The Effectiveness of Using Interactive Multimedia in Improving the Concept of Fashion Design and Its Application in The Making of Digital Fashion Design

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The Effectiveness of Using Interactive Multimedia in Improving the Concept of Fashion Design and Its Application in The Making of Digital Fashion Design

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Abstract. This research is related to the effort to design a more representative learning system to improve the learning result of digital fashion design, through the development of interactive multimedia based on motion graphic. This research is aimed to know the effect of interactive multimedia application based on motion graphic to increase the mastery of the concept and skill of the students to making fashion designing in digital format. The research method used is quasi experiment with research design of Non-equivalent Control Group Design. The lectures are conducted in two different classes, namely class A as the Experimental Class and class B as the Control Class. From the calculation result after interpreted using Normalize Gain, there is an increase of higher learning result in student with interactive learning based on motion graphic, compared with student achievement on conventional learning. In this research, interactive multimedia learning based on motion graphic is effective toward the improvement of student learning in concept mastering indicator and on the aspect of making fashion design in digital format.

1. Introduction
Teachers as one of the agents in the implementing the education system, became a determinant success of education. Teachers as professionals in the transformation system of education, required in the Law of National Education System Number 20-year 2003 CHAPTER XI Article 40 - paragraph (2), to: "a. creating a meaningful, fun, creative, dynamic and dialogical education atmosphere; b. have a professional commitment to improve the quality of education .... ". In relation to the mission that teachers must carry to improve the quality of education, teachers should have competencies that can be transformed to the students so that they have the appropriate competencies required by the employment and ready to enter and compete in the work field. The vital role of teacher as the spearhead in determining the quality of education, implies the ideal expectation of the figure of a teacher with competence that qualified. The professional aspects of teachers related to the competencies he / she must possess as follows [1]: which includes a combination of experiences that empower (1) individual educators, (2) educational teams, and (3) the educational organization to improve (4) curriculum, (5) instruction, and (6) student assessment in order to (7) facilitate student growth and development. However, empirically still encountered teacher weaknesses during the learning process. Exploration of teaching skills is a weakness that is still widely encountered in the learning process. The conventional teaching method by transferring one-way knowledge from teacher to student is still the choice of most
teachers in teaching. Another weakness in fulfilling its competence is that many vocational teachers are not technologically oriented in developing their subject matter, so materials that should be facilitated by technological means such as computer devices and fashion design subjects still run the old system in their learning.

Currently, the development of information and communication media, both hardware and software occur rapidly, so that conditions have resulted in shifting the role of teachers, where currently teachers can no longer serve as the only source of information for learning activities of the students. Relate with it, then the teacher needs a media that can be utilized as an alternative source of information. One of the technology products that can be used as an innovative media in the learning process is the computer. The existence of today's computers has helped teachers in various interests related to their duties in designing, implementing and evaluating learning. Computers have been widely used in the teaching and learning process, with one goal that the quality of education going one step ahead with advances in technology. With computer-based learning, it is expected to help learners who have a slower learning speed (slow learner) in order to learn effectively, because with computer to reload the required information, while for faster learners (fast learner) can stimulate learning activities [2].

Fashion Design like other design field, in its making is oriented by using computer technology (Computer Aided Design / CAD), so as to produce characterize fashion design in digital format and effective to be applied in the process of making of fashion product. In this regard, the rational step needs to be taken in order for the learning process to succeed effectively, is to develop a learning program that optimizes all components of the teaching and learning process. An innovation is needed in the learning process that can motivate students to actively construct a knowledge so that the learning process itself becomes more meaningful. Meaningful learning will make students more master the material or concept given and will last longer in the memory of the brain. Such capability will be helpful in facilitating learning the concepts and skills in a lecture, especially in practical class. One component of education that can be developed in the learning process and assumed to have a pretty good influence in efforts to implement the achievement of teaching objectives on the fashion design in digital format, is to develop effective and efficient learning media, so that the student behavior changes in accordance with the objectives to be achieved.

