



# Development of Digital Teaching Materials for Visual Communication Design Competence Test

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**Abstract.** As institution with a license from the National Board for Professional Certification, the Professional Certification Institute (LSP Unesa) has the right to carry out competency tests. In meeting the quality standards of competency certificate holders, training and debriefing will be carried out prior to carrying out the competency test. The training emphasizes the understanding of prospective assessors on the competencies to be tested. It is carried out with a competency scheme that has been selected by prospective assessors. One of the schemes owned by LSP Unesa which does not yet have a teaching material module is the Junior Graphic Designer. This study aims to compile and develop project-based textbooks on the Junior Graphic Designer scheme, to improve the quality and competitiveness of human resources through training and competency tests. 4D which has 4 stages namely; Define, Design, Develop and Dissemination was used in this study. This development research produces a digital module that can be used as a guide in taking the competency test.

**Keywords:** Visual Communication Design, Digital Module, Four D Method.

## 1 Introduction

The global competition for labor is currently growing and competitive. Each workforce is required to have the ability and competence by the expertise they have. Rohmah [1] stated that expertise must also be demonstrated by a competency certificate. With the development of the disruption era 4.0 and the ASEAN Economic Community (AEC), Indonesian workers must be able to face competition from citizens of other countries [1]. In other words, a competency certificate is a tool that can be used to increase the competitiveness of labor flows. This is realized by the managers of the Professional Certification Institute, Universitas Negeri Surabaya (LSP Unesa), who are always committed to providing provisions to every student who will enter the world of work.

LSP Unesa is an implementing agency for work competency certification activities that have received an official license from the National Professional Certification Agency (BNSP). LSP Unesa is a first-party LSP founded by Universitas Negeri Surabaya with the main objective of carrying out work competency certification for competency-based and human resource-based accessions/participants. As a Professional Certification Institution that has obtained a license from BNSP, LSP Unesa has the right to

carry out competency tests regarding the guidelines owned by BNSP, including: 1) BNSP Guidelines 301 concerning the legal basis for Competency Testing, 2) Law Number 20 Year 2003 concerning the National Education System Part Three Article 61 concerning Certification, and 3) Government Regulation No. 52 of 2012: Concerning Competency Certification. Thus, the competency test function in the certification process is very important because it will determine the quality of the competency certificates issued as well as the quality of the workforce and prospective workers holding competency certificates. As stated Rohmah [1] that competency certification has an important role for prospective workers, and educational institutions as creators of strong and competent resources.

LSP Unesa as the organizer of the competency test has the right to develop a set of Competency Test Materials [2]. Furthermore, to meet the quality standards of competency certificate holders, training and debriefing will be carried out before the competency test. This training places more emphasis on students' understanding of the competencies to be tested. This training is carried out by the competency scheme that has been chosen by students. Related to this, LSP Unesa is still in the stage of preparing teaching materials for each scheme which will later be used by resource persons when providing training. One of the schemes owned by LSP Unesa which does not yet have a module is the Young Graphic Designer. This scheme is one of the competencies in the field of expertise in Visual Communication Design. Furthermore, for those who have carried out a competency test and are declared competent, they will be given a competency certificate [3].

Based on the research team's experience, after carrying out several Junior Graphic Designer competency tests on students, several notes need to find solutions so that the competency tests can run well. According to the research team, one of the vital problems is students' ability to follow theoretical material that cannot be maximized because there are no systematic and comprehensive modules. It is stated that the module is one of the media that is considered capable of assisting students in analyzing problems encountered during learning. The module enables students to think creatively and critically, increasing learning motivation [4].

So far, the teaching materials used are still partial, a collection of material taken from several textbooks and videos, so it has not become a complete teaching material. Apart from that, with the wide range of material covered in this competency test, the partial teaching materials make it more difficult for students to study independently because they seem to mind if they have to look for their references to study a topic of discussion. As is well known, an effective and efficient learning process must be properly designed by the teacher [5]. Teachers can prepare material in the module in the form of text and reinforced with infographics. Infographic material is needed to simplify information and make it easier for students to learn [6].

