform made by researchers, as a form of Arabic learning media at the Madrasah Aliyah level. Researchers conducted this media research observation through a questionnaire, also distributed to students. The purpose of this media is to increase students' listening knowledge in learning Arabic, as well as to create cool and fun teaching and learning. The purpose of this assessment is to find out how feasible this media is used in Arabic language learning media at Madrasah Aliyah Negri 1 Tanah Datar. Also to find out the results of the assessment of this media, researchers attach media feasibility validation data from the results of the questionnaire that has been filled in the table below:

Table 2 Media Feasibility Validation Sheet

NO	Assessment Aspect	Strongly Agree	Agree	Disagree	Strongly Disagree	Criteria
1.	Learning media based on edpuzzle platform is very useful	34,4%	65,6%	-	-	agree
2.	The edpuzzle platform is very suitable for Arabic language learning media.	25%	75%	-	-	Agree
3.	The edpuzzle platform is a form of technological development in the world of	46,9%	53,1%	-	-	Agree

	education					
4.	The edpuzzle platfrom really helps students to understand Arabic language learning	34,4%	65,6%	-	-	agree
5.	The edpuzzle platform is very effective in developing Arabic learning media	21,9%	75%	2,9%	-	agree
6.	The edpuzzle platform is an internet that is easily accessible	28,1%	65,6%	6,3%	-	agree
7.	The advantage of the edpuzzle platform is that it is very easy to access anywhere, anytime, and anyone.	40,6%	59,4%	-	-	agree
8.	The edpuzzle platform can be used as a motivation for learning	28,1%	71,9%	-	-	agree
9.	The edpuzzle platfrom makes it easier for students to learn Arabic language	18,8%	81,3%	-	-	agree
10.	Learning objectives can be achieved using the edpuzzle platform	28,1%	71,9%	-	-	agree

Description:

SS = Strongly Agree

S = Agree

TS = Disagree

STS = Strongly Disagree

From the data from the results of observations using a questionnaire on the assessment of the media above, there are percentage results from 32 responders, namely the highest percentage result was obtained as much as 81.3% as the agree category (S). the second highest percentage result is 46.9% as a strongly agree category (ST). The third highest percentage is 6.3% as a category of disagree (TS). And the last or lowest percentage result is 0% as a strongly disagree category (STS). Based on the results of the questionnaire above, which has been filled in by Arabic language experts and

students, the level of quality of the edpuzzle platform learning media is included in the agreed category. So it can be concluded that what is proposed by language expert researchers on edpuzzle platform media says that the results of the media are feasible or appropriate to be developed, or tested in Arabic language learning media at Madrasah Aliyah.

LANGUAGE FEASIBILITY VALIDATION SHEET

Research on the feasibility of language validation, researchers conducted a trial using a questionnaire to language experts, namely to Arabic language teachers, as material to determine the shortcomings of the media that have been made, namely the edpuzzle platform media in the language section. Also carried out an assessment of the students about the language used by the researcher, whether it can be understood by these students or not. For this reason, researchers can find out which language is suitable for use in the media. The purpose of this assessment is to make it easier for students to listen and understand Arabic language learning, as well as to be able to help or facilitate the teacher in the teaching and learning process. To find out the results of the assessment of this language, researchers attach media feasibility validation data from the results of the questionnaire that has been distributed and has been filled in the table below:

Table 3. Language Feasibility Validation Sheet

NO.	Research Aspects	Strongly Agree	Agree	Disagree	Strongly Disagree	Category
1.	Interactive learning media development has the right language structure	28,6%	68,6%	2,9%	-	agree
2.	Development of interactive learning media has effective language	42,9%	57,1%	-	-	Agree
3.	Development of interactive learning media has standardized language	40%	51,4%	8,6%	-	Agree
4.	Development of interactive learning media has the ease of language presentation for students to understand	42,9%	57,1%	-	-	agree
5.	Development of interactive learning media has the suitability of language with students' intellectual development	42,9%	54,3%	2,9%	-	agree

6.	Development of interactive learning media has the suitability of language with the level of emotional development of students	40%	57,1%	2,9%	-	agree
7.	Development of interactive learning media has language accuracy	28,6%	68,6%	2,9%	-	agree
8.	Development of interactive learning media has accuracy of spelling in language	34,3%	65,7%	-	-	agree
9.	Development of interactive learning media has the accuracy of terms in language	34,3%	65,7%	-	-	agree
10.	Development of interactive learning media has the accuracy of commands in language	37,1%	60%	2,9%	-	agree

