

## QUICK RESPONSE CODE (QR Code)-ASSISTED INTERACTIVE MEDIA ON VIRUS FOR HIGH SCHOOL STUDENT

Kuni Mawaddah\*, Firda Ama Zulfia\*, Intan Yunanda\*

\* Department of Biology, Universitas Negeri Malang

---

### Article Info

#### *Article history:*

Received Jul 12<sup>th</sup>, 2017

Revised Aug 20<sup>th</sup>, 2017

Accepted Oct 26<sup>th</sup>, 2017

---

#### *Keyword:*

Interactive media,  
QR Code,  
Virus,

---

### ABSTRACT

One of the technological innovations in education is the creation of interactive learning media. QR Code technology can be used to connect between various media. This study aims to develop QR Code-assisted interactive media on virus for high school student. To learn virus as a microscopic, require various media that can visualize well as interactive media that integrated various other media such as media images and video. The integration of various media can be done with the help of QR Code technology. This research method is a 4D development model adapted from Thiagarajan. In this study, we only do research until the design phase because of limited funds and time. The results of research in the form of interactive media product with QR Code assisted with basic competence in SMA X class that is 3.4 analyze the structure, replication and role of virus in life.

Copyright © 2017 Green Technology.  
All rights reserved.

---

### *Corresponding Author:*

Kuni Mawaddah,  
Department of Biology,  
Universitas Negeri Malang  
Jl. Semarang No. 5  
Email:kunimawaddah@gmail.com

---

## 1. INTRODUCTION

The development of Science and Technology in the 21st century resulted in a change of learning paradigm including curriculum, media, and technology changes. One of the demands of 21st century learning is the integration of technology as a learning media for developing learning skills [1]. The shift of 21st century learning paradigm and 21st century competence framework become a foothold in the development of curriculum 2013. Development of curriculum 2013 shows that the learning paradigm must be changed from teacher centered to student centered in order to achieve the objectives formulated under the Law on National Education System Number 20 Year 2003 article 3 that is in the direction The development of the potential of learners to become human beings who believe and cautious to God Almighty, morality, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible [2].

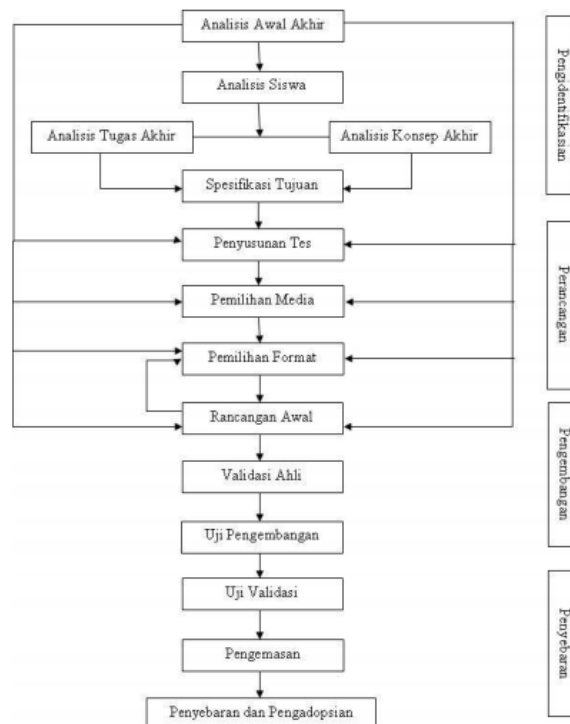
One of the technological developments is the Quick Response (QR) Code. QR Code is another type of barcode. Basically QR Code is developed as a code that allows the code to be translated at high speed. The advantages of the QR Code can store the information horizontally and vertically and containable more information than 1-dimensional barcode [3].

Based on the results of research Rahmat (2015), learning with the help of multimedia can place students as a center (student centered) so that students are more active and experimental in learning. Multimedia learning brings significant effects and benefits for students in improving motivation and learning outcomes [4]. Lee et al (2011) once implemented QR Code in biology learning for high school students in South Korea. Based on the results of his research shows that learning by using QR Code on the phone is able to motivate students' learning effectively than traditional learning [5]. Therefore, the purpose of this research is to develop interactive instructional material of QR Code Virus for High School Class X. The expected result of this instructional material is the students are more motivated in learning and able to learn independently by using technology wisely.

## 2. RESEARCH METHOD

The type of this research is research and development (R&D). This research produces QR Code-assisted interactive learning media that is integrated with video and image media in the form of interactive media

powerpoint macro Virus for SMA Class X. The method used in this research is fou-D model by Thiagarajan include 4 stages namely define, (Design), development (development) and dissemination (disseminate). The stages can be seen in Figure 1.



