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Development of Qr-Code Media-Based Modules in Constructing Learning to Increase Learning Motivation

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Abstract: Education plays an important role in preparing the younger generation to face the challenges of the 21st century. One innovation in education is the development of QR-Code media-based modules to increase student learning motivation. QR-Code technology allows teachers to present learning materials in an interactive and interesting way, thus increasing student involvement in the learning process. In addition, QR-Code-based modules also allow easy and practical access for students in learning materials inside and outside the classroom. By utilizing this digital technology, teachers can provide a more engaging and effective learning experience for students, thus supporting the development of 21st century skills required in an ever-evolving world. Therefore, it is important for educators to continue to develop and utilize technology in providing innovative and relevant learning resources for learners.

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Introduction

Education has a strategic role in preparing graduates who qualify according to 21st century skills, which include critical thinking and problem-solving skills, communication and collaborative as well as creativity and discovery. Education is fundamental in shaping the character of each individual. Education is expected to optimize students to become people who have complete competence. Education always strives to improve its consistency in an effort to prepare people needed by society in accordance with the times (Desy et al., 2023).

Education at this time most of the learning is done online or in a network that certainly utilizes digital technology to communicate Online learning is applied at every level of education, from low-level education, namely Early Childhood Education (PAUD) to higher education. The need for learning materials for students is certainly not only from books. Teachers must be able to provide complete learning resources to students to support learning activities at school. Learning is something that is done by someone to find out about something, learning and learning is a process carried out by educators and students to achieve a goal. The nature of learning and learning needs to be studied in depth to find out the boundaries of each of these terms. Learning is an activity carried out by a person through

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processes and experiences to produce a change in behavior that covers cognitive, affective and psychomotor aspects (Aransyah et al, 2023).

However, in the implementation of learning and learning, teachers still play a very active role in providing information related to learning and learning or better known as teacher center learining (TCL). Learning is no longer a doctrine. As stated by Adha, 2012 in Ade Aransyah, 2023. Learning in schools no longer needs to use the doctrine system (influence) but rather the process of providing knowledge and understanding of the postulates or basis of everything known, so that learning in the classroom is nothing more than teaching students how to live. Thus, a learning approach is needed that is able to provide an understanding of the meaning of life and also provide ample space for students to build and develop their mindset.

It should be noted that teachers need to be role models of learning (learner media) for their students. The development of science and technology must be followed by teachers. The era of education that has entered the era of the industrial revolution 4.0 is characterized by the use of digital technology. Therefore, a good teacher must be able to keep up with the times through the use of technology. Thus the learning process takes place quickly, effectively and efficiently without the limits of space and time (Agustini, 2021). The results of the researcher's findings, regarding the implementation of learning and learning History in SMA Class XI, show that students' learning motivation has decreased greatly, the decline in motivation to learn in the field of History studies is known through a questionnaire document that researchers conducted to 10 class XI students, namely as follows:

Table 1. Results of Learning Motivation Needs Analysis

No	Indicator	Percentage
1	Class attendance	50%
2	Active Participation	13%
3	Participation in extracurricular activities	38%
4	Grades and achievements	25%
5	Consistency in learning	25%
6	Have goals and plans	25%
7	Curiosity	38%
8	Seek and utilize assistance	25%
Average		29,6%

Source: Excel data

Based on the data in the table above, it is known that the learning motivation of class VIII students from the distribution of learning motivation questionnaires to 10 students is known to be very low on average with a percentage of 29.6%. The decrease in learning motivation is a problem in achieving learning goals.

The decline in learning motivation is certainly inseparable from the role of the teacher as a facilitator of learning and learning in the classroom, further observations made by researchers found that the decline in student motivation, especially from the methods, media and learning strategies delivered by educators to students. Conventional methods such as recording, listening, and memorizing are no longer considered appropriate with changing times, especially in subjects, the use of digital media in subjects tends not to vary such as simple powerpoint, google classroom, whatshapp. For this reason, researchers are interested in developing learning media to increase student learning motivation, as for the teaching

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materials that researchers will develop, namely in the form of a Qr-Code-based constructivism learning module on material to increase student learning motivation.

