

Development of ANIKOR Learning Media (Animated Coordination System) Biology for Grade XI SMA/MA

Nilu Karinda *, Dwi Kameluh Agustina, Eva Nurul Malahayati

Biology Education Study Program, Faculty of Teacher Training and Education, Balitar Islamic University, Blitar, East Java, Indonesia

*Corresponding Author Email: karindanila@gmail.com

Article Information

Keywords:
Development
ANIKOR Media (Coordination
System Animation)

Kata Kunci:
Pengembangan
Media ANIKOR (Animasi
Sistem Koordinasi)

History:
Received : 01/05/2021
Accepted : 19/10/2021
Published : 29/10/2021

Abstract

Research and development of ANIKOR learning media (Coordination System Animation) aims to determine the feasibility of ANIKOR learning media developed on the coordination system material on the SMA/MA grade XI class. This development research using the Thiagarajan model until the third stage which consists of define (define), design (planning), and develop (development). Data analysis used quantitative and qualitative analysis techniques, while the instruments used were validation questionnaires, readability and response questionnaires. The results of the feasibility test carried out by material experts were stated in the very feasible category, namely 95.44%, media experts in the appropriate category, 78.73%, IT experts in the very feasible category, 92.38%, and language experts in the very feasible category, 85.56%. The readability test of six students obtained 82.22% very feasible category. The results of the response test to the three biology teachers obtained 89.80% very feasible category. Response test to 33 students obtained 82.02% very feasible category. Therefore, ANIKOR learning media is suitable for use in the learning process because it can train students in formulating material conclusions based on their understanding.

Abstrak

Penelitian dan pengembangan media pembelajaran ANIKOR (Animasi Sistem Koordinasi) bertujuan untuk mengetahui kelayakan media pembelajaran ANIKOR yang dikembangkan pada materi sistem koordinasi kelas XI SMA/MA. Penelitian pengembangan ini menggunakan model Thiagarajan sampai tahap ketiga yang terdiri dari *define* (pendefinisian), *design* (perencanaan), dan *develop* (pengembangan). Analisis data menggunakan teknik analisis kuantitatif dan kualitatif, sedangkan instrumen yang digunakan yakni angket validasi, keterbacaan dan angket respon. Hasil uji kelayakan yang dilakukan oleh para ahli materi dinyatakan dalam kategori sangat layak yaitu 95,44%, ahli media kategori layak yaitu 78,73%, ahli IT kategori sangat layak yaitu 92,38%, dan ahli bahasa kategori sangat layak yaitu 85,56%. Uji keterbacaan terhadap enam siswa diperoleh 82.22% kategori sangat layak. Hasil uji respon terhadap tiga guru biologi diperoleh 89.80% kategori sangat layak. Uji respon terhadap 33 siswa diperoleh 82.02% kategori sangat layak. Oleh karena itu, media pembelajaran ANIKOR layak digunakan dalam proses pembelajaran karena dapat melatih siswa dalam merumuskan kesimpulan materi berdasarkan pemahamannya.

© 2021 BIO-INOVED : Jurnal Biologi Inovasi Pendidikan

How to cite: Karinda, N., Agustina, D. K. & Malahayati, E. N. (2021). Development of ANIKOR Learning Media (Animated Coordination System) Biology for Grade XI SMA/MA. *BIO-INOVED : Jurnal Biologi-Inovasi Pendidikan*, 3(3), 204-209.

A. Introduction

Developments in the field of education are programs that are dynamic in nature and can change in keeping with the times. One of the means for individuals to develop their abilities is education (Redhana, 2019). The learning process provided by the teacher can train students in the learning process and acquire skills, knowledge, and attitudes (Ariningtyas et al., 2017). The various educational developments include learning strategies, teaching aids, learning resources, learning media, and curriculum. The 2013 curriculum includes a character and competency-based curriculum only, but also emphasizes aspects of character attitudes (Mulyasa, 2014). Students are expected to understand the material, be active in discussions and presentations and have high manners and discipline.

