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THE PROPERNESS OF ADOBE FLASH BASIS INTERACTIVE MEDIA FOR *RESPIRATORY SYSTEM* LEARNING MATERIAL

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Abstract

This study aimed to determine the feasibility of adobe flash-based interactive media on material of respiratory system. This research was a descriptive qualitative. The data were validated by using questionnaire. The validation was done by three validators. The aspects of validity were software engineering, instructional design, and visual communication. The average score of validity was 3.28 and it was categorized valid. It is concluded that adobe flash-based interactive media is feasible to be used as a learning media on the material of respiratory system.

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INTRODUCTION

Learning media is an important element to determine the success of learning activities. Learning media is used to deliver a message and stimulate mind, feeling, attention, and interest of students that it will support the learning process in deliberate, intended, and controlled ways Besides, the use of creative media can raise students' interest and talent, learning motivation, as well as accelerate and improve the efficiency of learning (Ali, 2009; Hasrul, 2011; Tabor and Minch, 2013; Arda *et al.*, 2015; Rahayu and Pamelasari, 2015: Tur and Martin, 2015). Moreover, Arda *et al.*, (2015) states that the choice to media should be adjusted with the aim of the learning process which is wanted to be achieved that the main process media as the helping tools for learning can be used maximally.

Human respiratory system learning material is a material of biology which is very close to people's life (Azhari, 2015). In the syllabus of 2013 curriculum, the material of respiratory system contains the description of respiratory organ and the mechanism of respiration for human; the concept of animals' respiratory system contains the materials of respiratory system for invertebrata, fish, frogs, reptile, and birds; and the concept of malfunction and the chapter of diseases to human's breathing organ contains the description of TBC, pneumonia, lungs cancer, asthma, and bronchitis.

Some researches show that one of teachers' attempts to deal with the difficulty of explaining certain concepts or build students' critical thinking as well as their motivation is by using learning media. Utariyanti *et al*. (2015) develops comic book which can be used as a media to teach respiratory system. Rahayu and Pamelasari (2015) apply story telling technique accompanied by puzzle in explaining the materials of energy in human life. Meanwhile, Istiqomah *et al*. (2016) uses media of *kokami* to teach students chemistry for human life. The results of those research showed that the use of media contributes positively to students learning outscome, where Rahayu and Pamelasari (2015) show that there is an improvement of motivation and learning outcome after the application of learning media. Istiqomah *et al*. (2015) also show the improvement of students' critical thinking skills after the use of *kokami* media. In addition, Safriyadi (2016) shows that there is an increasing percentage of students' passing score distribution after the use of pictures for respiratory system learning materials. It should be understood that the development of learning media does not only rely upon visual media (Kosasih and Sumarna, 2013); it can also be an audiovisual media (Wahyuni *et al.*, 2015). Beside that, visual media is not only formed in printed, it can also be formed as an electronic media (Savitri *et al*., 2016).

According to Hendrisakti *et al*. (2013), the presentation of audio visual media can become an interactive media. Interactive media is media which serve recording video containing pictures, texts, and voices controlled by computer, making the students do not only listen, but also see as well as respond the learning process actively. Not only that, Ramansyah (2014) states that through the presentation of text, voice, and picture in a media will make students with different charateristics served well. Previously, Fanny and Suardiman (2013) mentions that the strength of interactive media is not only be used for classical learning, but also for independent learning. The use of learning media with certain direction can make the students in different level able to use that without any difficulty. Besides, the use of interactive media is practical that it uses autorun system and *.exe* file to make it playable in all computers with different specification without installing the file in advance.

Interactive media is surely able to influence students positively for their learning achievement. It is proven by some researches. Susanto *et al*. (2013), states that learning using interactive multimedia can improve students' learning outcome. It also can improve students' learning outcome and motivation (Triyanti, 2015; Yudasmara and Purnami, 2015).

Thus, it can be concluded that the goal of this research is to develop an interactive media

from adobe flash for respiratory system's learning materials.

METHODS

This research was a descriptive qualitative research. The data were collected by the distribution of questionnaire. This research passed several steps, including the creation of media and the analysis of media's validation.