Description:

SS = Strongly Agree

S = Agree

TS = Disagree

STS = Strongly Disagree

Through the results of observation data using a questionnaire on the assessment of language, there are percentage results from 32 responders, namely the highest percentage result is obtained as much as 68.6% as the percentage category agrees (S). the second highest percentage result is 42.9% as the percentage category strongly agrees (ST). The third highest percentage is 6.8% with the category of disagree (TS), and finally the lowest percentage is 0% as a category of percentage strongly disagree (STS). Based on the results of the data from the questionnaire that has been filled in by linguists and students, the level of quality of the edpuzzle media platform is included in the agreed category. So the conclusion proposed by the Language expert researcher on the edpuzzle media platform says that the learning media is feasible or appropriate to be developed or tested in Arabic language learning media at Madrasah Aliyah.

MATERIAL FEASIBILITY VALIDATION SHEET

Assessment of the feasibility of material validation, researchers conducted a trial using a questionnaire to material experts, namely to Arabic language teachers, as material to find out the shortcomings that exist in the edpuzzle platfrom media, in the material section in accordance with Arabic language learning teaching materials. has also been carried out an assessment of students about the material used by researchers, whether the media material can be understood by students or not. For that researchers can find out the material that is suitable for use in the media. The purpose of this

assessment is to facilitate researchers in making suitable media in Arabic language learning, also to facilitate students in listening to Arabic language learning, and can help teachers in the teaching and learning process. To find out the results of the assessment of the material, the researcher attaches the material feasibility validation data from the results of the questionnaire that has been distributed and filled in the table below:

Table 4. Material Feasibility Validation Sheet

No.	Research Aspects	Strongly Agree	Agree	Disagree	Strongly Disagree	Category
1.	Completeness of interactive learning media material based on edpuzzle platform is appropriate	35,3%	64,7%	-	-	agree
2.	The concepts contained in the interactive learning media material based on the edpuzzle platform are very clear.	29,4%	64,7%	5,9%	-	Agree
3.	The terms contained in the interactive learning media material based on the edpuzzle platform are accurate	29,4%	61,8%	8,8%	-	Agree
4.	Interactive learning media based on edpuzzle platform can be used for a long time.	26,5%	70,6%	2,9%	-	agree
5.	Learning using interactive media is very flexible	32,4%	647,6%	-	-	agree
6.	Interactive learning media based on edpuzzle platform is needed in Arabic language learning	26,5%	70,6%	2,9%	-	agree
7.	The material used in interactive learning media based on edpuzzle platform uses video	23,5%	76,5%	-	-	agree
8.	The material presented can increase students' enthusiasm for learning	20,6%	76,5%	2,9%	-	agree
9.	Interactive learning media material based on edpuzzle platfrom improves	32,4%	67,6%	-	-	agree

|						
	student learning					
10.	The conclusion of the edpuzzle platfrom-based learning media material is very clear	35,3%	64,7%	-	-	agree

Description:

SS = Strongly Agree

S =Agree

TS =Disagree

STS = Strongly Disagree

Through data from the results of observations using a questionnaire on research on material, there are percentage results from 34 respondents, namely the highest percentage result is 76.5% as a percentage category agree (S). the second highest percentage result is 35.3% as a percentage category as strongly agree (SS). The third highest percentage is 8.8% as a category of percentage disagree (TS), and the last or lowest percentage result is 0% as a category of strongly disagree (STS). Based on the results of the data from the questionnaire that has been filled in by material experts and students, the level of quality of the edpuzzle platform learning media is included in the agreed category. So the conclusion proposed by the media expert on the edpuzzle platfrom learning media says that, the learning media is feasible, or appropriate to be developed or also feasible to be tested in the edpuzzle platfrom learning media at Madarasah Aliyah.