One alternative that supports the learning process is the use of learning media. According to Agustien (2018), learning media can also be used as part of the task of educators in delivering material to students. Therefore, it is necessary to develop creative and innovative learning media so that it can increase the attractiveness of students to learn. One of the media that is good to use is animated video media (Wahyuni and Sulasmono, 2020). Government Regulation No. 19 of 2005 stipulates that ICT-based facilities must be used in the learning process. This is in line with Arafah's (2018) opinion about ICT-based learning media can also fully serve and meet the needs of students at this time.

Based on the results of observations through the distribution of closed and open questionnaires, about the difficulties and ways to increase the effectiveness of biology learning which will be developed for grade XI SMA/MA. The sample used was 358 from a total population of 842 which was conducted by researchers to grade XII students in five SMA/MA schools in the City and Regency of Blitar, obtained information that, the majority of students stated that the coordination system was the material considered the most difficult to understand with a percentage of 58%. Students also prefer the learning style by seeing and hearing with a percentage of 58% and it is easy to understand biology lessons using media with a percentage of 84.34%. The use of IT-based electronic devices commonly used by students is laptops with a

percentage of 24% and smartphones with a percentage of 35%.

The results of interviews with teachers during initial observations in the learning process tend to have not used learning media and often use the lecture learning method. Biology teachers stated that the material that is difficult to learn and has low learning outcomes is the coordination system. Based on the results of these observations, information was obtained that Biology teachers at schools needed learning media that could facilitate students in understanding the material of the coordination system.

Based on the research results of Nurmaningsih et al. (2013) the development of biological animation media as a learning medium can help students improve academic scores and understand difficult concepts in learning lessons. The results of Fakhri, Muhammad, (2018) research regarding the use of animation learning media obtained information that there was a significant influence on student learning outcomes and this learning media was categorized as a fairly effective learning media. Based on this background, researchers are interested in raising the title of ANIKOR Learning Media Development (Animated Coordination System) Biology for Class XI SMA/MA Students.

B. Material and Method

The method used in this research is a development research approach, and the model used is Thiagarajan which is carried out until the third stage of develop. The population used in this study were all students of grade XII IPA SMA Negeri 1 Garum for the academic year 2019/2020 as many as 5 classes while the research sample taken was grade XII IPA 2 using purposive sampling technique. The instruments used are in the form of a validation questionnaire, readability and response questionnaire which are presented in the following table.

Table 1 Material Expert Questionnaire Grid

Aspect	Indicator
Material eligibility	a. Material Coverage b. Material Accuracy c. Updates and Contextual
Serving eligibility	d. Presentation Support e. Learning Presentation

(Source: adapted from BNSP, 2014)

Table 2 Media Expert Questionnaire Grid

Aspect	Indicator
Audio and visual communication	a. Font accuracy
	b. Font selection accuracy
	c. Image layout and animation
	d. Animated image quality
	e. Animation size accuracy
	f. Animated image color composition
	g. Composition of text color with background color (background)
	h. Clear intro design
	i. Voices and music can be heard clearly
	j. Simple or easy-to-understand learning media display design
	k. Text/writing in learning media is easy to understand
	l. The media display design is quite attractive
	m. Menu color selection or navigation is good
	n. The selection of layout layouts is consistent
Functionality	o. Main navigation menu well
	p. The login menu works fine
	q. The log out menu works fine
	r. Profile menu to see the profile is running well
	s. The menu for the evaluation practice exercise works well
	t. The result of the question score can be seen
	u. Forum menu works fine

(Source: adapted from Hesti, 2016)

Table 3 IT Expert Questionnaire Grid

Aspect	Indicator
Usability seen from the IT field	a. Selected menus can display pages quickly
	b. Search results can be delivered quickly
	c. Websites in learning media can be accessed easily
	d. Easy to remember website address
	e. Content on informative websites
	f. The information presented on the website is up to date

(Source: adapted from Hesti, 2016)