The creation of the media was done based on these steps.

1) The creation of respiratory system learning materials' interactive media used adobe flash CS6 software. The steps of creating the media were:

(a) the creation of storyline. The storyline includes screens' description, descriptive text, the interface, and audio.

(b) the collection of pictures and materials of respiratory system as well as arranging the backsound.

(c) programming the pictures, text, and music based on the storyline.

(d) the finishing, which is the review to the created media. It also includes the evaluation to its readability and playability in an electronic device.

2) Validating interactive media based on adobe flash by 3 validators who become the experts of media as well as the experts of materials.

3) Revising the media based on the suggestions of the validators.

Analysis of the validation result was done by counting the number of validation score. The criteria of validity are referred to Yamasari (2010), where.

$3 \leq RTV_{TK} \leq 4$: Valid

$2 \leq RTV_{TK} < 3$: Fair

$1 \leq RTV_{TK} < 2$: Not Valid

RESULTS AND DISCUSSION

Interactive media from adobe flash was made with the presentation of some menu options: home, direction, core competence/basic competence, materials, exercise, creators, and references (Figure 1. to Figure 6.).

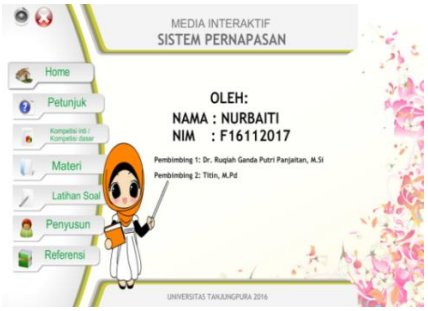

Figure 1. The interface of home page

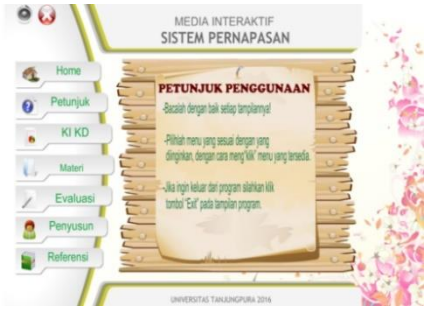

Figure 2. The interface of the direction page

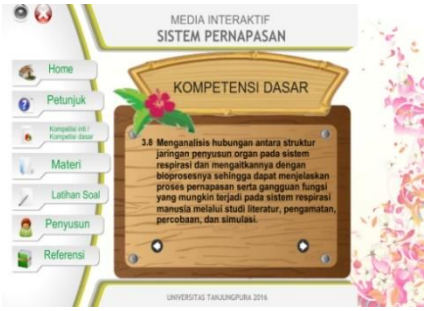

Figure 3. The page of basic competence

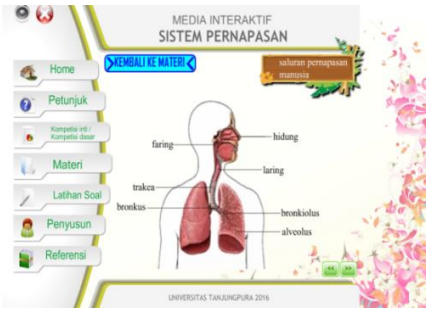

Figure 4. The interface for the materials

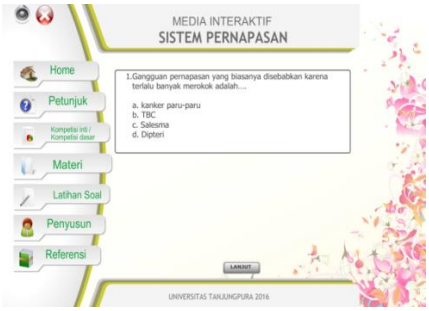

Figure 5. The interface for the exercise page

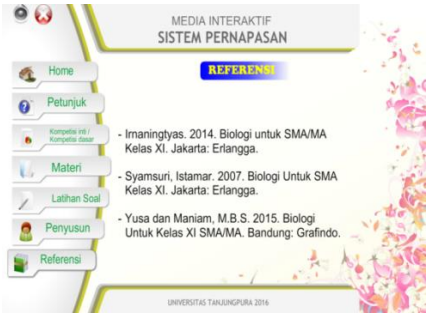

Figure 6. The interface of reference page

The attempt of developing quality learning media needs validation. This process aims to unveil the validity of the media that it will be able to be used properly for the learning process (Fany and Suardiman, 2013; Permana *et al.*, 2016; Savitri *et al.*, 2016; Rusdianti and Linuwih, 2017). The result of the validation can be seen in Table 1**.**

