

# Interactive Media Development Of Natural Sciences' Component To Foster The Inspirational Characters Of Pste Students

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**Abstract:** The background of this research is based on the limited natural sciences' component dictation that helps students to learn individually, so an interactive media is needed to inspire students to develop learning scenarios in primary schools. The research aims to describe the process of developing interactive media of natural sciences' component to foster the inspirational characters of the students. The type of this research is Research and Development (R & D) in Borg and Gall model. The results of this study indicate: (1) The process of developing interactive media includes 9 stages of development namely potential and problems, data collection, product design, design validation, product revision, product testing, product revision II, usage trial, final product. (2) This product is valid, indicated by the excellent category with an average score (3,6) of the material expert's assessment and the average score (3,5) of media expert's assessment as well as the result of the usage trial obtains the improvement of natural sciences learning outcomes of the students, (3) Inspirational characters measured through the process of learning activities and works in developing learning scenarios and worksheets of natural sciences in primary schools show good results with an average score (3.1).

**Index Terms:** inspirational character, interactive media, natural sciences' component

## 1 INTRODUCTION

The efforts to improve the quality of education in welcoming the golden generation of 2045 continue to be made, so educational experts both at the central and regional levels need to review the curriculum and the use of innovative learning media. Carin and Sund (1985: 15) stated that science is a system for knowing nature by collecting data through controlled observations and experiments. So, science is as a collection of knowledge that functions to find out more about natural phenomena through a scientific activity. But in reality, science learning in elementary schools has not yet developed students' thinking skills to solve the problems they face. Science learning should be carried out in scientific inquiry to foster the ability to think, work and behave scientifically and communicate it as an important aspect of life skills. Therefore learning science in elementary schools emphasizes the provision of direct learning experiences through the use and development of scientific process skills and attitudes. (BSNP, 2006: 161). Elementary School Teacher Education students are elementary teacher candidates, in which they must be equipped with how to teach science in elementary schools so that they can produce results that is in accordance with their goal. Science learning is required to be active, innovative, creative, and fun. In order to achieve that we require good and careful planning. One of the good planning is using good learning media. Daryanto (2010: 4) defines that learning media is an intermediary tool in the learning process. Learning media is said to be good if the media looks interesting, interactive, according to their needs and contents easily understood by students. The implementation of science learning should be able to cover the whole nature of science, namely science as a product, as a process, as an attitude and as a technology (Cain and Evans, 1990: 3). Students should be equipped with scientific process skills, namely natural science experiments. However, with the lack of lecture time and the limited teaching materials the students were not be able to experience it fully. So we need Natural Sciences' Components interactive learning media that can inspire students in developing science learning scenarios in elementary school. To overcome this problem, one of the alternatives that is suitable to be developed in science courses is the use of interactive IT-based learning media that can help students to learn. Adobe Flash / Anime CC is one of the computer software used to

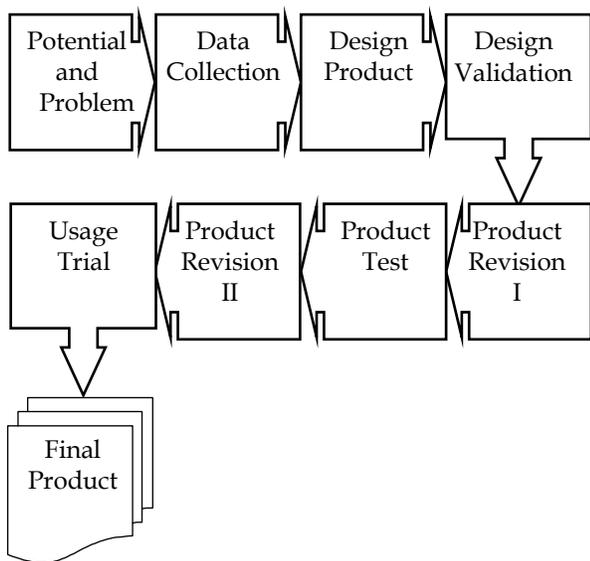
create vector images and animated images. This makes learning media become more varied and not monotonous.