Table 4 Linguistics Questionnaire Grid

Aspect	Indicator
Aspects of language eligibility	a. straightforward
	b. Communicative
	c. Motivating ability
	d. Conformity with Indonesian rules

(Source: adapted from BNSP, 2014)

Table 5 Grid of Teacher and Student Readability Questionnaire

Aspects of assessment	Indicator
Legibility	a. appearance
	b. word convenience level
	c. language
	d. convenience in learn media ANIKOR (Animated Coordination System)

(Source: adapted from BNSP, 2014)

Table 6 Grid of Teacher and Student Response Questionnaires

Criteria	Indicator
Teacher and student responses	a. interest
	b. material
	c. language
	d. convenience

(Source: adapted from Hafidh (2015))

Table 7 Validator Rating Scale, Questionnaire Readability, Teacher and Student Response

No.	Statement	Score
1	Strongly Agree (SS)	5
2	Agree (S)	4
3	Disagree (KS)	3
4	Disagree (TS)	2
5	Strongly Disagree (STS)	1

Sugiono (2011)

Determining the criteria score can be calculated by the following formula.

$$SK = n.p.r$$

Description:

SK = criteria score

n = highest score

p = number of question items

r = number of questions

The percentage of assessment is as follows.

$$P = \frac{\sum X}{\sum XI} \times 100\%$$

Description:

P = perwanted percentage

$\sum X$ = total value of respondents' answers

$\sum XI$ = sum of ideal values

Table 8 Eligibility Level Criteria

Percentage	Category
0% < x 20%	Very unworthy
20% < x 40%	Not feasible
40% < x 60%	Decent enough
60% < x 80%	Worthy
80% < x 100%	Very worth it

(Source: Sugiono, 2011)

Description:

x = percentage result of the assessment appropriateness

C. Results and Discussion

The results of research in SMA/MA District and City Blitar schools at the initial observation stage through interviews and giving questionnaires to teachers to find out the use of media during the learning process in the classroom and to obtain information about student learning outcomes, information was obtained that teachers at the time of learning tended to use less media and often use the lecture learning method as well as material that is difficult to learn and has low learning outcomes is the material of the coordination system. The type of student learning style tends to be liked by seeing and hearing 58%, it is easy to understand Biology lessons using media by 84.34%. In addition, the use of IT-based electronic devices commonly used by students is laptops with 24% and smartphones with 35%.

Based on the results of teacher interviews during learning, they tend to not use learning media and often use the lecture learning method and material that is difficult to learn and has low learning outcomes is the coordination system. While the results obtained from students the percentage of coordination system material that is considered difficult is 58%, the preferred learning style by seeing and hearing is 58%, it is easy to understand biology lessons using media with a percentage of 84.34%, and the use of IT-based electronic devices. which students usually use are laptops with a percentage of 24% and smartphones with a percentage of 35%.

Therefore, researchers developed learning media ANIKOR (Animated Coordination System) for class XI students which makes students not bored while learning and can understand the lesson well. The media created is a web-shaped learning media with design content ranging from student data, KI & KD, learning animations, materials, evaluations, discussions, student profiles, settings and logging out. The product development that has been carried out is then validated by the validators.

The media that has been validated is then tested through a response test and a readability test for the students of SMAN 1 Garum. The class used is class XII IPA 2 with 33 students for the response

test and six students for the readability test. The trial was conducted on 27 August 2020. The trial was not only conducted on students but also on three high school biology teachers. The analysis of the feasibility test and response test has been carried out.

1. Learning media feasibility test

The feasibility test on learning media conducted by researchers aims to be able to produce appropriate and valid learning media based on the assessment of the validators. The characteristics of the media that have been developed by researchers are in the form of learning media ANIKOR (Animated Coordination System). Web-based learning media and can be used on android/smartphones and laptops/personal computers (PCs) by teachers and students online. The display on the teacher contains several toolbar menus including student data, KI & KD, learning animation, material, evaluation, discussion, student profile, settings, and logging out. The display on the students contains several toolbar menus including KI & KD, learning animations, materials, evaluations, discussions, student profiles and logging out.