Gambar 1. 4-D Thiagarajan Model (Source: Trianto, 2010[6])

In this study we only did the early stages namely the definition phase (*define*) and stage design (*design*) because of limited funds and time. Phase definition (*define*) aims to establish and define the learning needs by analyzing objectives and discussion material. The activities in this stage are 1) the beginning-end analysis, 2) student analysis, 3) task analysis, 4) concept analysis, and 5) analysis of learning objectives. The next stage is the stage of design (*design*). At this stage is done learning device design that will be developed that is interactive media. Researchers design the section of interactive media in the form of openers, main menu, introduction, instructions, kd & indicators, materials, evaluation, references, and compilers.

### 3. RESULTS AND ANALYSIS

QR Code-assisted interactive media on virus for high school student. which is integrated with video and images media in the form of interactive media powerpoint macro on virus for High School Class X consists of: (a) opening, (b) the main Menu, (c) instructions manual (d ) KD & learning Indicators, (e) Introduction, (f) Learning materials, (g) Evaluation (h) References, and (i) Compilers. Briefly described as follows:

#### a. Program opening

The program opening section aims to attract students' interest in operating these instructional media so that these impressions contain a variety of interesting and slidesow image of the virus. Figure 2 shows the view of the interactive media program opening



Figure 2 The View of the Interactive Media Program Opening

### b. Main course

The main menu as home so it contains the entire menu of this interactive media. The main menu contains instructions for use, KD & learning indicators, learning materials, evaluations, references, and authors embodied in a particular icon to attract students' attention. Each icon is created linked to make it easy to use. Figure 3 shows the view from the main menu of interactive media.

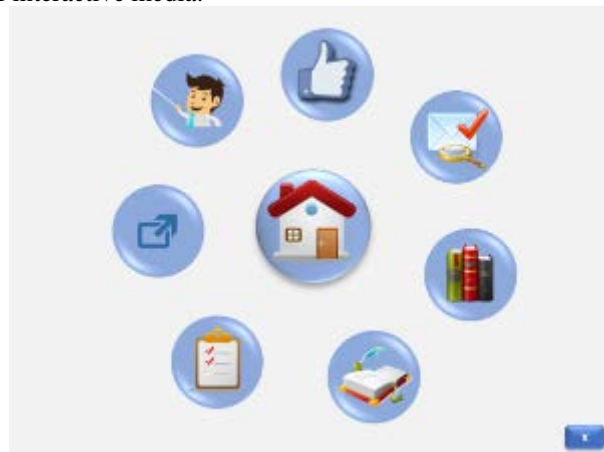


Figure 3 The View of the Main Menu of Interactive Media

### c. Instruction manual

The instruction manual in this interactive medium is divided into 2 sections. The first part is a hint to access the menu by clicking on each menu icon. Figure 4 shows the appearance of the instructions for use of part 1. The second guideline is a guide to the use of QR Code available in the material and evaluation sections that will integrate with other media. The display of instructions for using QR Code can be seen in Figure 5.