Overall, the validation results showed that the use of adobe flash media is proper for learning process. The contents of the media were the explanation of the mechanism in human's respiratory organs, the functions of the organs, and the diseases which can happen to human's respiratory system. This interactive media was made to provide variative media which can be used for the learning process, specifically for XI grade students.

Related to the scoring of media's properness, the aspects were adjusted to each media. For example, Savitri *et al.* (2016) states that the simplicity, relation between pictures, the emphasis on concept, the use of color, text, and function, as well as the packaging and durability of the e-comic for the scoring. The scoring which is validated by validators includes the software engineering, instructional design, and visual communication.

1) Software engineering

The score of this aspect to the media was shown valid. The size of the file was 29.4 Mb, that it does not need a huge storage space. It is also efficient with short duration.

For the reliability, maintanability, and usability of the media, the score was 2.67 and categorized as fair. It was because the validator saw that the reliability of the media need a trial and error. Somehow, this media did not pass the step. Thus, the aspect became unclearly shown. It is in line to Susanto *et al.* (2013) who state that the readability and readiness of a product needs a trial and error process before its release.

The use of application/ software/ tool was shown valid by using adobe flash. As what Nurtantio and Syarif (2013) say, adobe flash is the proper software to develop an interactive multimedia learning material. Since, it supports the animation, pictures, images, text, and programming really well.

2) Instructional design

The aspect of instructional design consists of seven criteria. Overall, the scoring of validators showed that this media was valid for this aspect. The delivery of materials was right that it was according to the core and basic competence of 2013 curriculum. It is very important that the media is the helping tool for teacher to explain certain concept to students. Furthermore, Yudasmara and Purnami (2015) elaborate that interactive media is mostly used to ease teachers in the learning process to achieve learning goals of certain materials.

Table 1. The Validity of Adobe Flash Interactive Media for Respiratory System Learning Material

Aspects	Criteria	Average Score of Criteria	Averag Score of the Aspects
Software Engineering	1. Effective and Efficient	3.67	3.34
	2. Reliability, maintainability, usability	2.67	
	3. The correctness from the usage of application/software/tools to develop	3.67	
Instructional Design	4. Clarity and Relevance to the goal of Core/Basic Competence	3.67	3.33
	5. Suitability to learning goals	3.67	
	6. Interactivity and Stimulation of learning motivation	3.33	
	7. Materials (depth, systematics, structure, logical flow)	3	
	8. Clarity of explanation and discussion (simulation, exercise)	3.33	
	9. Consistency of evaluation to learning goals	3.33	
	10. The correctness and accuracy to evaluation score	3	
Visual Communication	11. Creativitity of Idea	3	3.17
	12. Simple and Attractive	3.33	
	13. Audio (music)	2.67	
	14. Visual (layout design, typography, color)	3.67	
V_{media}	RTV_{TK}= 3.28 (Valid)		

The scoring interactivity and motivation of students was added by validators to insert students' engagement to the media as an interactive students' worksheet. Moreover, interactive students' worksheet can also motivate students to learn the material deeper. As in Yeni and Yokhebed (2015), by directly involving the learners using interactive media, it will give ppositive impact to students' knowledge.

The adjustment to the main materials of 2013 curriculum showed that it is important to add pictures, since the delivery of materials without pictures will make the learning process boring. Thus, to make the communication of learning happen maximally, the delivery of materials should be structured, clear, and interesting.