The development of the media-based constructivism learning module is certainly inseparable from the development of the 21st century. Technological developments in the current era are advancing very rapidly. Along with the advancement of science and the use of technology. Technology penetrates into various fields, including the field of education. Those who are involved in the world of education must be able to keep pace and follow these technological advances. Not only teachers/lecturers who are technology literate, but students or students must also be able to keep up with technological developments.

Facing the era of industrial revolution 4.0. characterized by a combination of automation technology and cyber technology. The 4.0 revolution embeds smart technology that can connect with various areas of human life, including the world of education. Teachers must be able to use technology in learning at school. Conventional methods have begun to be abandoned. Teachers are no longer the center of learning or Teacher Centered Learning (TCL). They must change and be able to keep up with the times. Methods used in learning such as only using the lecture method must be adapted to learning that is in accordance with the times. With the TCL method, students feel bored and less focused on the learning process. Hence, the learning process is more student-centered or known as Student Centered Learning (SCL). Students are required to be more active. A learner or student-centered approach, the teacher must be able to carry out his role well, the teacher must help students solve problems when students experience difficulties in the learning process (Darwin Effendi, 2019).

Basically, these 21st century competencies have been adapted in the education system in Indonesia through the 2013 Curriculum. In fact, not only the concept of 21st century skills, but Curriculum 2013 also adopts two other main concepts, namely the scientific approach and authentic assessment. The scientific approach is used to familiarize students with the way scientists think and learning is carried out with the 5M procedure, namely: observe, question, explore/collect data, associate and communicate (Yusuf Andrian and Rusman, 2013). For this reason, researchers will develop a QR-Code media-based constructivism learning module.

Teaching modules have an important role to support teachers in designing learning. Teaching modules are made to contain learning tools based on the curriculum to achieve learning objectives. When preparing learning tools that play an important role is the teacher, the teacher will be honed in thinking skills to be able to innovate in teaching modules. Therefore, making teaching modules is a teacher skill that needs to be developed, this is so that later the teacher's teaching techniques in the classroom are more effective, efficient, fun and do not get out of the discussion of indicators to be achieved. The characteristics of the module as teaching material that will be studied independently by students are expected to have an attractive appearance and use simple and easy-to-understand language, so that students are not easily bored. A teaching module can be useful if students can easily use it. The use of teaching modules in teaching and learning activities is not only seen from teacher activities alone, but also involves students actively in the learning process. It is expected that using teaching modules can create an independent learning process by students (Lika Fitriani, Rani Refianti, 2023).

Research conducted by Ade Aransyah, 2023 with the title of developing teaching material modules based on Problem Based Learning Assisted by QR-Code Media to improve Civics Learning Outcomes, getting an effective level of effectiveness with an average value of 0.71 and the efficiency of the time used is quite effective with 90 minutes for 1 meeting, and the teaching material module has enough influence in the teaching and learning process

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with changes in results before and after using the Civics teaching material module with the results of 16,488> 2, 045, 5) the attractiveness of the teaching material module has a very interesting classification with a validation level that is very easy to use by students with an average percentage of 90.3%. Based on this background, this researcher aims to review some literature related to the development of learning module-based qr-code media to increase the learning motivation of 21st century VIII grade students.

Research Methods

This research uses the literarure review method to thoroughly explore the effect of digital game-based learning media to improve the psychomotor abilities of the alpha generation. There are 15 journals used by researchers, most of the research was conducted in Indonesia. The author searches for journals related to the influence of digital game-based learning media to improve the psychomotor abilities of the alpha generation. Journal searches were conducted using Google Scholar, Garuda Portal and Biomedcentral. The articles used used Indonesian and English full-text articles. All journals related to the development of qr-code media based on learning modules to increase learning motivation are then reviewed, analyzed, looking for similarities (compare) and dissimilarities (contrast), doing or criticizing and finally making a summary.