Picture of edpuzzle platform
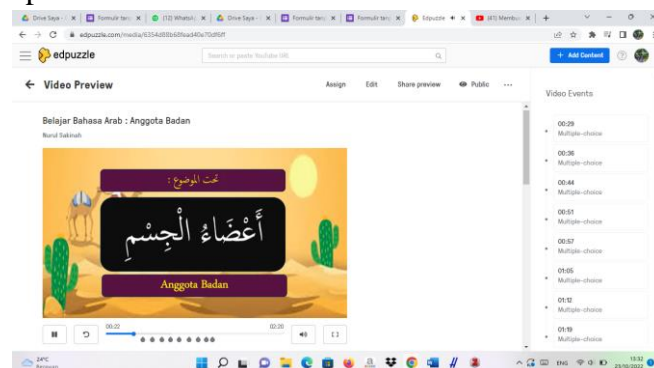
In the picture above, is an example of edpuzzle platform learning media, this media was developed by researchers to assist students in listening to Arabic language learning at Madarasah Aliyah. Also to create a teaching and learning atmosphere that is not boring, more cool and fun because the learning made by researchers is, learning by using electronics or the internet as a learning medium. In addition, it also helps teachers in making materials to teach, which is in accordance with the method or learning style desired by students. The edpuzzle platform learning media can be used in learning media, both in Islamic education, mathematics, and Arabic language subjects. By using this learning media, the objectives of Arabic learning media can be achieved properly and correctly, because students can add knowledge insights to the material being taught.

This research uses the Kemp model or also called Jerol E. Kemp originated from California State University in Sanjose. This kemp learning model is the earliest instructional design model for education. Kemp's model also provides learning to learners, to think about common problems, and also learning objectives. This model also directs teachers to look at the characteristics of the learners and also determine the correct learning objectives. next is to determine the strategy or steps in the teaching and learning process, and also the learning resources that will be used. Furthermore, the material or content is then evaluated on the basis of the objectives that have been formulated. Then developed this learning media by researchers with this Kemp model. this model is a model that is currently developing, which is used in Arabic learning media in accordance with current technological developments.

This model consists of eight components or steps, which are as follows: 1. Determining topics and general instructional objectives (goals, topics, and general purpose) 2. Analyzing learner characteristics (learner characteristics) 3. Learning objectives (learning objectives) 4. Determining the content of the material (subject content) 5. Establishing initial teaching (pre-assessment) 6. Teaching/learning activities resources, learning resources and learning media that are appropriate, efficient, economical, practical and easy to get around 7. This model is very suitable for use in learning Arabic, in order to make it easier for students to listen to Arabic, and also make it easier for teachers in the teaching and learning process, also makes it easier for the teacher to evaluate his students, as well as to be able to create a new learning atmosphere and not boring as usual.

The edpuzzle platform is one of the online learning media that has developed recently, along with the development of technology. Platfrom edpuzzle is a video-like media that provides a variety of interesting features, so that learning does not bore students, and also when listening to the learning media video, students can answer the questions that arise, if the answer is correct then points will appear from the answer, so that students get awards from these results. For this reason, students feel happy in learning Arabic, and the learning process can run smoothly. In addition, this learning media can also help teachers in shaping the materials to be taught, and the media desired by students in learning Arabic. Teachers can make teaching materials not from their own thoughts, but a combination of the thoughts of the teacher and the students. Thus also, the purpose of learning Arabic can run well and correctly.

The results of the development of this research are using edpuzzle platform as a video in Arabic language learning media, to improve the ability and interest of students, and make it easier for teachers to teach. In this study using the Kemp model. The Kemp model is a learning model in the form of an audio-visual video designed at the beginning of education, which aims to guide students in thinking about general problems towards learning objectives. Kemp's learning design model can be used at elementary school, junior high school, high school, madrasah aliyah and also college level. Furthermore, the development of this edpuzzle media platform uses the Kemp

model which has several components or steps. in this model there are eight stages, to find out more clearly the researcher will explain the steps in this study, namely as follows:

First, namely Determining topics and general instructional objectives (goals, topics and general purpose), at this stage, researchers make observations indirectly, but by conducting online interviews with Arabic language subject teachers to find out things related to students. Both in the form of competencies possessed and everything related to students. As it relates to determining topics and learning objectives, namely to find out whether the edpuzzle platform learning media made by researchers is suitable to be determined in the Arabic language learning process. Researchers also made observations by making questionnaires for students as material and also evidence of the success of the media that had been made in the Arabic language learning process. The main purpose of making this learning media is to achieve success in the teaching and learning process.

