e-ISSN 2963-2870
Vol 3 2022

DIGITAL BOOK WITH CONTEXTUAL LEARNING APPROACH ON GRAPHIC DESIGN SUBJECT FOR HEARING-IMPAIRED STUDENT

Mursalat[1], Eveline Siregar[2], Indina Tarjiah[3], Lia Apriliani[4]

[1,2,3]*University Stated of Jakarta (INDONESIA)*
[4]*University Education of Indonesia (INDONESIA)*

Abstract

Students with hearing impairments have difficulty understanding the basic knowledge of graphic design subject material, such as the basic concepts of design and elements and categorising product design are something abstract for them. This research aims to develop and validate a digital book to supplement learning graphic design in the classroom for students with hearing impairments with a contextual approach. The methodology used in this study is the development of the Lee and Owens model. as for the stages in the development of these learning materials, among others: (a) needs analysis; (b) learning design; (c) development and implementation; and (d) evaluation. The results of the evaluation from expert 61%. And student 66% .; with the average acquisition of all aspects are 63%, it can be concluded that Decent; there is no need to revise.

Keywords: Digital Book, Contextual Learning, Lee and Owens, Graphic Design, Deaf

1 INTRODUCTION

Graphic design is a field of art in getting information through the language of visual communication, which involves the aesthetic rules of the Design (Widya & Darmawan, 2016). It is the most in-demand skill for hearing-impaired students compared to other skills such as batik, woodcraft, computer, and leather. Hearing-impaired is someone with barriers due to internal or external factors that have impacted their hearing abilities and have another excess in visual abilities (Nofiaturrahmah, 2018). As a visual and kinesthetic learning style, they prefer to learn graphic design by practising using computer software programs directly. They are skilled in using graphic design software but need to understand basic design knowledge first to make creative design products (Ramadhani et al., 2018). Basic design, known as the eight main principles, needs to be considered: unity, balance, proportion, emphasis, rhythm, simplicity, clarity, and space and elements, as well as basic knowledge of Graphic Design. Basic knowledge is theoretical and abstract things for students with hearing impairments (Nofiaturrahmah, 2018). Basic knowledge is essential to understanding because it is a soft skill in organising, mixing, and matching various elements while still paying attention to the basic principles of design. This is the competency of a designer in making the creative initial design draft. (Mahendra & Pujawan, 2019).

Commonly in special need school, the learning process in the classroom is less conducive. They are taught with various disabilities with special needs barriers in one classroom. Hearing-impaired students have memory limitations due to language barriers in the vocabulary (Alsindi, 2021). The information they receive is easier to understand visually or translate into their sign language first,

then understanding the intent and purpose of the material needs help to assist personalise (Boamah, 2021). Based on the unconducive learning system and the barriers to information, many students do not get attention when they have difficulty understanding the learning, which impacts the acquisition of learning outcomes.

The graphics design subject is integrated into information technology subjects with the exact duration of learning only one hour a week (Kemendikbud, 2014). The approach still relies on meeting with the teacher in class. From the interview, the limited time to study in class and the lack of teaching materials for students to study at home make teachers feel that they have not been maximal in teaching graphic design lessons. Meanwhile, to make teaching materials, the teacher does not have much time. Another learning supplement is needed to facilitate the learning (Anggraeni et al., 2019).

Learning using technology for hearing-impaired students has been established effectively to assist students in improving their understanding of the learning (Knoors & Marschark, 2014). For example, video is one of the supplements to assist hearing-impaired who have limited memory in understanding the meaning of information. Using video in learning makes them easier to repeat, back and forward media videos to clarify (Nofiaturrahmah, 2018). It also found that several learning technologies such as e-learning, artificial Intelligence, Module, multimedia, video, and hypermedia were developed for hearing-impaired students. Most areas focused on language to assist their barriers to reading comprehension (DeWitt et al., 2015). For the problem of improving basic understanding, digital books have been tested for hearing–impaired students. It is found in mathematics subjects with multi representative approach on digital books proven effective for student (Suarsana, 2021). It can be resumed that digital book is one of the learning technologies that can be implemented in this research.

Furthermore, the research found that the learning strategy of Contextual Teaching and learning has proven effective strategy learning in graphic design subjects in the classroom (Ramadhani et al., 2018). This previous research suggests that the following research would develop electronic learning digital media by visualising the example of concept material with concrete matter (Ramadhani et al., 2018). the same as what has been recommended in previous research states that needs to be developed learning material to assist them as a supplement with appropriate technology (Z Ibrahim, 2021). Based on this, the researcher wants to facilitate the researcher to develop a digital book using the right aspect methodology development research with questions consisting of the following:

1. How does demand analysis of digital books for hearing-impaired in graphic design?
2. How do we develop a digital book for hearing-impaired students in graphic design?