For the clarity of explanation, discussion, example, simulation, and exercise, it was considered fairly clear. Somehow, there was a suggestion to show the process of gas exchange from carbon dioxide to oxygen as well as the difference of stomach and chest breathing. By the visualization, the concept of respiratory will be easily understood by students.

It also happens to the consistency of the evaluation with learning goals which should be reviewed. There should be an addition of balance between learning goals and the number of the exercises. It would be better of the evaluation did not focus on the one concept, instead, it should also focus on other concepts. In accordance with Ahdiyah *et al*. (2015), evaluation score should be made to assess students' understanding upon certain concept. Somehow, the evaluation is no less important than the accuracy and correctness of evaluation tools. Evaluation tools will be better if the concept is asked in different delivery in the media (Arda *et al.*, 2015). The scoring of validators to this criterion was there should be

more concern on the deliver of the assessment items, the addition of explanation to every item, and the scoring of every answer. Thus, it was hoped that it would motivate students to learn.

3) Visual Communication

Communication visual consists of four criteria. It showed that this creative media was fairly creative with the addition of animation. Somehow, the animation was considered less attractive to students. The attraction of interest is important, as what is mentioned by Yudasmara and Purnami (2015), that learning process should be able to build interesting learning process as well as able to make the students motivated. Therefore, it will ease the students in understanding the materials.

Based on validators' scoring, the simplicity and attraction to the media was good that the delivery of text, picture, and accessories in every slide was not excessive. The suggestion for this criterion was there should be more translation to text which used English. Safriyadi (2016) explains that the use of learning media should ease the students in understanding the learning materials. Therefore, this media should give some pictures in Indonesian that will ease the students to understand the materials. Moreover, for the audio (background/music), there was a suggestion to clarify the voice of the narrator. It is after Ahdiyah *et al*. (2015) that narrator's voice should be clearly heard which will ease the students to comprehend the materials given by the narrators. Sudjana and Rivai (2013) say that color in a media should be harmonious and not really unclear. According to this statement, the result of validators' scoring showed that the visual (layout design, typography, and color) was correct and clear.

CONCLUSION

This adobe flash interactive media was proper to be used as a learning media for the learning materials of respiratory system.

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REFERENCES

Ahdiyah, A.A.F., Kuswanti, N., & Indana, S. (2015). Pengembangan Media Animasi Pada Materi Sistem Pernapasan Manusia Kelas XI SMA. *Jurnal Bioedu,* 4(3): 918-922.

Ali, M. (2009). Pengembangan Media Pembelajaran Interaktif Mata Kuliah Medan Elektromagnetik. *Jurnal Edukasi @ Elektro,* 5(1): 11-18.

Arda, Saehana. S., & Darsikin. (2015). Pengembangan Media Pembelajaran Interaktif Berbasis Komputer Untuk Siswa SMP Kelas VIII. *e-Jurnal Mitra Sains,* 3(1): 69-77.

Azhari. (2015). Penerapan Model Pembelajaran *Discovery Learning* Terhadap Peningkatan Hasil Belajar Siswa Kelas XI-IPA1 Pada Materi Sistem Pernapasan di SMA Negeri Unggul Sigli. *Jurnal Biologi Edukasi,* 7(1): 13-21.

Fanny, A.M. & Suardiman, S.P. (2013). Pengembangan Multimedia Interaktif Untuk Mata Pelajaran Ilmu Pengetahuan Sosial (IPS) Sekolah Dasar Kelas V. *Jurnal Prima Edukasia,* 1(1): 1-9.

Hasrul. (2011). Desain Media Pembelajaran Animasi Berbasis Adobe Flash CS3 Pada Mata Kuliah Instalasi Listrik 2. *Jurnal Media Edukasi Pendidikan Tinggi dan Kejuaraan,* 3(2): 1-10.

Hendrisakti H., Damris M., & Asrial. (2013). Pengaruh Penggunaan Multimedia Interaktif, Multimedia Non Interaktif dan Minat Belajar Terhadap Kompetensi Kimia Siswa MAN Cendekia Jambi. *Edu-Sains*, 1(2): 19-24.