In line with the inauguration of UNNES as a Conservation University declared on March 12, 2010, it has a strategic meaning in the context of character development. UNNES developed 8 values of conservation character that are inspirational, humane, caring, innovative, sportive, creative, honesty, fairness. The character developed at the Faculty of Education (FIP) UNNES is inspirational. Inspirational, is a value reflected in someone who always has an idea to be ready to do something, both intentionally or unintentionally based on ideas that come to the brain in any situation and condition. Inspirational value is reflected in the figure of prospective scholars, both prospective teachers and scientists in their fields (Unnes, 2015). Some of the characteristics of inspirational characters that a teacher needs to have are continuous learning, competent, sincere, spirituality, motivator and creative (<http://www.suarapendukasikita.com/2015/12/t-seven-kistikistik-guruinspiratif.html>). Students as future elementary school teachers must have provisions to become inspirational teachers. From this background the researcher will examine research with the title Interactive Media Development of Natural Sciences' Component to Foster the Inspirational Characters of PSTE Students. Based on the problem background, the problem can be formulated as follows: What is the process of developing interactive learning media development in natural science learning to foster the inspirational character of elementary school teacher students? The research objective is to describe the process of developing interactive learning media in Flash-based science learning to foster the value of inspirational character of elementary school teacher students.

## 2 RESEARCH METHOD

This research used R&D approach with the model developed by Borg and Gall (in Sugiyono, 2015: 35). According to Borg and Gall, "educational and development (R&D) is a process used to develop and validate educational production". The research steps were carried out cyclically, and each step that was carried out refers to the results of the previous steps until a product of development was finally obtained. The steps

were potential and problems, data collection, product design, design validation, product revision I, product trial, product revision II, trial use, final product.



Picture 1 Diagram of Research and Development Model Steps by Sugiyono

The instruments used in obtaining data on this study → there were several data collectors, namely validation sheets, inspirational character assessment sheets, questionnaire sheets, evaluation questions. Data analysis techniques used in this study were qualitative descriptive analysis (Media Validation, Materials, observation sheets and questionnaires) and quantitative analysis (T-Test and Gain).

### 3 RESULT AND EXPLANATION

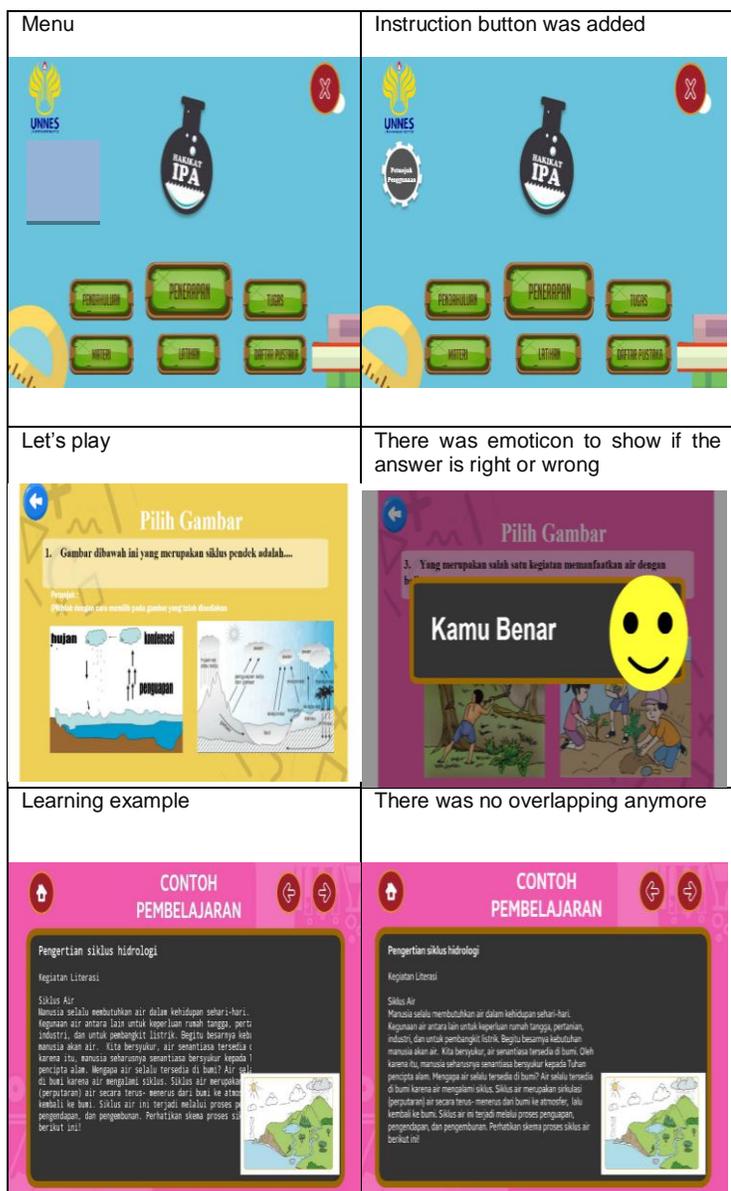
The initial step of Research and Development (R&D) method according to Sugiyono is potential and problem. Research began with a potential or problem. In this step, preliminary research was carried out to obtain information that there was a need for the development of instructional media in the form of interactive learning media in science learning that can foster students' inspiration in science learning. After the potentials and problems can be demonstrated factually and updated, various information can be used as a planning material in the development of interactive learning media in science learning that inspires students in learning science. Data collection were in the form of analysis of interactive media developed, material developed in the media, games in media development that can foster students' inspiration in designing scenarios and worksheets for elementary school science learning in accordance with the Natural Sciences' Components.