Research Results And Discussion

Research Results

The review held by Hanna Haristah Al Azka, Rina Dwi Setyawati, Ikhram Ulil Albab with the theme of Learning Module development in 2019, this review aims to create a learning module based on SPLDV class VIII content using PMRI methods. This study found an average media practicality of 87.8%, an average learning tool expert validation test score of 86% (very good), and an average material validation test score of 86.25% (very good). Use the posttest to determine how effective it is. To find out whether the learning outcomes of the experimental class are superior to the control class can be done by analyzing the Posttest scores. The learning module with PMRI approach on SPLDV material for class VIII is declared valid, practical, and effective to be used as a mathematics learning tool on the Two-Variable Linear Equation System for class VIII, according to the review that has been done.

A review conducted by Setyorini, Jaenal Arifin in 2018 with the theme "Utilization of QR-Code to Record Student Attendance Data Integrated with the School Management Information System of SMK Mahardika Malang." The review came to the conclusion that thanks to technological advances, the process of recording student attendance no longer needs to be done by hand. Instead, you can use QR codes on student cards to record attendance data. Parents can also monitor their children's behavior through the website address provided, in addition to the school's ability to monitor student discipline through accurate attendance. Black box testing of the system shows that the system can display information about notifications, student lists, student card lists, attendance lists, and attendance recaps that have been recorded by QR codes (Setyorini & Arifin, 2018).

Furthermore, Akhiruddin Pulungan and Alfa Saleh with the theme The use of QR codes in working with the student participation process in the light of versatile applications in 2019, with the results of exploration of the participation framework intended to record student participation that can run well on Android phones, this application can read carefully Qr Code what functions become student participation codes. this attendance application utilizes Android-based Qr Code which processes data using Firebase Realtime. It is developed in the

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Java programming language in Android Studio and runs with a connection to the internet. (Pulungan, 2019).

In 2019, Dian Sugiana and Dedi Muhtadi published the Development of Augmented Reality Type QR Code Learning Devices in the Era of the Industrial Revolution 4.0. Barcodes evolved into this QR Code technology, which only displays vertical lines. Part of the way to realize technological innovation that bids to be incorporated into the field of education, including the creation of learning tools to support a more effective and efficient teaching and learning process, is to use augmented reality technology such as QR codes. By using the smartphones of teachers and students, Augmented Reality-type QR codes can be made more useful for self-development and continue to innovate in line with technological advances. For educators, here are the main advantages of the Augmented Reality QR Code: Can create learning tools that do not use a lot of paper, can create teaching materials that are connected to the internet, and can keep secrets and evaluation media that can be used for student learning. on line. Though this is an advantage for students: They do not need to carry many books, they can study at school or outside of school, and can make good use of new smartphone technology. By using Augmented Reality Type QR Code technology, it is possible to set a new standard for how teachers and students approach learning in the industrial revolution 4.0. (Sugiana, D., and Muhtadi, 2019).

Muhammad Nur Ashar Asnur, Nurming Saleh, and Syukur Saud, 2018. with the theme "QR-Code Utilization as a Foreign Language Learning Tool in Indonesian Universities". The study findings show that increasing the learning stage through the use of QR codes is beneficial. Students can effectively evaluate their work and understand the material thanks to the QR Code. In addition, the test results showed that 64.63 percent of students were in the excellent category. The findings of this review are highly relevant to education, specifically to increase students' motivation to learn foreign languages in higher education settings. (Saleh et al., 2018).

Furthermore Nurhidayah, Firdaus, Nur Amaliah, Nur Atirah, 2021. With the theme Development of E-Modules assisted by QR code in online Learning Biology Subjects Cell material class XI MIA, the results of the study Given the research and development of E-Modules assisted by QR Code, it is concluded that the E-Modules assisted by QR Code in cell material biology subjects developed are valid, simple and appropriate for use in class XI MIA MAN 1 Majene (Nurhidayah et al., 2021).