Istiqomah F., Widiyatmoko, A., & Wusqo, I.U. (2016). Pengaruh Media Kokami Terhadap Ketrampilan Berpikir Kreatif Dan Aktivitas Belajar Tema Bahan Kimia. *Unnes Science Education Journal,* 5(2): 1202-1212.

Kosasih, N. & Sumarna, D. (2013). *Pembelajaran Quantum dan Optimalisasi Kecerdasan*. Bandung: Alfabeta.

Nurtantio, P. & Syarif, A.M. (2013). *Kreasikan Animasimu Dengan Adobe Flash Dalam Membuat Sistem Multimedia Interaktif*. Yogyakarta: Andi.

Permana, N.A., Widiyatmoko, A., & Taufiq, M. (2016). Pengaruh *Virtual Laboratory* Berbasis *Flash Animation* Terhadap

Pemahaman Konsep dan Keterampilan Berpikir Kritis Peserta Didik Tema Optik Kelas VIII SMP. *Unnes Science Education Journal*, 5(3): 1346-1358.

Rahayu, M. & Pamelasari, S.D. (2015). Pengaruh Teknik *Story Telling* Menggunakan Media *Puzzle* Terhadap Motivasi dan Hasil Belajar Siswa SMP Kelas VII Pada Materi Enegi Dalam Sistem Kehidupan. *Unnes Science Education Journal*, 4(3): 959-964.

Ramansyah, W. (2014). Pengembangan Multimedia Pembelajaran Interaktif Berbasis Adobe Flash CS3 Pada Kelas 1 SDN Bancaran 3 Bangkalan. *Jurnal Ilmiah Edutic,* 1(1): 1-11.

Rusdianti, K. & Linuwih, S. (2017). The Development of M-Diagnostic Test to Identify The Understanding Level of Junior High School Students in Temperature Subject. *Unnes Science Education Journal*, 6(1): 1472-1476.

Safriyadi, A. (2016). Pembelajaran Biologi Pokok Bahasan Sistem Pernapasan Pada Manusia Melalui Media Gambar di MTsN Jongar Kabupaten Aceh Tenggara. *Jurnal Biotik*, 4(2): 143-148.

Savitri, E., Panjaitan, R.G.P., & Titin. (2016). Pengembangan Media *E-Comic Bilingual* Sub Materi Saluran dan Kelenjar Pencernaan. *Unnes Science Education Journal*, 5(3):1372-1381.

Sudjana, N & Rivai, A. (2013). *Media Pengajaran.* Bandung: Sinar Baru Algesindo.

Susanto, Dewi, N.R., & Irsadi, A. (2013). Pengembangan Multimedia Interaktif dengan Education Game Pada Pembelajaran IPA Terpadu Tema Cahaya Untuk Siswa Siswa SMP/MTs. *Unnes Science Education Journal,* 2(1): 230-238.

Tabor, S.W. & Minch, R.P. (2013). Student Adoption and Development Digital Learning Media: Action Research and Recommended Practices. *Journal of Information Technology Education: Research*, 2:203-223.

Triyanti, M. (2015). Pengembangan Multimedia Interaktif Pada Materi Sistem Saraf Untuk Meningkatkan Motivasi dan Hasil Belajar Siswa SMA Kelas XI. *Jurnal Bioedukatika*, 3(2): 9-14.

Tur, G. & Martin, V.I. (2015). Enhancing Learning With The Social Media: Student Teachers' Perception on Twitter in a Debate Activity. *New Approaches in Educational Research*, 4(1): 46-53.

Utariyanti, I.F.Z., Wahyuni, S., & Zaenab, S. (2015). Pengembangan Media Pembelajaran Berbasis Komik Dalam Materi Sistem Pernapasan Pada Siswa Kelas VIII MTs. Muhammadiyah 1 Malang. *Jurnal Pendidikan Biologi Indonesia,* 1(3): 343-355.

Wahyuni, T., Widiyatmoko, A. & Akhlis, I. (2015). Efektivitas Penggunaan Media Audiovisual Pada Pembelajaran Energi Dalam Sistem Kehidupan Pada Siswa SMP. *Unnes Science Education Journal*, 4(3): 998-1004.