Second, namely Analyzing learner characteristics (learning characteristics), researchers can analyze the character of these students from observational research, namely by distributing questionnaires and also the contents of the students' answers, as well as the learning styles that students like. Analysis of learner characteristics is one of the efforts made to gain an understanding of the demands, talents, interests, needs and interests of students, which are related to a particular learning program. This stage is necessary considering many considerations such as students, social development, culture, economy, science and technology. The purpose of this learner character analysis is to find out whether the edpuzzle platform learning media made by this researcher is suitable for application at the school. researchers also conducted interviews with Arabic language subject teachers, as material for researchers to find out the abilities of these students.

Third, namely learning objectives, at this stage researchers pay attention to three aspects of competence, namely knowledge, skills, and attitudes, which are specific requirements as a standard for achieving learning objectives. Learning objectives are the direction to be aimed at from a series of activities carried out in the learning process. This can be formulated in the form of specific, actual, and measurable competency behaviors that are expected to occur, owned, or mastered by students after participating in learning activities. The formulation of learning objectives is very important in the series of learning design development. This will later be used as a reference in determining the type of learning material, learning methods, and learning media that will be used in the learning process. Researchers also made observations that must be achieved in learning Arabic.

Fourth, namely Determining the content of the material (subject content), at this step, the researcher applies the edpuzzle media platform at Madrasah Aliyah school and also applies to the teacher to be used as the content of the material also to be taught by the teacher. The determination of the content of this material was also carried out by the researcher by interviewing the Arabic language teacher concerned online, so that the

determination of the content of the material could be in accordance with (SK) competency standards, and (KD) basic competencies that have been arranged by BSNP based on these subjects. With the online interview, the author can make the content of the material with the Arabic teacher at the school concerned, as well as researchers see whether the content of the material made by researchers can be understood by students, by looking at the contents of the questionnaire that has been distributed by researchers. In this case, researchers and teachers need accuracy in choosing and sorting out learning resources, materials, media, and learning procedures that will be used.

Fifth, namely Establishing initial teaching (pre-assessment), in this step, researchers are needed to find out the extent of the initial knowledge of students, in meeting the learning requirements required to follow the learning program to be implemented, thus, teachers and researchers can choose the necessary material without having to present unnecessary ones, so that learning is not monotonous and also the student does not feel bored in learning. Also the edpuzzle video platform developed by this researcher, can increase the enthusiasm for learning of students. And in this step, the implementation of pre-assessment does not always have to be done with a formal concept. For example, the teacher can ask students directly in the classroom, the teacher can ask how many of them have understood the material to be given. That way, learning objectives can be achieved.

Sixth, teaching/learning activities resources, at this stage researchers can explain about the forms of effective teaching and learning activities, and the media that are used as learning resources. In this teaching and learning process, there are three learning alternatives, namely group presentation, individualizer learning, and interaction between teacher and student. In this learning process, you should choose the most effective learning and according to the situation of the students. Learning activities and learning resources that are fun or determine teaching and learning strategies, so students will easily complete the expected goals. with the learning video made by this researcher, it can be used as a good media, and can motivate students to understand the material effectively and illustrate the material. The media that can be used varies, it can be in the form of print media, audio media, visual media, and audio-visual media such as those that researchers make, and can support the teaching and learning process of students.

Seventh, namely supporting facilities (support service), this stage includes supporting facilities such as costs, facilities, equipment, time and others. At this stage, it is very important because facilities are everything that can be used as tools and materials to achieve the goals of learning. These facilities can include classrooms, libraries, toilets, offices, and other infrastructure materials, which motivate learners to learn. With good supporting facilities, it can make the teacher's work easier and faster, so that students can use their time more efficiently. Therefore, it is important to have supporting facilities so that learning activities run smoothly and also provide maximum results. Researchers in conducting this study, use electronic means such as technology that contains learning videos to make it easier for students to learn Arabic, be it in listening or understanding.

Finally eighth, namely Evaluation (evaluation), at this stage, the researcher evaluates student learning on the condition that the students have completed the learning, then the researcher sees the mistakes of the students and reviews the phase of the planning that must be improved. This stage of the evaluation process must be in line with the initial learning objectives. Then the learning objectives will act as a reference for evaluation. This evaluation process, serves to measure the learning outcomes of students, but also serves to measure the level of success of the learning program that has been prepared. Also from this evaluation process, researchers can see the comparison of students who pass and also those who do not pass. If the ratio of students who pass is more than students who do not pass, then the learning is considered successful.