2 METHODOLOGY

This research is a type of research and development (research and development) aiming to develop learning materials and test eligibility. The learning materials developed are A digital book operated using the internet and devices. The model development of this research is Lee and Owens model (2004), which is a model developed to develop electronic learning devices. Lee's development stage and Owens consists of five stages, namely: (1) Needs assessment and analysis, (2) design, (3) Development, (4) Implementation and (5) Evaluation.

The subject was hearing-impaired design graphic students in eleven senior stages at the Special School (SLB N 02 Jakarta). As many as eight students, one graphic designer teacher and one technology information teacher collected data for needs analysis by interviewing and observation. At this stage, researchers conducted observations using an instrument with a four-level Likert scale with four options (1) strongly agree, (2) agree, (3) disagree, (4) strongly disagree that converted into a number adopted in previous research (Zainuddin Ibrahim et al., 2016). For evaluation, using an instrument with a four-level Likert scale with four options (1) excellent, (2) Good, (3) enough, (4) not good that converted into a number. The instrument for evaluation has been validated by using evaluation learning media with an internet-based (Siregar & Hadiansyah, 2018). The expert who conducts the assessment is a person with a special need education field with a master's level and not involved in developing teaching materials (Chaeruman, 2019). The analysis technique uses the score formula for each item and the average score (Akbar, 2013), that is :

$p = \frac{x}{xi}$ x 100 %

P = Prosentase

X = amount score in one item

Xi = amount ideal score

The ending result of validation qualification has four stages (Arikunto, 2010).

Table 1: Qualification of validation qualification

Prosentase (%)	Validation Ceriteria
76% - 100%	Very decent, no need to revise
51% -75 %	Decent, no need to revise
36 % - 50%	Decent enough, needs to be revised
≤ 35 %	Not worth it, needs to be revised

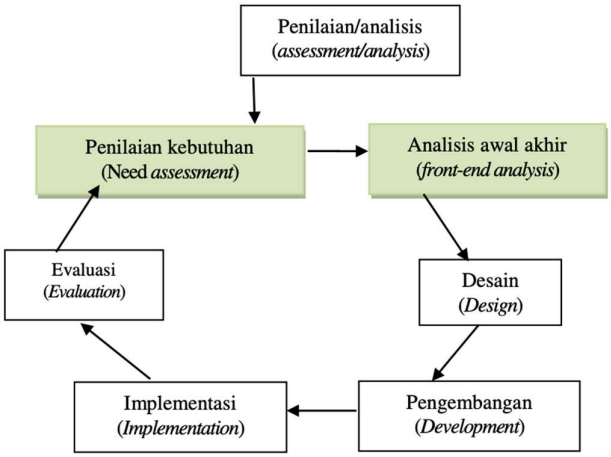

Figure 1: Lee and Owens's model of development (2004)

The first stage needs analysis to find the difficulty of learning to design graphics. Which materials are challenging to understand by giving instruments? What are their expectations for this subject? That information needs to be known to find the gap between the actual condition. The second stage is the design, which includes deciding the learning objectives, listing the media and material, and layout the visualisation of digital books. The third stage is the product development stage, translating product specifications into physical form. This development stage includes making a storyboard, inputting material, and developing interface designs. The product is feasible to implement in the learning process and testing on the internet. The fourth stage is implementation. At this stage, expert reviews evaluate learning media in four aspects: material, learning approach, and media.

Moreover, the expert gives suggestions and improvements. Due to the time limitation, the research was only finished in four stages. The fifth stage is an evaluation, a trial of the student yet to be implemented.

3 FINDINGS AND DISCUSSION

This research's finding explains four stages: need analysis, design, development, and implementation.

3.1 Development result

3.1.1 Need and front-end analysis

Following the average number of data, Hearing-impaired students have difficulty understanding the basic principle of the printed product, the pre-design step, and the basic elements. The learning media that needs is a video with sign language and an electronic book. Based on the data above, learning objectives is setting, can be seen in the data below:

Table 2. Material is considered problematic stated by the student

	average
Understanding of the basic principles of printed products	80%
Pre-design step understanding	78%
Understanding the basic elements	75 %
Categorize design products	75 %

Table 3. Media needs in learning graphic design chosen by the student

	average
Video with sigh language	89%
Media containing of picture, animation, and video	87%
Elektronik book	87 %
Video with subtitle	85 %

In addition to finding out the difficulties of the material faced by students, researchers also observed the readiness of facilities and infrastructure in schools. Researchers found that there were 15 tablets from the procurement of school operational funds that had not been appropriately maximised for learning. This can be used to access digital books for students at school easily.