Relevant to the existing problems, the purpose of this study is to compile and develop digital-based teaching materials in the Junior Graphic Designer scheme, to improve the quality and competitiveness of human resources through training and competency tests.

## 2 Methods

This study used research and development methods or the original term named research and development (RnD). The 4D model is a research and development method for learning tools [7], [8]. Research and development is defined as a systematic study of the design, development, and evaluation of learning programs, processes, and products that must meet the criteria of validity, practicality, and effectiveness [9]. More specifically, this study uses a 4D development model, namely Define, Design, Develop, and Disseminate [10].

This research was conducted at Universitas Negeri Surabaya, Faculty of Languages and Arts, especially in the Visual Communication Design study program. This research focused on the Junior Graphic Designer Scheme as the research object, and Visual Communication Design undergraduate students as the research subject.

In order to obtain necessary data in this study. Documentation was carried out in this research to take samples of materials in the Junior Graphic Designer Scheme, and a summary of materials from textbooks used as learning resources which are the primary data of this research.

Secondary data collection techniques were through the study of literature that was conducted by researchers by collecting, reading and observing, studying, and analyzing, and reviewing secondary data and data sources in the form of books, websites, and magazines. This type of data was mainly taken to obtain an overview of the teaching materials to be produced. In addition to library data, data also comes from the field. The field data comes from observations in the classroom when the design product (teaching materials) was tried out.

The analytical procedures were carried out include classifying data according to the design research objectives, analyzing and describing data descriptively, presenting results of the analysis objectively as a basis for designing teaching material products, evaluating the design results by the validator.

## 3 Results and Discussion

There are 5 (five) competencies must be mastered by students to get the title of "competent" as a Junior Graphic Designer. The five competencies are: 1) Applying the Basic Principles of Visual Communication, 2) Applying basic design, 3) Applying design briefs, 4) Operating design software, and 5) Creating design work. These competencies must be carried out by students through competency test questions, both in writing and practicing.

### 3.1 Defining Stage

Define is a stage that defines the conditions needed for learning development. Determining the required conditions is done by adjusting learning needs [11]. There are 5 stages in this defined stage, namely:

**Front-end Analysis.** This analysis focuses on a) the implementation of competency tests that have been carried out in the previous period, b) current phenomena, related to

competency test activities, and c) the potential for creativity and student skills while designing works in competency tests.

Based on the results of observations made by researchers on the Junior Graphic Designer competency test process in the last 2 years, several obstacles were found that had an impact on students' lack of understanding of the material. Some of these factors include; The first is the teaching material factor. The majority of students have difficulty accessing teaching materials because they are not yet in full form but are still partial and scattered in several textbooks, presentation slides, and videos.

Second, there is no comprehensive teaching material, which makes students reluctant to access various existing textbooks, presentation slides, and videos. Yet, by utilizing teaching-designed materials according to learning needs, students are directed to become active learners since they can read or study the material contained in the teaching materials before taking the competency test. Thus, at the time of carrying out the competency test, students are prepared with sufficient information and knowledge, so that the available study time is no longer used by lecturers to explain material at length, but is more used for discussions and discussing material. The factors that have been described in the analysis above are the conclusions that the basic concepts of the Junior Graphic Designer competency test material have not been mastered by students. This is due to the lack of teaching materials provided.

**Students' Analysis.** The students' analysis was limited to students who were the subject of research, namely Visual Communication Design students who were currently taking a competency test. This student analysis was conducted to obtain information about the characteristics of visual communication design students. This analysis focused on two things, namely a) the level of student knowledge, and b) students' psychomotor abilities. Furthermore, the analysis of students can be described as follows.