The purpose of this research is to add knowledge insights to students about audio visual Arabic language on videos that have been made by researchers as well as to create a new, fun and not boring learning atmosphere for these students. In addition, it is also a teaching material for teachers, to make it easier for them to teach Arabic. To achieve these goals, researchers used the Kemp model which has several components or steps before applying the learning media created, namely the edpuzzle platform as a learning video. This learning media is very suitable to be applied in learning, one of which is in learning Arabic, because with this learning the participants have enthusiasm in learning Arabic, so that the objectives of learning Arabic can be carried out effectively and efficiently.

CONCLUSION

Based on the results of the research and discussion that has been described, it can be concluded that this research can produce edpuzzle platform learning media as an Arabic language learning medium that is set in Arabic and other subjects. researchers set this media with Arabic language learning to add Arabic vocabulary to Madrasah Aliyah students. Apart from that, it is also a teaching material for teachers so that the learning process can run smoothly. The results of the questionnaire observations that have been distributed to 35 responders on the feasibility of material validation, the feasibility of language validation and the feasibility of media validation, there are the highest data results, namely 81.3% with the category agree (S). so from the results of the questionnaire it can be concluded that, edpuzzle platform as Arabic learning media that is feasible to apply or use in Arabic language learning in Madrasah Aliyah students.

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REFERENCES

Aduba, D. E., & Mayowa-Adebara, O. (2022). Online Platforms Used for Teaching and Learning during the COVID-19 Era: The Case of LIS Students in Delta State University, Abraka. *International Information & Library Review*, *54*(1), 17–31. https://doi.org/10.1080/10572317.2020.1869903

Almobarraz, A. (2018). Utilization of YouTube as an information resource to support university courses. *The Electronic Library*, *36*(1), 71–81. https://doi.org/10.1108/EL-04-2016-0087

Alvarez, J., Del Angel, D., & Martinez, M. (2021). Edpuzzle and Canvas as distance learning tools during the lockdown. *2021 IEEE International Conference on Engineering Veracruz (ICEV)*, 1–6. https://doi.org/10.1109/ICEV52951.2021.9632628

Anderson, J., Chung, Y.-C., & Macleroy, V. (2018). Creative and critical approaches to language learning and digital technology: Findings from a multilingual digital storytelling project. *Language and Education*, *32*(3), 195–211. https://doi.org/10.1080/09500782.2018.1430151

Asst. Prof., The Islamia University of Bahawalpur, Pakistan, irshad.hussain@iub.edu.pk, Hussain, I., Cakir, O., Assoc. Prof., Faculty of Educational Sciences, Ankara University, Turkey, ozlemcak@yahoo.com, Candeğer, Ü., & MEB Ankara, Turkey, gcandeger@gmail.com. (2018). Social Media as a Learning Technology for University Students. *International Journal of Instruction*, *11*(2), 281–299. https://doi.org/10.12973/iji.2018.11219a

Avila-Pesantez, D., Vaca-Cárdenas, M., Miriam Avila P., L., & Vaca-Cárdenas, L. (2019). Application of Web 2.0 Tools in the Pedagogical Process of Mathematics: A Case Study with Students of Basic Education. In K. Arai, R. Bhatia, & S. Kapoor (Eds.), *Intelligent Computing* (Vol. 998, pp. 1097–1116). Springer International Publishing. https://doi.org/10.1007/978-3-030-22868-2_73

Bernacki, M. L., Greene, J. A., & Crompton, H. (2020). Mobile technology, learning, and achievement: Advances in understanding and measuring the role of mobile technology in education. *Contemporary Educational Psychology*, *60*, 101827. https://doi.org/10.1016/j.cedpsych.2019.101827

Bikson, M., Brunoni, A. R., Charvet, L. E., Clark, V. P., Cohen, L. G., Deng, Z.-D., Dmochowski, J., Edwards, D. J., Frohlich, F., Kappenman, E. S., Lim, K. O., Loo, C., Mantovani, A., McMullen, D. P., Parra, L. C., Pearson, M., Richardson, J. D., Rumsey, J. M., Sehatpour, P., … Lisanby, S. H. (2018). Rigor and reproducibility in research with transcranial electrical stimulation: An NIMH-sponsored workshop. *Brain Stimulation*, *11*(3), 465–480. https://doi.org/10.1016/j.brs.2017.12.008