The development of ANIKOR learning media (Coordinated System Animation) which has been developed by researchers has gone through the validation and revision stages by 12 validators consisting of 3 material experts, 3 media experts, 3 IT experts and 3 linguists. Based on the results of the validation on the assessment carried out by material experts with a percentage of 95.44% with a very feasible category. Media experts indicate a percentage of 78.73% with a decent category. IT experts show a percentage of 92, 38% in the very decent category and language experts show a percentage of 85.56% with a very decent category.

Researchers validated four validators which aimed to find out whether the material, media, IT and language in the learning media were suitable for use in schools because the learning media were made based on IT. After the validation was completed, the researchers conducted limited practicality trials to three biology teachers and six students to test the readability of learning media that can be used on android/smartphones and laptops/personal computers (PCs) online. The readability test was conducted to determine readability. ANIKOR learning media (Animated Coordination System), the aspects stated in the questionnaire include aspects of appearance, level of convenience, language, and convenience in ANIKOR learning media. The results of the teacher's legibility questionnaire are very feasible with a percentage of 91.67%.

Thus, from the results of the validation by experts and the results of the readability questionnaire, the learning media ANIKOR (Animated Coordination System) is considered very good so it can be said that it is feasible to be used as a learning medium by teachers and students. As stated by Astutik and Untari (2021) media that is interesting and makes students not bored in the learning process is animation media, because of animation with a series of pictures or writing in a regular manner so that it can produce images that can move. This is also in line with the opinion of Wahyuningtyas and Sulasmono (2020) that animated video media is one of the best media used by teachers to convey material to students. In addition, according to Wahyuni,

2. Test the response of teachers and students to learning media

Limited trials were not only conducted to determine the readability of learning media, but also conducted response trials to three biology teachers and 33 students. The response test to the ANIKOR learning media (Animated Coordination System) was conducted online. The response test was conducted to determine the response in the ANIKOR learning media. After the teacher and students operated the ANIKOR learning media, the researcher gave a response questionnaire.

The trials carried out aim to find out whether the products that have been made are suitable for use or not and can see the extent to which the products that have been made can reach the right target. The aspects assessed in the response questionnaire include aspects of interest, material, language and convenience. The results of the teacher's response questionnaire were categorized as very feasible with a percentage of 89.80%. The results of the student response questionnaire are very feasible with a percentage of 86.99%.

This is in line with the results of previous research conducted by Khaeruman et al. (2018) which showed that the results of the teacher response trial with a percentage of 80.5%, thus animation learning media is feasible to be used by teachers in learning activities at school. According to Sari (2017) data on student responses to the media for each aspect shows that the media that has been developed is said to be suitable for use in the learning process in schools by 73%, thus the need for the development of interactive animation media that remembers positive responses from respondents. In addition, according to Islamiani, Safitri et al. (2019), students' responses in using animated video media can understand the material and this media is able to make students more enthusiastic so that students' creativity can increase.

D. Conclusion

Based on the results of research and development of learning media products ANIKOR (Animated Coordination System) is feasible to be used as a learning medium. The validation test results from material experts obtained 95.44% or very decent category, media experts got 78.73% (feasible category), IT experts got 92.38% (very feasible category), and language experts 85.56% (very decent category). The results of the teacher's readability test obtained 91.67% or the very feasible category and the student's readability test of 82.22% or the very feasible category. The response test conducted on the teacher was 89.80% (very feasible category) and 86.99% of the students in the very feasible category.