Next, an analysis of students' psychomotor abilities in taking the competency test. In general, students already have good technical skills. When students were asked to present their design process, only about 15% of students technically still got scores below the average. They tended to be less active in discussion and exploration. Students were afraid to ask questions and express opinions, even though they were always allowed to ask questions about material they don't understand.

From the two analyses described above, it can be concluded that to be able to master the competency test material, students already have sufficient abilities. In addition to cognitive abilities, students also have psychomotor abilities, namely conducting discussions. In terms of creativity, students have been able to grow their ideas and ideas. Meanwhile, the weakness factor was the lack of complete reference material which results in less than optimal student preparation while taking the competency test.

**Concept Analysis.** Material identification was based on indicators and objectives to be achieved in the learning curriculum of the Visual Communication Design study program. This activity was divided into three, namely a) analysis of learning outcomes, b) indicators and learning objectives, and c) analysis of the needs of teaching materials based on predetermined indicators. curriculum of the Indonesian National Qualifications Framework (KKNI) S1 Visual Communication Design Study Program, study program learning outcomes have at least been formulated in 4 (four) descriptive parameters

which include (1) ability in the field of attitude, (2) ability in the field of work, (3) skills in the field of knowledge, and (4) skills in the managerial field.

The formulation of study program learning outcomes in terms of ability in the field of attitude in general has been formulated nationally and for all study programs in one institution (university), the formula was the same. The formulation of study program learning outcomes in the field of work skills was: (1) able to plan the Visual Communication Design and process from the concept also methods to completion stages, (2) able to plan the process of assessing Visual Communication Design works from the concept, method, to completion, (3) able to design with a creativity-oriented approach to function and problem-solving, (4) able to study Visual Communication Design works with theoretical and contextual approaches in the current context, and (5) able to develop Visual Communication Design with a creative-preneurship approach.

The formulation of study program learning outcomes in the field of knowledge was (1) mastery of facts, concepts, principles, laws, theories, and procedures in the core field of Visual Communication Design, (2) mastery of Visual Communication Design design theory with various functional approaches and problem-solving, (3) mastering the design methodology of Visual Communication Design.

The formulation of study program learning outcomes in the managerial field was: (1) able to develop and foster work networks with mentors, colleagues, and colleagues both inside and outside the institution, (2) able to communicate Visual Communication Design work in professional design management work and broad impact on society (3) being able to be accountable for the results of studies, designs, and development of Visual Communication Designs carried out independently or in groups, as well as reporting on the work of design organizations.

In addition to analyze study program learning outcomes, the learning outcomes in the competency test material in the Junior Graphic Designer scheme were understanding and explaining the logo visualization process, along with its application. While the learning outcomes of competency test materials were formulated as follows.

Competencies that are expected after students have taken the competency test on the Junior Graphic Designer scheme in the field of attitude are: students show an appreciative attitude towards the work of others, be ethical and be responsible. The abilities expected after students take this competency test in the field of knowledge are: (1) able to design and explain the characteristics and stages of the design, (2) knowing the methods and flow of the design process.

Additionally, the competencies that were expected after students have taken the competency test on the Junior Graphic Designer scheme in the field of work were: (1) able to prepare material for designing works or designs, (2) able to organize visual elements to design works. While the competencies expected after students take the competency test in the Junior Graphic Designer scheme in the managerial field were (1) able to take responsibility for their work on presentation, both individually and in groups, (2) able to communicate the process of visualizing works based on concepts and ideas, (3) able to cooperate in working on works or designs, (4) able to document their work in the form of a portfolio of works.

**Formulation (Task Analysis).** The tasks developed in the competency test material on the Junior Graphic Designer scheme were based on the expected learning outcomes.

The tasks given aimed to train students' sensitivity in creating and visualizing concepts, mastering techniques for students' ability, practicing perseverance and patience, as well as responsibility and appreciative attitude towards the works they have designed. Furthermore, these tasks were described in the Lesson Plan.