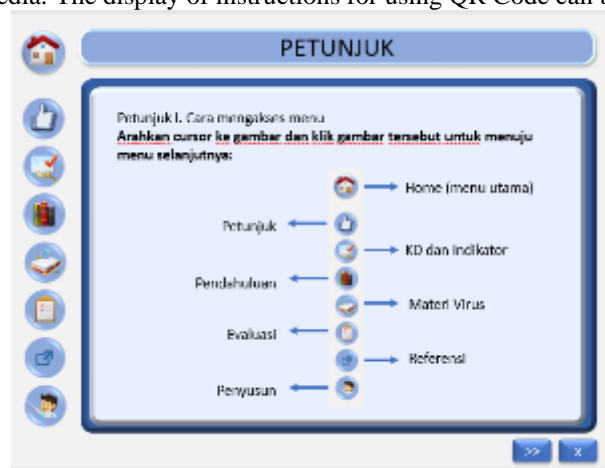


Figure 4 The View of the 1st Instruction Manual

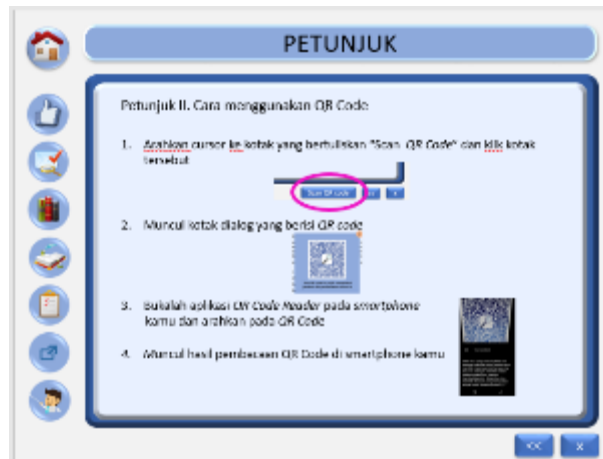


Figure 5 The View of the 2nd Instruction Manual

#### d. KD & learning indicators

KD & learning indicator contains about KD SMA class X that is 3.4 analyze structure, replication and role of virus in life. Learning indicators developed from KD are students able to explain the structure of the virus, explain the structure of the virus and its function, explain the mechanism of viral replication, compare lytic replication and lisogenic virus, and explain the role of virus in life. Figure 6 shows the display of KD & Indicator learning.



Figure 5. The View of the KD & Indicator

#### e. Introduction

The introduction contains apresepsi (initial knowledge) about the virus. This section aims to unearth early knowledge of students about viral material associated with daily life. Figure 7 shows the introduction view.



Figure 7. The View of the Introduction

## f. Learning materials

The learning material contains about nail plant material to be studied namely: virus structure, virus replication cycle, and virus impact to life. Figure 8 shows the main page of matter containing the virus structure, the characteristic features of the virus, viral lytic replication cycle, lysogenic replication cycle of the virus, the virus positive impact and the negative impact of the virus. To access the material is done by clicking the icon. Figure 9 shows one of the material views. In each material displayed also provided a button to access other materials. Making it easier for students to learn as they wish. In the material section found also the QR Code scan button, if the students click on the section will muncul QR Code which if the scan will show the video / other images according to the material but has a higher level of knowledge. Figure 10 shows QR Code display for viral replication litik replication material.



Figure 8. The view of the Material Learning

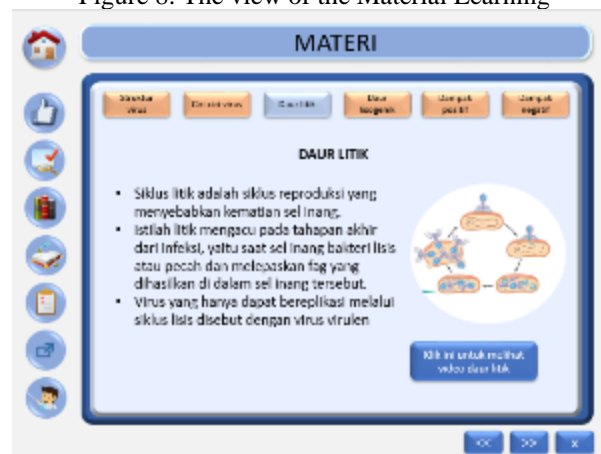


Figure 9. The View of the Virus Replication Lytic Replication Material

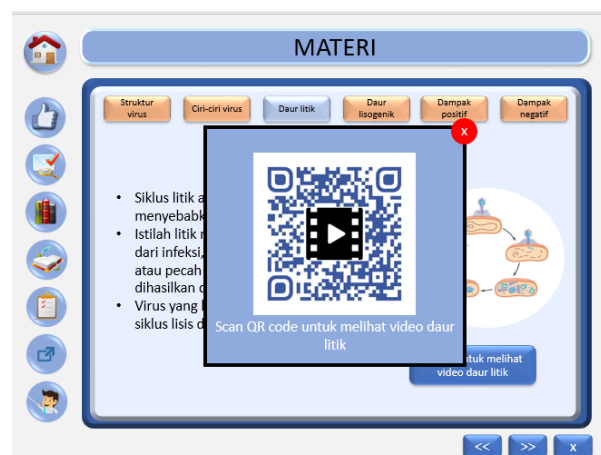


Figure 10. QR Code view for Virus Replication Lytic Replication Material.

### g. Evaluation

Evaluation contains the questions that will be done by students independently. Before filling in the question, there are instructions for writing the name first (see Figure 11). After that, students will fill in the available questions. After all the questions are answered, the student will know the score result. The results of the score also indicate whether the student has been completed or not about the material of this virus so that students can evaluate independently. Each question also provided answers and discussions available in the form of QR Code. Figure 12 shows the results from Scan QR Code that contains answers and discussion of one of the evaluation questions.



Figure 11. The view of Evaluation



Figure 12. Scan QR Code View that Contains the Answers and Discussion of One of the Evaluation Questions.

### h. Reference

References contain a list of points of interest used in the creation of this interactive medium. Figure 13 shows the reference view.