The results of data collection were formulated into a design of the product developed. The first stage was making a scheme or rough design of the product. Next was developing a rough design began with the preparation of flowchart, templates, study libraries to enrich the material in the Natural Sciences' Components, the selection of materials in science learning in elementary schools for the students, the choice of science interactive media formats with Anime CC software, making the initial design as draft I. Design validation is an activity to assess whether the product design is effective. The results of the

initial product, namely draft I, were consulted with subject expert of natural science education. From the discussion, several inputs were obtained such as : the exercises form, adjusting the content of the material with the science curriculum in elementary school, material and pictures placing, and the instructions needed on interactive media. In addition to validation with subject expert, the media was also consulted with media expert, the result was that the content was complete and the design was intended for elementary school teacher education students not elementary school students. The results of the subject expert validation obtained an average score of 3.6 and the validation of the media experts obtained a score of 3.5 in the very good category and very feasible to be used with appropriate media input improvements. After the validation of the media by experts, suggestions for improvements to the developed media were subsequently revised to draft II. These improvements included completing the compiler's name on the front cover, changing the icon to Natural Sciences' Components on the homepage, adding instructions for the menu, adding responses in the form of true or false emoticon after selecting answers on let's play, fixing overlapping of writing and images on the application (learning examples).

**Tabel 1.** The Result of Experts' Validation

The lacks found (Draft I)	Revision (Draft II)
<p>Front Cover</p>	<p>Completing the compiler's name</p>
<p>Homepage</p>	<p>The icon was changed</p>



**Tabel 2.** The result of product test

The lacks found (Draft II)	Revision (Draft III)
<p><b>Task</b></p> <p>TUGAS</p> <p>Menerapkan Hakikat IPA dalam pembelajaran</p> <p>Pilih KD 3 dan 4 pada standar isi (kelas 4, 5 dan 6) tentang IPA, tentukan indikator yang disesuaikan dengan KD tersebut. Buat skenario pembelajarannya dan kegiatan siswa dituangkan dalam LK dengan menerapkan hakikat IPA!</p>	<p><b>Task</b></p> <p>TUGAS</p> <p>Menerapkan Hakikat IPA dalam pembelajaran</p> <p>Pilih KD 3 dan 4 pada standar isi (kelas 4, 5 dan 6) tentang IPA, tentukan indikator yang disesuaikan dengan KD tersebut. Buat skenario pembelajarannya dan kegiatan siswa dituangkan dalam LK dengan menerapkan hakikat IPA!</p>

After the media was validated and revised according to suggestions and declared worthy to be trialled, further tests were conducted on a large scale that taken in one class of Science Education courses. The trial was carried out in Class 3 totaling 34 students. The results of the pretest showed an average of 65.5 the highest value of 80 and the lowest value of 40. After the pretest, the lecture continued with preliminary activities, then continued with core activities. In the core activities, students used media to study the Natural Science Component and its application in science learning in elementary schools through interactive learning media using laptops. Furthermore, students worked on the assignments in the media, namely developing learning scenarios along with Student Worksheets for elementary school students according to the Basic Competency (KD) 3 and 4.