3.1.2 Design

The results in this design stage are in the table of competencies, table of content, form of Storyboards, Manuscripts, and Flowcharts.

Table 4. Competencies

General	Implement the basic knowledge of graphic design
Indicator	Students able to demonstrate the product design by implementing the principle, and elements.
Specific	Understand basic concepts of graphic design
Indicator	Student able to categorize various kind of graphic design
	Student able to show the differences on nine principles
	Student able in the right element that should be implemented in illustration of design.

3.1.3 Implementation

Researchers at this stage of development make products using several software such as video material using IMovie, Final Cut Pro, Canva Pro, and Filmora. Makin and editing Pictures and graphs using canvas pro and photoshop. Then all the material is combined in one learning material in PowerPoint that converts into HTML format to be easier to operate on the internet as the prototype.

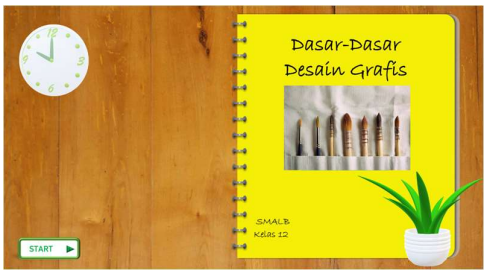

Figure 2: Book Cover

Figure 3 : Visualization by picture

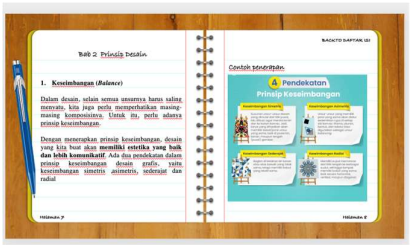

Figure 4: Visualization by illustration

Figure 5: Video show concrete

e-ISSN 2963-2870
Vol 3 2022

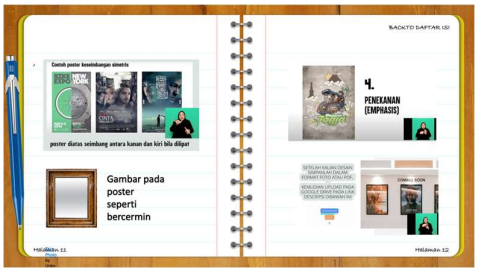

Figure 6 : consists of task

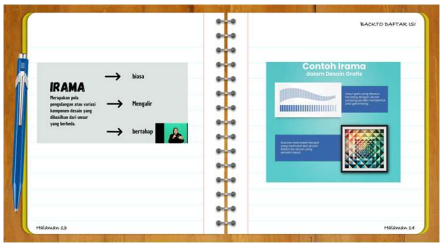

Figure 7: consist of example

3.1.4 Evaluation

After the prototype is completed, it is then submitted to experts from a postgraduate education background in extraordinary education, result:

Table 5: an expert assessment

Technical Quality	17	66%
Usability	4	
Technical visual and audio	10	
Clarity illustration	6	
Learning	16	90%
Content	21	
Congcret example	4	
language suitability	3	86%
Comprehension	3	
Grammar	4	
Spelling accuracy	4	
Naration	4	
term accuracy	3	
accuracy of language structure	3	
Average		61%

The summary of suggestions and improvements from each aspect are :

1. Language Aspect, Overall, it is good, but there is a slight delay in translating from sign language at specific minutes.
2. The material aspect, the pilot part of the implementation of the theory, should be given an eye barrier which is the first learning goal and the first learning goal.

3. Media aspect, For infographics, it is good, but the facilities for sign language corners are given space that does not change because several transitions can break students' focus during learning. After all, the sign language interpreter moves.
4. In the learning aspect. The lessons in the video are pretty good, especially the description of real examples; after accumulated accumulating in all aspects, the learning video product. The average expert test validation results get the following result.
5. The average score shown 66% means that the digital book is Decent; there is no need to revise.

Table 6: by student

Language	4	
materi	3	
media	3	66%
learning	4	
Comprehension	4	
Average		66%

The summary of student evaluation is 66% means Decent; there is no need to revise.