Bleiker, J., Knapp, K., Morgan-Trimmer, S., & Hopkins, S. (2020). What Medical Imaging Professionals Talk About When They Talk About Compassion. *Journal of Medical Imaging and Radiation Sciences*, *51*(4), S44–S52. https://doi.org/10.1016/j.jmir.2020.08.009

Boulianne, S., Lalancette, M., & Ilkiw, D. (2020). "School Strike 4 Climate": Social Media and the International Youth Protest on Climate Change. *Media and Communication*, *8*(2), 208–218. https://doi.org/10.17645/mac.v8i2.2768

Cesare, D. M. D., Kaczorowski, T., & Hashey, A. (2021). A Piece of the (Ed)Puzzle: Using the Edpuzzle Interactive Video Platform to Facilitate Explicit Instruction.

Journal of Special Education Technology, *36*(2), 77–83. https://doi.org/10.1177/0162643421994266

Chen, C.-H., & Yang, Y.-C. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review*, *26*, 71–81. https://doi.org/10.1016/j.edurev.2018.11.001

Dias, D., & Paulo Silva Cunha, J. (2018). Wearable Health Devices—Vital Sign Monitoring, Systems and Technologies. *Sensors*, *18*(8), 2414. https://doi.org/10.3390/s18082414

Dunn, T. J., & Kennedy, M. (2019). Technology Enhanced Learning in higher education; motivations, engagement and academic achievement. *Computers & Education*, *137*, 104–113. https://doi.org/10.1016/j.compedu.2019.04.004

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., … Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, *57*, 101994. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

Fan, L., Zhu, B., Su, P.-C., & He, C. (2018). Nanomaterials and technologies for low temperature solid oxide fuel cells: Recent advances, challenges and opportunities. *Nano Energy*, *45*, 148–176. https://doi.org/10.1016/j.nanoen.2017.12.044

Granić, A., & Marangunić, N. (2019). Technology acceptance model in educational context: A systematic literature review. *British Journal of Educational Technology*, *50*(5), 2572–2593. https://doi.org/10.1111/bjet.12864

Hagge, P. (2021). Student Perceptions of Semester-Long In-Class Virtual Reality: Effectively Using "Google Earth VR" in a Higher Education Classroom. *Journal of Geography in Higher Education*, *45*(3), 342–360. https://doi.org/10.1080/03098265.2020.1827376

Hartmann, N. B., Hüffer, T., Thompson, R. C., Hassellöv, M., Verschoor, A., Daugaard, A. E., Rist, S., Karlsson, T., Brennholt, N., Cole, M., Herrling, M. P., Hess, M. C., Ivleva, N. P., Lusher, A. L., & Wagner, M. (2019). Are We Speaking the Same Language? Recommendations for a Definition and Categorization Framework for Plastic Debris. *Environmental Science & Technology*, *53*(3), 1039–1047. https://doi.org/10.1021/acs.est.8b05297

Heistyka, R., & Malasari, P. N. (2022). PEMBELAJARAN MATEMATIKA TERINTEGRASI NILAI-NILAI ISLAM MENGGUNAKAN EDPUZZLE BERBANTUAN GOOGLE CLASSROOM TERHADAP MINAT BELAJAR MATEMATIKA SISWA. *LINEAR: Journal of Mathematics Education*, *3*(1), 85. https://doi.org/10.32332/linear.v3i1.4827

Jahanbakht, M., Xiang, W., Hanzo, L., & Rahimi Azghadi, M. (2021). Internet of Underwater Things and Big Marine Data Analytics—A Comprehensive Survey. *IEEE Communications Surveys & Tutorials*, *23*(2), 904–956. https://doi.org/10.1109/COMST.2021.3053118

Jimenez, C., Jadraque, M. A., Magreñán Ruiz, Á. A., & Orcos, L. (2021). The use of EdPuzzle to learn polynomial factorization in Secondary Education. *Bordón. Revista de Pedagogía*, *73*(4), 27–42. https://doi.org/10.13042/Bordon.2021.89586

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

Kalpokaite, N., & Radivojevic, I. (2020). Teaching qualitative data analysis software online: A comparison of face-to-face and e-learning ATLAS.ti courses. *International Journal of Research & Method in Education*, *43*(3), 296–310. https://doi.org/10.1080/1743727X.2019.1687666