E. Reference

- Agustien, R., Umamah, N., & Sumarno, S. (2018). Pengembangan media pembelajaran video animasi dua dimensi situs Pekauman di Bondowoso dengan model ADDIE mata pelajaran Sejarah kelas X IPS. *Jurnal edukasi*, 5(1), 19-23.
- Arafah, Z. U. (2018). Pengembangan Media Pembelajaran Video Interaktif Berbasis Problem Solving Guna Meningkatkan Minat dan Hasil Belajar Peserta Didik pada Materi Gerak Parabola. *Skripsi*. Yogyakarta: Universitas Negeri Yogyakarta.
- Ariningtyas, A., Wardani, S., & Mahatmanti, W. (2017). Efektivitas lembar kerja siswa bermuatan etnosains materi hidrolisis garam untuk meningkatkan literasi sains siswa sma. *Journal of Innovative Science Education*, 6(2), 186-196.
- Astutik, A. P., Untari, R. S., & Putri, A. M. (2021). Penggunaan Media Animasi "Muroja'ah for Kids" untuk Meningkatkan Hafalan Anak. *Community Empowerment*, 6(4), 682-687.
- BNSP. (2014). *Intrumen Penilaian Buku Teks Pelajaran Tahun 2014*. Jakarta: Badan Standar Nasional Pendidikan.
- Fakhri, M. I., Bektiarso, S., & Supeno, S. (2018). Penggunaan Media Pembelajaran Animasi Berbantuan Macromedia Flash Pada Pembelajaran Fisika Pokok Bahasan Momentum, Impuls, Dan Tumbukan Kelas X Sma. *Jurnal Pembelajaran Fisika*, 7(3), 271-277.
- Khaeruman, K., Ahmadi, A., & Rehanun, R. (2015). Pengembangan Media Animasi Interaktif Pada Materi Laju Reaksi. *Hydrogen: Jurnal Kependidikan Kimia*, 3(1), 267-273.
- Lukitaningrum, Hesti. (2016). Pengembangan Media Pembelajaran Berbasis Web pada Materi Basis Data di Sekolah Menengah Kejuruan

- Kelas XI. *Skripsi*. Yogyakarta: Universitas Negeri Yogyakarta.
- Mulyasa. (2014). *Pengembangan dan Implementasi Kurikulum 2013*. Bandung: Remaja Rosdakarya.
- Nurmaningsih, N., Jekti, D. S. D., & Jamaluddin, J. (2013). Pengembangan Media Animasi Biologi dan Efektivitasnya Terhadap Peningkatan Minat serta Hasil Belajar Siswa SMA Negeri 7 Mataram. *Jurnal Pendidikan Matematika dan Sains*, 1(1), 91-100.
- Redhana, I. W. (2019). Mengembangkan Keterampilan Abad Ke-21 dalam Pembelajaran Kimia. *Jurnal Inovasi Pendidikan Kimia*, 13(1), 2239-2253.
- Safitri, I., Pasaribu, R., Simamora, S. S., & Lubis, K. (2019). The effectiveness of android application as a student aid tool in understanding physics project assignments. *Jurnal Pendidikan IPA Indonesia*, 8(4), 512-520.
- Sari, S. L., Widyanto, A. W., & Kamal, S. (2018). Pengembangan Media Pembelajaran Berbasis Video Animasi dalam Smartphone pada Materi Sistem Kekebalan Tubuh Manusia untuk Siswa Kelas XI di SMA Negeri 5 Banda Aceh. *In Prosiding Biotik* (Vol. 5, No. 1, pp. 476-485). Program Studi Pendidikan Biologi Universitas Islam Negeri Ar-Raniry.
- Sugiyono. (2011). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: CV. Alfabeta.
- Wahyuni, I., Tatang S., & Bambang E. (2019). Pengembangan Lks Digital Berbasis Android Berdasarkan Keanekaragaman Gastropoda Di Hutan Mangrove Pulau Tunda Banten. *Biodidaktika, Jurnal Biologi dan Pembelajarannya*, 14(2), 45-57.
- Wahyuningtyas, R., & Sulasmono, B. S. (2020). Pentingnya Media dalam Pembelajaran Guna Membangkitkan Hasil Belajar di Sekolah Dasar. *Jurnal Ilmu Pendidikan Edukatif*. 2(1), 23-27.