4 CONCLUSION

The average number of gains from experts and students, when put together, is 63% means Decent; there is no need to revise. The most notable from experts are that by visualising the example in a real situation, the student gets the actual examples of concept implementation. The strategy of increasing understanding of the basic concepts of graphic design can be resumed for hearing-impaired students by visualising the concrete material. After their understanding of the concept, the video also gives the task of categorising, summarising, making the poster and presenting in their implementation.

REFERENCES

Akbar, S. (2013). *Instrumen perangkat pembelajaran*. Bandung: PT Remaja Rosdakarya.

Alsindi, D. (2021). Optimizing Online Learning Experiences and Outcomes for Hearing-Impaired Art and Design Students. *International Journal of Learning, Teaching and …*. http://ijlter.org/index.php/ijlter/article/view/3809

Anggraeni, M., Sarinastiti, W., & Wati, S. (2019). Indonesian Sign Language (SIBI) Vocabulary

Learning Media Design Based on Augmented Reality for Hearing-Impaired Children. *Jurnal EECCIS*. https://www.jurnaleeccis.ub.ac.id/index.php/eeccis/article/view/620

Arikunto, S. (2010). Metode peneltian. *Jakarta: Rineka Cipta*.

Boamah, A. (2021). The Deaf and Graphic Design Education: Figuring the Challenges of the Sign Language Interpreter. In *American Journal of Art and Design*. researchgate.net. https://www.researchgate.net/profile/Albert-Boamah/publication/356617567_The_Deaf_and_Graphic_Design_Education_Figuring_the_Challenges_of_the_Sign_Language_Interpreter/links/61a5545471a23a0084c990bd/The-Deaf-and-Graphic-Design-Education-Figuring-the-Chall

Chaeruman, U. A. (2019). Evaluasi Media Pembelajaran. *Dipetik Januari*, 0–15. https://www.researchgate.net/profile/Uwes-Chaeruman/publication/338208296_INSTRUMEN_EVALUASI_MEDIA_PEMBELAJARAN/links/5e06d9404585159aa49f8cd6/INSTRUMEN-EVALUASI-MEDIA-PEMBELAJARAN.pdf

DeWitt, D., Alias, N., Ibrahim, Z., Shing, N. K., & Rashid, S. M. M. (2015). Design of a Learning Module for the Deaf in a Higher Education Institution Using Padlet. *Procedia - Social and Behavioral Sciences*, *176*, 220–226. https://doi.org/10.1016/j.sbspro.2015.01.464

Ibrahim, Z. (2021). Development of a Graphic Design Learning Module for the Deaf and Hard-of-Hearing (DHH) Students Based on Technology and Learning Style in Malaysian TVET …. *Turkish Journal of Computer and Mathematics …*. https://www.turcomat.org/index.php/turkbilmat/article/view/2273

Ibrahim, Zainuddin, Alias, N., & Nordin, A. B. (2016). Needs analysis for graphic design learning module based on technology & learning styles of deaf students. *Cogent Education*, *3*(1). https://doi.org/10.1080/2331186X.2016.1178364

Kemendikbud. (2014). Peraturan Menteri Pendidikan dan kebudayaan Republik Indonesia Nomor 57 Tahun 2014 tentang Kurikulum Sekolah Dasar/Madrasah Ibtidaiyah. *Education*, *53*(9), 1689–1699.

Knoors, H., & Marschark, M. (2014). *Teaching Deaf Learners: Psychological and Developmental Foundations*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199792023.001.0001

Nofiaturrahmah, F. (2018). *PROBLEMATIKA ANAK TUNARUNGU DAN CARA MENGATASINYA* (Vol. 6, Issue 1).

Ramadhani, S., Saide, S., & Indrajit, R. E. (2018). Improving creativity of graphic design for deaf students using contextual teaching learning method (CTL). *ACM International Conference Proceeding Series*, 136–140. https://doi.org/10.1145/3206098.3206128

Siregar, E., & Hadiansyah, T. (2018). *Pedoman Pelaksanaan Evaluasi Media Pembelajaran*. UNJ Press.

Suarsana, I. M. (2021). Developing Interactive Digital Mathematics Book with Multi Representation Approach for Deaf Students. *International Journal of Emerging Technologies in Learning*, *16*(13), 128–141. https://doi.org/10.3991/ijet.v16i13.22459

Widya, L. A. D., & Darmawan, A. J. (2016). Bahan Ajar Kursus Dan Pelatihan Desain Grafis. In *Pengantar Desain Grafis* (Issue 1).

e-ISSN 2963-2870
Vol 3 2022