Now Learning media is more diverse, ranging from conventional media such as books or traditional props to modern media audio visual form in cassettes, videos, and another modern visual device. Learning media used to optimize the teaching and learning process, strived to be able to grow creativity and motivation in learning activities to improve the quality of education. One of the media used in learning and believed to be more exciting students interest in lectures is interactive multimedia learning. Learning media is also one of the alternative means that can optimize learning activities based on computer technology. This interactive multimedia application is conditioned to present learning materials with a more interesting and informative display, so it is expected to facilitate and increase student interest to learn.

Efforts are made to obtain maximum results on the learning of making fashion design in digital format needs to be designed and developed by optimizing the use of innovative learning media and related directly in the mechanism of computer-based learning. Efforts are made is expected to improve the quality of learning and can motivate students to actively constructed knowledge and skills in the making of fashion design in digital format, so that the learning process in students becomes more meaningful. The use of multimedia in addition is assumed to increase the mastery of the concept of the fashion design process, is also expected to develop student’s skills in making fashion design in digital format.

Information technology in education is applied in the form of interactive multimedia in the form of software (software), which provides facilities to students to learn a material. The use of interactive multimedia applications in learning will improve the efficiency, motivation, and facilitate the active learning, experimental, consistent learning, with student-centered learning [3]. The use of interactive multimedia in learning is also very possible to improve the thinking ability that expected. In general, the benefits that can be gained through the use of interactive multimedia is the learning process can run
more interesting, more interactive, the amount of teaching time can be reduced, the quality of student learning can be improved and the learning process can be done anywhere and anytime, and can improve student’s logic ability [4].

The improvement of mastering the concept of students who follow the learning using cooperative learning group with help from interactive multimedia is significantly higher than the students who follow the conventional learning [5]. The improvement of mastery of the concept and critical thinking skills of students who follow the magnetic plate learning using online interactive multimedia is significantly higher than the students who follow the conventional learning [4].

This research is specifically done to develop the improvement of the concept and skill of fashion designing in digital format that is closely related to the ability to optimize the use of computer. This research is considered to have a high urgency, related to the demands of the world of fashion industry that is currently beginning to switch to the parameters of digitization in the process of product development, one of them is in the design area. Digital logic is considered richer because it contains programs with various facilities that can help the designers in generating more accurate and complex design ideas.

1.1. Interactive Multimedia

Etymologically multimedia comes from the Latin, the word "Multi" which means a lot; variety and "medium" which means something used to convey or bring something. Some multimedia definitions according to some experts include: 1) Multimedia is various combinations of text, graphics, sound, animation, and video delivered using computers or other electronic devices [6]. 2) Multimedia refers to the various combinations of two or more integrated media formats into the form of information or instruction programs [7] while 3) Multimedia as the presentation of the material using words and images [8]. The words are where the material is presented in verbal form, such as using text or oral text. By drawing, it is intended that the material is presented in pictorial form, such as using static graphics, animation or video. This definition is broad enough to cover every multimedia scenario, ranging from multimedia encyclopedia entries to textbook lessons. Based on these opinions it can be concluded that multimedia is a combination of various media (file format) in the form of text, graphics, audio, and interaction and used to convey messages/information from the sender to the recipient of the message / information.

Multimedia is divided into two categories a) Linear Multimedia and b) Interactive Multimedia. A linear multimedia is a multimedia that is not equipped with any controller that the user can operate. This multimedia runs sequentially. Examples: TV and movies. Interactive multimedia is a multimedia equipped with user-operated controller tools, so users can choose what they want for the next process. Examples of interactive multimedia are: interactive game and CD applications. The description in advance describes an important concept, that is, if the user gets the flexibility in controlling the multimedia, then the device is categorized as interactive multimedia. The most important characteristic of interactive multimedia is the students not only pay attention to media or object, but also required to interact during learning. Interactive multimedia combines and synergizes all media elements consisting of [9]: a) text; b) graphs; c) audio; and d) interactivity. The developing process in learning multimedia based on computer can see in figure 1.