A review conducted by Amran Yahya, Nur Wahidah Bakri, in 2019. The research title "The Role of the QR Code-Based Teams Games Tournament (TGT) Cooperative Teaching Model on Mathematics Learning Outcomes. After applying the Teams Games Tournament (TGT) type cooperative learning model, this study found that the mathematics learning outcomes of XII AP2 class students of SMK Negeri 1 Tinambung experienced a significant increase of 16.74. Students in class XII AP2 Tinambung learned mathematics using the team games tournament (TGT) cooperative learning method and QR code application with an average of 80.15, mean 79.5, standard deviation 7.2, variance 51.77, and range score 27, with the lowest score being 64 and the highest score being 91 (Yahya & Bakri, 2019).

Furthermore, Risa Mufliha Rsi, 2020, Eva Nurul Candra. Utilization of QR Code as a means of socialization in an effort to make teaching materials for vocational students. The research findings show that the use of QR code-enabled teaching materials improves learning in the classroom. which later educators can use QR codes to communicate teaching materials not only during face-to-face, but also before and after face-to-face learning. This is held so that the learning environment and conditions become more comfortable and enjoyable. As a

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result, students want to concentrate on cultivating their skills while learning rather than worrying about forgetting to complete the assignments that will be given to them in class. In general, students find learning more interesting and rewarding. (Candra et al., 2020).

Nurhayati Mus, Muh Yahya, Elpisah in 2022 with the theme of research results which concluded that the application of augmented reality type Qr-code in improving the learning outcomes of banking students is significant from pre-cycle, cycle I, and cycle II with each percentage of 19%, 38%, and 73%. The use of augmented reality type Qr-code can foster student learning activities. Classical learning activities have been completed in cycle II. From pre-cycle to cycle I and cycle II, the percentage of learning completion is 20 percent, 65.71 percent, and 92.88 percent respectively. Classical learning graduation was achieved in cycle II (Mus et al., 2022).

In addition, Diah Megasari Tyasning and Arini Fadhillah will collaborate in 2020 with the topic of the impact of Qr-Code and Edmodo (QRCE) collaboration on student enthusiasm and learning outcomes on the material of the mole concept in class X SMK Kesehatan Purwokerto in the 2018-19 academic year. The results of the research and analysis conducted showed: 1) Significance score of mole concept material on learning motivation is 0.030, indicating that students who use QRCE collaboration and conventional learning have different learning motivation. 2) The significance score of 0.024 indicates that conventional learning and QRCE collaboration have different effects on student learning outcomes on the mole concept material. (Tanning & Fadhilah, 2020).

Sukmawati and Jamaluddin 2020, with the title "Implementation of Qr-Code Applications at the Pkn Learning Stage". The term "Quick Response" refers to a matrix code or two-dimensional bar code whose contents can be decoded precisely and quickly. Denso Wave, a Japanese company, created the QR Code which was released in 1994. It can store data horizontally and vertically, making it easier for scanners to read than standard barcodes. This approach results in a learning design that is not only more fun but also more practical, user-friendly, and able to reduce paper consumption. (Jamaluddin, 2020).

Furthermore, Guntur Firmansyah, Didik Hariyanto, Rubbin Kurniawan in 2019, with the theme of the impact of QR Code-based teaching materials on learning motivation and basic table tennis skills. Given that, a point can be made from the research. Learning motivation and basic table tennis skills increase dramatically when QR Code-based teaching materials are used. In both groups that actively used the teaching book, there was a significant increase in learning motivation as well as basic table tennis skills. QR Code-based teaching materials can be used as additional learning tools to support the learning stages. (Firmansyah et al., 2019).

Deni Karisma and Melva Zainil in 2020, with the aim of increasing the learning value of grade IV elementary school students by developing learning tools that present QR-code-based data. The results showed: 1) teachers and students responded to the QR code-based data presentation learning tool with an average score of 95% and 88%; 2) teachers and students' responses to the QR code-based data presentation learning tool with an average score of 95% and 88%, respectively; 3) Material experts, linguists, and media experts assessed the QR code-based data presentation learning tool to increase the learning value of grade IV elementary school students as very valid with an overall validator average. rating of 95.41 (Ulfa & Nashrah, 2020).