The inspirational character developed were the ability to compile learning scenarios and worksheet including the KD conformity with material developed in learning scenarios, Completeness of the True Science aspects (products, processes, attitudes, technology) in learning scenarios, students' creativity developed in learning scenarios, steps in worksheets. The results of the assessment of indicator 3.1 is in good-average category. At the end of the lecture, students were given a post-test using the exercise menu on interactive media. In accordance with the results of Taufik's research (2016), the consequence of the idea that critical thinking skills are essential in science learning and needs for stimulating elements to create an evaluation system that could open the mindset of convention of the facts towards critical thinking. The result obtained an average score of 80, the highest score was 100 and the lowest score was 70. Ttest results: Paired Two Sample for Means obtained T stat (-1,988) smaller than T critical two tile (2,034) H1 received, which means interactive media can improve learning result. The results of the Gain Test also showed the number of 0.427 in the medium category. The usage test (large group trial) shows that the developed interactive media has been used in learning and obtained good results in terms of growing inspirational character and student learning outcomes that are descriptive as seen from the increase in pretest and posttest. This is supported by the results of research conducted by Widiatmoko (2012), Sholikhakh et al. (2012), and Arda et al. (2015) that states that learning science with interactive media is better than using conventional learning strategies, and is able to increase understanding of concepts and make the learning process

The Interactive learning media that has been validated by the experts then tested on eight students, to know the level of media readability. From the results of small group trials, it was found that all the links on the menu can be operated properly, the application that appears can be read well in various types of brands and sizes of laptop inches. The media has a high level of readability, this is obtained from the results of filling out the questionnaire response / opinion and readability of the use of media products with an average score of 26.6 in the good category. The only improvement made was completing punctuation.

more interesting. After the post-test, students were given a response questionnaire. The analysis of the provision of questionnaires about student interest in interactive media, obtained an average score of 3.2 in good criteria. Inspirational character cannot be formed instantly on students, so in this study was still limited to foster inspiration, because that character cannot be formed in a short but gradual manner. This was in accordance with previous research conducted by Wulandari, Desi, et al (2017) the character of students increased from the category began to appear to be starting to develop, not yet to be entrenched. This is because character habituation cannot be done quickly.

#### 4 CONCLUSION

The process of developing interactive media in natural science learning to foster the inspirational character values of elementary school teacher students included 9 stages of development namely potential and problems, data collection, product design, design validation, product revision I, product trial, product revision II, usage trial, the final product, so it was obtained an interactive media of Natural Sciences' Components material that has special characteristics, which was interactive media that can inspire students to make learning scenarios and worksheets in elementary schools and components contained in interactive media including introduction, material, application, assignments, exercises and bibliography.

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#### REFERENCES

- [1] Arda, S. S. & Darsikin. (2015). Pengembangan Media Pembelajaran Interaktif Berbasis Komputer untuk Siswa SMP kelas VIII. *Jurnal Mitra Sains*, 3 (1), 69-77.
- [2] Cain, Sandra E & Jack, M Evans. 1990. *An Improvement Approach to Elementary Science*. Colombus: Merrill Publisher.
- [3] Carin, A. A., & Robert. B. Sund. (1985). *Teaching Modern Science*. Third edition. Columbus: A Bell & Howell Company
- [4] Sholikhakh, R. A., Rismono dan Waluya, S. B. (2012). Pengembangan Perangkat Pembelajaran Beracuan Konstruktivisme dalam Kemasan CD Interaktif Kelas VIII Materi Geometri dan Pengukuran. *Unnes Journal of Research Mathematics Education*, 1 (1): 13-19.
- [5] Sugiyono. 2015. *Metode Penelitian Pendidikan*. Bandung:Alfabeta.
- [6] Taufiq, Amalia, Parmin, Leviana. (2016). Design of Science Mobile Learning of Eclipse Phenomena with Conservation Insight Android-Based App Inventor 2. *Jurnal Pendidikan IPA Indonesia*. 5 (2) 291-298
- [7] Unnes. 2015. Bahan Ajar Mata Kuliah Konservasi
- [8] Widiyatmoko, A. (2012). "Pengembangan Perangkat Pembelajaran IPA Fisika dengan pendekatan *Physics Edutainment* Berbantuan CD Pembelajaran Interaktif ". *Journal of Primary Education*, 1 (1): 38-44.
- [9] Widodo, S.T, Prasetyaningtyas, FD. 2015. Pemanfaatan Aplikasi Mind Map sebagai Media Inovatif Dalam Pembelajaran Mata Kuliah Pengembangan Pendidikan Kewarganegaraan Sekolah Dasar. *Jurnal PKN Progresif* Vol. 11 No 1.
- [10] Wulandari, D, Prasetyaningtyas, FD & Hartati, Sri. 2017. Pengembangan Pembelajaran *ICARE* berkarakter untuk membekali Kemampuan Keterampilan Proses IPA Mahasiswa Calon Guru SD. *Jurnal Elementary School Journal PGSD FIP UNIMED* Vol7, No 3 (2017) hal (337-345)
- [11] (<http://www.suarapendidikankita.com/2015/12/tujuh-karakteristik-guruinspiratif.html>).