![Figure 1. The developing process in learning multimedia based on computer](image-url)
There are several advantages and disadvantages of interactive multimedia as a medium of learning, such as [10]: (1) Interactive means that multimedia program is programmed or designed to be used by individual students (independent study), (2) Giving individual affective which mean more affective in a more individual way, never forgetting, never bored, very patient in performing instruction, as desired, (3) Increasing motivation to learn (4) Giving feedback (response), and (5) Because interactive multimedia is programmed for self-learning, its utilization controls are entirely within the user. Meanwhile, b) The lack of interactive multimedia are: (1) Development requires a professional team and (2) Development takes a long time.

Utilization of multimedia technology as an interactive learning method, is one of the learning tools for students, has some basic strengths [11], namely: a) Mixed. Media using multimedia technology, various existing conventional media can be integrated into one type of intermediate media, such as text media (whiteboard), audio, video, which if separated will require more media. b) User control. Interactive multimedia implementation technology (IMMI), allows users to browse the teaching materials, according to the ability and background knowledge he/she had, in addition to making users more comfortable in studying media content, repeatedly. c) Simulation and visualization. Simulation and visualization is a special function possessed by interactive multimedia, so with animation technology, simulation and visualization of computer, users will get more real information from an abstract information. In some curriculum requires a complex, abstract, dynamic and microscopic process, so that by simulating and visualizing the learner will be able to develop the mental model in its cognitive aspect. d) Different learning styles. Interactive multimedia has the potential to accommodate users with different learning styles.

1.2. Fashion design in digital format
Design is a design something that can be realized on a real object or human behavior that can be felt, seen, heard and touched [12]. Application of design will be linked with various objects associated with human needs such as architectural design, product design, interior design, fashion design and so on. Fashion design as a form of design to fulfill human needs for products and clothing, today has been transformed from the conventional parameters of the design basis, in digital format parameter. Aside from the fashion design as one of the manifestations of the creative process, it is empirically demonstrated changes format (visual display) a revolutionary. The manual design parameter in the previous decade still widely explored on the various interests of its design, is starting to shift and change the format to the digital format design (made by the process of computerization). Manufacture of computer-based fashion design, providing a visual and tangible image characteristic, so the details that exist on the clothing can be visualized with more expressive.

2. Methodology
The method developed in this research is Educational Research and Development (R & D), is a development of multimedia interactive learning on learning Fashion Design, to improve the understanding of concept and skill of fashion designing in digital format. R & D in education as “a process used to develop and validate education product”, a process used to create, develop and validate research products [13]. Both further states that:... our use of term product include bot only material objects, such a text book, instructional films and so forth, but it also intended to refer to established procedures and processes, such as methods of teaching or methods organizing instruction.

The design of this study applied two groups of respondents, namely the Experimental Group and the Control Group. Both groups were pre-tested to determine the initial state of the respondents, whether there was a difference between the Experimental Group and the Control Group. The design pattern applied in this research refers to Pretest-posttest control group design concept [14], can be see in table 1:
Table 1. Design of Research Class Design Treatment

<table>
<thead>
<tr>
<th>Class</th>
<th>Design</th>
<th>Treatment</th>
<th>Test</th>
<th>Begin</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>O₁ X₁ O₂</td>
<td>X₁</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>O₃ X₂ O₄</td>
<td>X₂</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

X₁ = Using Interactive Multimedia
X₂ = Using Conventional Learning

The difference test of two averages of two samples was conducted to determine whether between the Experimental Group and the Control Group there was a difference of N-gain (normalized gain) according to Hake [15], were:

\[
(N - gain) = \frac{\% actual\ gain}{\% potential\ gain} = \frac{\% skor\ postes - \% pretes}{skor\ maksimum - \% skor\ pretes}
\]

In this research, N-gain descriptive analysis using N-gain criterion according to Hake [15] is shown in the following table 2:

Table 2. Category level of N-Gain

<table>
<thead>
<tr>
<th>Limitation</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>g &gt; 0.7</td>
<td>Hi</td>
</tr>
<tr>
<td>0.3 ≤ g ≤ 0.7</td>
<td>Medium</td>
</tr>
<tr>
<td>g &lt; 0.3</td>
<td>Low</td>
</tr>
</tbody>
</table>

3. Results and Discussion

3.1. Results

Based on the data processing of research results on the initial conditions of mastering the fashion design students showed: in the experimental group the average initial ability is 23.06 while in the control group 23.38.