Kanke, A. A., Morozova, N. I., & Tinyakova, V. I. (2021). Restarting the Education Model in the Digital Economy. In E. G. Popkova, V. N. Ostrovskaya, & A. V. Bogoviz (Eds.), *Socio-economic Systems: Paradigms for the Future* (Vol. 314, pp. 1043–1051). Springer International Publishing. https://doi.org/10.1007/978-3-030-56433-9_109

Lai, S. T., & Mafas, R. (2022). Sentiment Analysis in Healthcare: Motives, Challenges & Opportunities pertaining to Machine Learning. *2022 IEEE International Conference on Distributed Computing and Electrical Circuits and Electronics (ICDCECE)*, 1–4. https://doi.org/10.1109/ICDCECE53908.2022.9792766

Langer, M., König, C. J., & Fitili, A. (2018). Information as a double-edged sword: The role of computer experience and information on applicant reactions towards novel technologies for personnel selection. *Computers in Human Behavior*, *81*, 19–30. https://doi.org/10.1016/j.chb.2017.11.036

Li, P., Wang, D., Wang, L., & Lu, H. (2018). Deep visual tracking: Review and experimental comparison. *Pattern Recognition*, *76*, 323–338. https://doi.org/10.1016/j.patcog.2017.11.007

Li, X., Wang, Y., Jiang, H., Li, Y., Dong, S., Xiang, N., Wang, M., & Liu, S. (2022). Research on Blending Learning Innovation Model of International Logistics Bilingual Course. In Z. Hu, Q. Zhang, S. Petoukhov, & M. He (Eds.), *Advances in Artificial Systems for Logistics Engineering* (Vol. 135, pp. 292–300). Springer International Publishing. https://doi.org/10.1007/978-3-031-04809-8_26

Marquis-Gravel, G., Roe, M. T., Turakhia, M. P., Boden, W., Temple, R., Sharma, A., Hirshberg, B., Slater, P., Craft, N., Stockbridge, N., McDowell, B., Waldstreicher, J., Bourla, A., Bansilal, S., Wong, J. L., Meunier, C., Kassahun, H., Coran, P., Bataille, L., … Peterson, E. D. (2019). Technology-Enabled Clinical Trials: Transforming Medical Evidence Generation. *Circulation*, *140*(17), 1426–1436. https://doi.org/10.1161/CIRCULATIONAHA.119.040798

Mayer, R. E. (2019). Computer Games in Education. *Annual Review of Psychology*, *70*(1), 531–549. https://doi.org/10.1146/annurev-psych-010418-102744

Mirbabaie, M., Bunker, D., Stieglitz, S., Marx, J., & Ehnis, C. (2020). Social media in times of crisis: Learning from Hurricane Harvey for the coronavirus disease 2019 pandemic response. *Journal of Information Technology*, *35*(3), 195–213. https://doi.org/10.1177/0268396220929258

Murtalib, M., & Gunawan, G. (2022). Responsif Mahasiswa Matematika Menggunakan Video Interaktif Berbantuan Edpuzzle dalam Perkuliahan Daring. *DIKSI: Jurnal Kajian Pendidikan Dan Sosial*, *3*(2), 75–84. https://doi.org/10.53299/diksi.v3i2.206

Orcos Palma, L., Blázquez Tobías, P. J., Curto Prieto, M., Molina León, F. J., & Magreñán Ruiz, Á. A. (2018). Use of Kahoot and EdPuzzle by Smartphone in the Classroom: The Design of a Methodological Proposal. In L. Uden, D. Liberona, &

J. Ristvej (Eds.), *Learning Technology for Education Challenges* (Vol. 870, pp. 37–47). Springer International Publishing. https://doi.org/10.1007/978-3-319-95522-3_4

Papadakis, S., Kalogiannakis, M., & Zaranis, N. (2018). Educational apps from the Android Google Play for Greek preschoolers: A systematic review. *Computers & Education*, *116*, 139–160. https://doi.org/10.1016/j.compedu.2017.09.007

Pham, Q.-V., Fang, F., Ha, V. N., Piran, Md. J., Le, M., Le, L. B., Hwang, W.-J., & Ding, Z. (2020). A Survey of Multi-Access Edge Computing in 5G and Beyond: Fundamentals, Technology Integration, and State-of-the-Art. *IEEE Access*, *8*, 116974–117017. https://doi.org/10.1109/ACCESS.2020.3001277