Furthermore, Hadith M Kaunang Ataji, Agus Susanto, Agil Lepiyanto in 2019 with the theme as a means of learning Biology to class XI students of SMAN 1 Punggur, developing a human reproductive system module based on QR Code Technology and incorporating

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material from the Qur'an and Hadith. The results of the analysis show that the Design Expert has a validity level of 81.30 percent, the Material Expert has a validity level of 92.50 percent, the Qur'an and Hadith Interpretation Expert has a validity level of 88.50 percent, and the small group trial results are 84 percent. modules that incorporate the Qur'an and Hadith into their content about the human reproductive system and are based on QR Code technology are suitable for use by class XI students of SMAN 1 Punggur (Ataji, 2019).

Ade Aransyah, (2023). With the title Problem-based learning-based teaching material module assisted by QR-Code media to improve Civics Learning Outcomes, the development of learning resources as a medium of knowledge in line with changes in the industrial revolution is desired to be able to bridge the problems that arise in the implementation of achieving learning and educational goals. This review aims to analyze, 1) potential and conditions; 2) development stages; 3) characteristics; 4) effectiveness; 5) attractiveness; PBL teaching material modules assisted by Qr-Code media as learning resources that are aligned with learning needs. The research is a Bord and Gall development research using the ADDIE approach. The population of this review amounted to 30 high school students Perintis 1 Bandar Lampung class XII. Research results can be revealed 1) the potential and conditions for developing Civics teaching material modules are proven to have the potential and conditions to be applied at Perintis 1 Bandar Lampung High School, 2) the development of teaching material modules is carried out due to the lack of Civics learning resources and digital media used, 3) the characteristics of this teaching material module are very effective to use because they have instructions for use and are easily accessed by utilizing smartphones connected to the internet for students, 4) the effectiveness of the teaching material module has an effective level of effectiveness with an average score of 0.71 and the efficiency of the time used is quite effective with 90 minutes for 1 meeting, and the teaching material module has sufficient influence in the teaching and learning process with changes in results before and after using the Civics teaching material module with the results of 16,488> 2, 045, 5) the attractiveness of the teaching material module has a very attractive classification with a validation level that is very easy to use by students with an average percentage of 90.3%.

Discussion

In the review conducted by Hanna Haristah Al Azka, Rina Dwi Setyawati, and Ikhram Ulil Albab, the development of SPLDV content-based Learning Modules for grade VIII was carried out using the PMRI method. The results of the validation test showed that this module had an average media practicality of 87.8%, an average learning tool expert validation test score of 86% (very good), and an average material validation test score of 86.25% (very good). This module is declared valid, practical, and effective to be used as a mathematics learning tool on the Two-Variable Linear Equation System in class VIII. To determine the effectiveness of the 8th grade SPLDV Learning Module, it can be done by analyzing the posttest scores. By comparing the posttest results between the experimental class using the learning module with the PMRI approach and the control class using conventional learning methods, it can be seen whether there is a significant increase in learning outcomes in the experimental class. Thus, the use of Learning Modules based on SPLDV content in class VIII with PMRI methods can make a positive contribution to mathematics learning and improve student learning outcomes.

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Conclusions

The development of QR-Code media-based modules in learning has been proven to increase student learning motivation. The results showed that the use of augmented reality type QR-Code and QR-Code collaboration with Edmodo can significantly improve student learning outcomes and student learning motivation. Thus, the development of QR-Code media-based modules in learning history in high school in 2004 can be expected to increase student learning motivation. By utilizing QR-Code technology, students can be actively involved in learning, increase their interest in historical materials, and strengthen their learning skills. This is in line with previous research findings which show that the use of QR-Code technology can have a positive impact on student learning motivation.

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