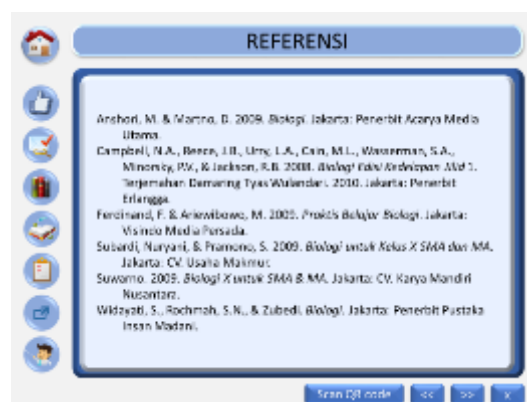


Figure 13. Reference view

### i. Compilers

The compilers of interactive learning media assisted with QR Code viruses are shown in that slide.

Interactive learning media assisted QR Code is a technology-based media that is able to integrate various media into a package of virus material. One of abstract biology subject matter is viral material [7]. Moreover, the demands of Basic Competence 3.4 is to analyze the structure, replication and role of virus in Permendikud number 24 year 2016. So it takes the right media and facilitate students in learning.

This multimedia program is programmed or designed to be used by students individually (self-study). When students apply this program, they are invited to engage audibly, visually, and kinetic, so that with this engagement it is possible that the information or message is easy to understand [8]. Learning independently can be done at home students to support the learning that has been done school. The advantage is that students can construct their own understanding, train critical thinking, and students interact with the learning media used.

The QR Code-assisted interactive media contains guidelines, basic competencies and indicators, introduction, material, evaluation, and cover. Usage instructions aim to enable students to operate interactive media so that they can be used independently. Munir (2008) stated that the advantages of interactive multimedia media are able to give lessons in private through private tutor because this media is able to repeat the information. In addition, the QR Code also help students to access other media through their smartphone [9]. Results QR Code reading on the material is able to provide more knowledge to students and show videos and images that make it easier for students studies while QR Code on the evaluation able to provide answers and discussion of the problems presented. It also helps students in accessing a variety of information that fits easily because the QR Code reader application can be downloaded easily and for free. Saenab et al (2017) conducted a study on the use of QR Code learning system which showed that QR Code is not rigid and flexible in its application[10]. Although QR Code technology has been integrated in learning, the content of learning remains more attention-grabbing when compared to technological factors.

#### 4. CONCLUSION

The teaching materials that resulted from this research are interactive media with QR Code help on virus material. The integration of various media can be done with the help of QR Code technology to make students more interactive with learning media and students can learn independently.

#### REFERENCES

- [1] Yusuf, I., Widyaningsih, S. W., Purwati, D. 2015. Pengembangan Perangkat Pembelajaran Fisika Modern Berbasis Media Laboratorium Virtual berdasarkan Paradigma Pembelajaran Abad 21 dan Kurikulum 2013. *Pancaran*. 4(2): 129-200.
- [2] Hermawan, Hendrik. 2016. *Pengembangan Aplikasi Mobile Learning dalam Pendekatan Project-Based Learning pada Mata Pelajaran SD Negeri 3 Karangasem Kabupaten Grobogan*. Grobogan:UPTD Pendidikan Kecamatan Wirosar
- [3]. David, L. 2007. Ubiquitous Computing. *Emerging Technologies for Learning*. Becta
- [4] Rahmat, S. T. 2015. Pemanfaatan Multimedia Interaktif Berbasis Komputer dalam Pembelajaran. *Jurnal Pendidikan dan Kebudayaan Missio*. 7(2):196-208
- [5] Lee, J., Lee, I., & Kwon, Y. 2011. Scan & Learn! Use of Quick Response Code & Smartphones in a Biology Field Study. *The American Biology Teacher*. 73(8), 485-492.
- [6] Trianto. 2010. *Model Pembelajaran Terpadu*. Jakarta: PT. Bumi Aksara
- [7] Yuniarti, F., Dewi, P., Susanti, R. 2012. Pengembangan Virtual Laboratory sebagai Media Pembelajaran Berbasis Komputes pada Materi Pembiakan Virus. *Unnes Journal of Biology Education*. 1(1): 86-94
- [8] Munadi, Yudhi. 2013. *Media Pembelajaran: Sebuah Pendekatan Baru*. Jakarta: Gaung Persada Press Group
- [9] Munir. 2013. *Multimedia: Konsep dan Aplikasi dalam Pendidikan*. Bandung: Alfabeta.
- [10]. Saenab, S., Syamsiah, Saleh, A. R. 2017. Respon Mahasiswa Terhadap Penggunaan Quick Respon Code (QR Code) pada Matakuliah Botani Tumbuhan Tinggi. *Bionature*. 17(1):58-62