In the next process, different treatments were given to the Experimental Group and Control Group. The Control Group was guided by the conventional method in the learning process, while in the Experimental Group applied the learning using interactive multimedia based on motion graphic.

Based on the calculation of the increase of learning result using Normalized Gain obtained the average increase of higher gain value in Experimental Class that is 71.31%, compared to average gain of gain value in Control Class equal to 65.24%, as illustrated can see in figure 2:

![Figure 2. The calculation of the increase of learning result using Normalized Gain](image-url)
3.2. Discussion
In this study, the data collected is adapted to the needs of analysis, namely the analysis of the concepts of making the fashion design in digital format of the students of Fashion Design Study Program in the subject of Fashion Design that is taught using interactive multimedia in the Experimental Class, and the learning without using interactive multimedia in the Control Class.

The material of the Fashion Design concepts discussed in this research consists of three sub-materials it’s Fashion Design Elements, Fashion Design Principles and Fashion Design Format. The average gain of N-gain for the Experimental Class is 71.31% and the Control Class is 65.24%. The average N-gain for the Experimental Class is included in the high category, while in the Control Class included in the moderate category. Based on these data it can be seen that the average N-gain for the Experimental Class is higher than the average N-gain of the Control Class. The comparison result of the average of N-Gain in mastering the concept in the experimental class and control class for each sub material, obtained the largest N-Gain average in Fashion Design Element sub material, while the smallest N-gain of both classes is obtained in Fashion Design Format sub material. This is allegedly due to the characteristics of each sub-material that affects the delivery of the material in the interactive multimedia used. Format Design sub material has a high degree of difficulty in understanding, because the material contained very specific aspects of technical mastery of the fashion design, especially in Design Production Sketching, in the form of an understanding of 1) developing in the format/shape of fashion design, 2) the concept of the forming and accuracy of the parts of fashion products, 3) the material concepts in the manufacturing process of the garment industry, 4) the concept of the standard size of garment products, and 5) the concept of labeling of garment products. Different from the concept mastering of Fashion Design Elements and Principles which tend to be easier to understand because it more relate to daily life in the use of clothing, the concept mastering of fashion design formats need more detailed review and analysis, especially since this material is closely related to the manufacturing process of clothing products in the garment industry. The data acquisition shows that learning using interactive multimedia is able to provide a better learning experience to the learners, especially from the interesting display of material that presented and time to learn that is not limited by the segment of time in the classroom learning.

4. Conclusion
a. Based on the results of processing and data analysis of the results of research that has been done, regarding the use of interactive multimedia based on motion graphic on learning fashion design in digital format, obtained the following conclusion:
   1) Based on the research result, the average of pre-test result showing the students initial ability in the Experimental Class and the Control Class is relatively same. After going through the learning process, it can be seen that there are differences in the average outcomes of students learning using interactive multimedia learning based on motion graphic that is higher than conventional learning
   2) There’s an increase in the average of learning outcomes in students who do interactive multimedia learning based on animation compared with students who use conventional learning on learning making the fashion design in digital format
   3) Judging from the mastery of learning indicators, interactive multimedia learning based on motion graphic role in improving student learning outcomes to a lesson material thoroughly better than conventional learning, so that interactive multimedia learning based on motion graphic can be said to be effective against student learning outcomes with greater effectiveness compared with conventional learning
b. The interactive multimedia learning based on motion graphic can be said give a positive response to the students, where the learning of making the fashion design with digital format using interactive multimedia based on motion graphic make the students feel easier to understand the subject matter and feel more confident and satisfied with the learning that has been they do
5. Closing
Based on the results of research and discussion shows that the use of interactive multimedia based on motion graphics significantly influence the improvement of learning outcomes in making fashion design in digital format, the real implementation of the learning process of fashion design becomes urgent to be done immediately. In addition to the conclusion above, to obtain better results expected time planning in learning is one thing that must be carefully set by the next researcher, because many unexpected things that can arise in the learning activities.

References