**Learning Objectives Formulation (Specifying Instructional Objectives).** The general learning objective was to achieve the three main parameters in the IQF curriculum which were realized in learning before the competency test, such as attitude skills, knowledge skills, work knowledge, and managerial abilities. Then, these three parameters were embodied in indicators/achievement of competency test implementation. Students were expected to have these three competency parameters in learning in the Junior Graphic Designer scheme.

The specific objectives in this study were described based on predetermined indicators, which were developed from the competencies/learning achievements in the junior graphic designer scheme based on the learning achievements of the study program as follows: a) students can choose design styles according to their needs appropriately; b) students can create design work; c) students can communicate well in conveying their ideas/ideas according to the work produced.

**3.2 Design Stage**

In designing materials, there were two activities carried out, namely: 1) analysis of material needs, and 2) designing learning materials. The material needs analysis based on learning outcomes, indicators, and learning objectives. The material referred to the needs analysis was the material that will be described in teaching materials, namely the Junior Graphic Designer schematic module. Besides, the learning material was designed according to the Semester Learning Implementation Plan. The written material must be based on an analysis of material needs. The full details of this stage can be seen in the following table.

**Table 1.** Summary of the Design Stage.

Activity	Sub-activity	Result achieved
Analysis of material needs	1. Analysis of learning outcomes. 2. Analysis of learning indicator/ objectives.	1. Results of analysis of learning outcomes. 2. Results of analysis of indicators/ learning objectives.
Designing learning materials	Designing the material presented in the module.	The material for each learning activity is presented in the module.

Based on the learning outcomes of the courses described based on learning outcomes, the results of this analysis were based on 4 (four) things related to student abilities, namely: 1) abilities related to attitudes, 2) abilities related to knowledge, 3) abilities related to the field of work, 4) abilities related to managerial aspects.

Learning material will contain of text and be reproduced with pictures or visuals. The application of visual material will be more recognized and remembered [12]. Based on the results of the analysis of the learning materials needs described above, learning

materials were formulated in two learning activities presented in interactive teaching materials for the Junior Graphic Designer scheme. The results of designing learning materials are presented in the following table.

**Table 2.** Results of Designing Learning Materials.

Module	Material Description	Title	Topic
I	The first material: discusses general design insights	Design insights	<ol style="list-style-type: none"> <li>1. History of Design</li> <li>2. Design division</li> <li>3. The role of visual communication design in society</li> </ol>
II	Second material: discussing competency units in the SKKNI reference for the Junior Graphic Designer scheme	Designing logo and application	<ol style="list-style-type: none"> <li>1. Definition of a logo</li> <li>2. Mood boards</li> <li>3. Graphic standard manual</li> <li>4. Application of the logo</li> </ol>

### 3.3 Development Stage

In this stage, instrument validation for module material assessment was carried out by colleagues who understand the contents of the instrument to assess modules, including 1) instrument instructions, 2) instrument content, and 3) language [13]. The results of instrument validation were used to revise the instrument that material experts will use to assess the material presented in the Junior Graphic Designer schematic module.

Instrument validation for graphical assessment/module display aimed to provide an assessment and evaluation of the instrument used to assess the graphics/appearance of the Junior Graphic Designer schematic module by Design Experts. The instrument was validated by colleagues who understood the contents of the instrument to assess the module's graphics, including 1) instrument instructions, 2) instrument content, and 3) language. The results of this instrument validation will be used to revise the instrument used by design experts to assess the graphics/appearance of the Junior Graphic Designer schematic module.

Instrument validation for testing the Junior Graphic Designer schematic module aimed to assess and evaluate the instruments used for a limited trial of the Junior Graphic Designer schematic module for visual communication design study program students. This instrument was validated by colleagues who understand the contents of the instrument for testing the Junior Graphic Designer schematic module, including 1) instrument instructions, 2) instrument content, and 3) language. The results of this instrument validation will be used to revise the instrument used by students of the visual communication design study program after completing the Junior Graphic Designer schematic module trial.