Politeknik Maritim Ami Makassar, Indonesia, Gani*, M., Arsyad, Muh., Politeknik Maritim Ami Makassar, Indonesia, Syariati, St., Politeknik Maritim Ami Makassar, Indonesia, Hadi, A., Politeknik Maritim Ami Makassar, Indonesia, Yusriadi, Y., & Sekolah Tinggi Ilmu Hukum Pengayoman, Makassar, Indonesia. (2019). Success in Management of Student Businesses with Personal Characteristics, Government Assistance and Entrepreneurship Curriculum. *International Journal of Recent Technology and Engineering (IJRTE)*, *8*(3), 7292–7295. https://doi.org/10.35940/ijrte.C6725.098319

Pulukuri, S., & Abrams, B. (2020). Incorporating an Online Interactive Video Platform to Optimize Active Learning and Improve Student Accountability through Educational Videos. *Journal of Chemical Education*, *97*(12), 4505–4514. https://doi.org/10.1021/acs.jchemed.0c00855

Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education*, *147*, 103778. https://doi.org/10.1016/j.compedu.2019.103778

Shelby, S. J., & Fralish, Z. D. (2021). Using Edpuzzle to improve student experience and performance in the biochemistry laboratory. *Biochemistry and Molecular Biology Education*, *49*(4), 529–534. https://doi.org/10.1002/bmb.21494

Silverajah, V. S. G., & Govindaraj, A. (2018). The use of Edpuzzle to support low-achiever's development of self-regulated learning and their learning of chemistry. *Proceedings of the 10th International Conference on Education Technology and Computers - ICETC '18*, 259–263. https://doi.org/10.1145/3290511.3290582

Subhash, S., & Cudney, E. A. (2018). Gamified learning in higher education: A systematic review of the literature. *Computers in Human Behavior*, *87*, 192–206. https://doi.org/10.1016/j.chb.2018.05.028

Syarif Hidayat, E., Umam Bisri, M. R., Basri, H., & A. Heris, H. (2021). PENERAPAN PLATFORM GOOGLE CLASSROOM DAN EDPUZZLE UNTUK MENINGKATKAN KEMANDIRIAN BELAJAR DAN HASIL BELAJAR SISWA DALAM PEMBELAJARAN JARAK JAUH PADA MATERI SEJARAH ISLAM. *Al-Hasanah : Islamic Religious Education Journal*, *6*(2), 254–273. https://doi.org/10.51729/6245

Tabrizian, S. (2019). Technological innovation to achieve sustainable development—Renewable energy technologies diffusion in developing countries. *Sustainable Development*, *27*(3), 537–544. https://doi.org/10.1002/sd.1918

Thomas, T., Dominguez, M., & Ptucha, R. (2017). Deep independent audio-visual affect analysis. *2017 IEEE Global Conference on Signal and Information*

Processing (GlobalSIP), 1417–1421. https://doi.org/10.1109/GlobalSIP.2017.8309195

Thompson, G., Takezawa, N., & Rose, H. (2022). Investigating self-beliefs and success for English medium instruction learners studying finance. *Journal of Education for Business*, *97*(4), 220–227. https://doi.org/10.1080/08832323.2021.1924108

VanDerSchaaf, H. P., Daim, T. U., & Basoglu, N. A. (2022). Factors Influencing Student Information Technology Adoption. *IEEE Transactions on Engineering Management*, 1–13. https://doi.org/10.1109/TEM.2021.3053966

Xhelili, A., Strube, R., Grossi, F., Zvěřinová, I., Taylor, T., Martinez-Juarez, P., Quiroga, S., Suárez, C., & Gjorgjev, D. (2019). A Technological Scenario for a Healthier, More Equitable and Sustainable Europe in 2040 Citizen Perceptions and Policy Implications. *International Journal of Environmental Research and Public Health*, *17*(1), 231. https://doi.org/10.3390/ijerph17010231

Zachos, G., Paraskevopoulou-Kollia, E.-A., & Anagnostopoulos, I. (2018). Social Media Use in Higher Education: A Review. *Education Sciences*, *8*(4), 194. https://doi.org/10.3390/educsci8040194

Zainuddin, Z., Chu, S. K. W., Shujahat, M., & Perera, C. J. (2020). The impact of gamification on learning and instruction: A systematic review of empirical evidence. *Educational Research Review*, *30*, 100326. https://doi.org/10.1016/j.edurev.2020.100326