Furthermore, assessment of the competency test module material for the Junior Graphic Designer scheme was carried out after the assessment format has been declared feasible by the validator based on the specified criteria. This assessment aimed to determine the feasibility of the material presented in the module, including 1) suitability for learning, 2) suitability for the curriculum, and 3) use of language. If the material was declared feasible by the validator, the material in this competency test module can be used for trials, otherwise, it must be revised.

Besides, this trial was carried out after the competency test module for the Junior Graphic Designer scheme was declared feasible by the validator for use. This limited trial was conducted on 20 students in the visual communication design study program, class of 2019. This trial aimed to determine the effectiveness of the module developed based on student responses presented in percentage form. The expected data from this trial were the results of student opinions after reading and applying this module during the trial activities. The percentage of student opinion will be an indicator of the feasibility of the textbook being developed. In detail, the activities of the development stage were presented in the following table.

**Table 3.** Summary of the Development Stage of the competency test module on the Junior Graphic Designer scheme.

Activity	Sub-Activity	The Results Achieved
Validation of the competency test module assessment instrument in the Junior Graphic Designer scheme.	Instrument/ questionnaire to be used for the competency test module material assessment in the Junior Graphic Designer scheme by material experts.	Competency test module material assessment instrument on the Junior Graphic Designer scheme.
	Validation of the instrument/questionnaire to be used for graphical assessment/module appearance by design experts.	Graphical assessment instrument/ module display.
Assessment of module material experts (expert appraisal).	Assessment of module material by material experts.	Data and feasibility descriptions of module material.
Module graphic design expert assessment (expert appraisal).	Module graphical assessment by design expert.	Data and description of module graphic feasibility.
Module trials by students (developmental testing).	Module trials.	Data from students on the feasibility of the module being tested.

## 4 Conclusion

The teaching materials developed are formed with good quality if they meet the aspects of (1) (validity), (2) (practicality), and (3) (effectiveness). Based on these criteria, the results of the development stage can be described, namely the research instrument validation stage to determine the validity of the product being developed, the product development evaluation stage by experts to assess the practicality of product development, and learning media trials by students to obtain feedback from students.

The resulting product is teaching material in a digital textbook module consisting of two parts. The total material presented is two (2) subject matter with 5 study materials. The results of the validation of the instrument to assess the feasibility of the competency test module material for the Junior Graphic Designer scheme obtained a score of 3.63



( $3 \leq [RTV]_{TK} \leq 4$ ) in the valid category. Based on these results, the validator recommends that this instrument is feasible to use and that nothing needs to be revised. Assessing the graphic feasibility of the competency test module for the Junior Graphic Designer scheme, a score of 3.65 ( $3 \leq [RTV]_{TK} \leq 4$ ) was evaluated, with a valid category. Based on this assessment, the validator recommends that this instrument is appropriate for use to assess the feasibility of instructional media by media experts. The results of the validator's recommendations are suitable for use with a little revision. The validator notes are revisions of unclear sentences with the same meaning, as well as some writing errors.

In terms of the usefulness of the module, based on the data results, it can be concluded that the teaching materials that were tested from a usability perspective helped students learn the competency test material for the Junior Graphic Designer scheme. The modules developed are easy for students to understand and can be carried out independently outside class hours. Students feel that the modules are practical and easy to learn. For criterion number 4, it appears that 30%, namely as many as 6 students, strongly agree that after using this teaching material, students become more knowledgeable about the theory and characteristics of the material in the competency test. About 60% of 12 students agree that understanding simple communication and perception is beneficial. The remaining 2 people were still undecided, and none of them disagreed.

Criterion number 5 indicates 55% with 11 students strongly agree that using this module makes learning about the material in the competency test easier. Around 40%, there are 8 students agree that module was easier in understanding the competency test material. While 10%, namely as many as 2 students, doubted that with this module it was easier for students to learn about competency test material. From these results, none of the students expressed disagreement.

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