

# Online Learning of Information Technology and Guidance Media Course Based on Learning Styles

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## ABSTRACT

This study aims to develop online learning for information technology courses and media based on student learning styles that meet the acceptability criteria, namely the aspects of usability, accuracy, and feasibility. There are four learning styles that are accommodated, namely: visual, auditory, reading, and kinaesthetic. The development model used is the ADDIE model, including: Analysis, Design, Development, Implementation, and Evaluation. The development stages that have been carried out include analysis, design, development, implementation, and evaluation. The results of the material and media expert test showed that online learning in the course of information technology and guidance media was classified as "very good" criteria and obtained alternative decisions "very feasible". In conclusion, online learning for information technology courses and guidance media meet the acceptability criteria, namely aspects of usability, accuracy, and feasibility.

**Keywords:** *Online learning, Information technology and guidance media, Learning styles*

## 1. INTRODUCTION

Information technology and media guidance is one of the subjects contained in the S-1 Guidance and Counseling study program, Universitas Negeri Surabaya. This course must be taken by guidance and counseling students in the 5th semester with a weight of 3 credits. This course examines the concept of information technology, customization and utilization of Microsoft Word, customization and utilization of Microsoft Excel, customization and utilization of Microsoft PowerPoint, the concept of guidance media, blog development, leaflet development, poster development, guidance board development, animation video development and Google utilization form. The learning of information technology and guidance media subjects has been carried out face-to-face and has not accommodated differences in student learning styles. Learning has not been effective and efficient to achieve learning objectives.

Basically every learner has various kinds of learning styles, but there is one that is dominant, and has a tendency to one particular learning style [1]. In formal learning, in this case in college, teachers should be able to see the dominant learning styles that exist in their students. According to Pritchard learning styles are defined as: the specific ways in which an individual

learns; a learning model - individual choice or best way to think, process information and demonstrate learning; the individual's preferred way of acquiring knowledge and skills; habits, strategies, or regular mental behaviors about learning, particularly intentional learning, that an individual display. Learning styles are the preferred way for individuals to learn. Each individual will adopt the learning approach he is most comfortable with and leave the approach that makes him less comfortable. [2]

According to Fleming there are four learning styles, namely: visual, auditory, reading, and kinaesthetic. Visual learners prefer to learn by sight. They have a good visual memory and prefer information that is presented visually, in the form of diagrams, graphs, maps, posters and displays. They often use hand gestures when describing or remembering events or objects and have a tendency to look up when thinking or remembering information. As for auditory learners prefer to learn by listening. They have a good auditory memory and benefit from discussions, lectures, interviews, listening to stories and audio tapes. They liked sequences, repetitions and summaries, and when recalling memories tilted their heads and used eye level movements. Reading students prefer to process written information and then read it over and over again. Students will easily understand information if they read it over and over again. As for kinesthetic learners prefer

to learn by doing. They are good at remembering events and associating physical feelings or experiences with memories. They enjoy physical activities, field trips, manipulating objects and other hands-on experiences. They often find it difficult to remain still and need regular breaks in class activities. [2] [3]

The measure of learning success is the process of interaction between learners who learns and learners, not in the teacher who conveys information (teaching) [4]. Thus, the main learning engineering is the provision of learning resources. Educators are not the only source of learning, but only one part of the learning resource [5]. All learning resources are designed to encourage learning initiatives and processes to be more effective, efficient and attractive, so that learners remain “at home” to continue learning [6]. Therefore, the function of educators will change towards the teacher as the manager of learning. The function of educators is to design the provision of learning resources to make learning easier, faster, more interesting, and more fun. One of them is by developing learning styles based online learning. [7]

Through implementing online learning, students can study study materials on their own or if needed, students can ask for help in the form of computer-facilitated interactions, such as computer-based learning (CAL) or interactive web pages, learning assisted by teachers or tutors synchronously ( in the same point of time) and asynchronous (in different points of time), or assisted learning other learning resources such as with other students or experts, e-mail, and so on. [8]

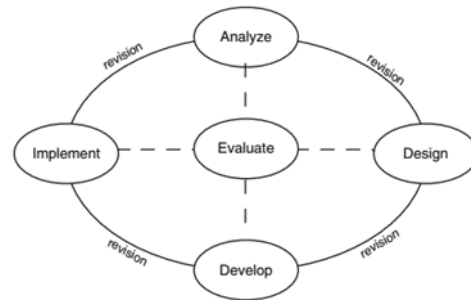
Based on the background description above, the purpose of this study is to develop online learning in information technology courses and guidance media that meet the acceptability criteria, namely aspects of use, accuracy, and feasibility and accommodate differences in student learning styles.

**2. METHOD**

This research is a Research and Development (R&D). Research and Development is a process used to develop accountable educational products. The model chosen is the ADDIE (Analysis – Design – Develop – Implementation - Evaluate) model. ADDIE model is a systematic model used for development models. The application of ADDIE to design instructional systems facilitates the complexity of an intentional learning environment by responding to many situations, interactions in context, and interactions between contexts [9].

According to Branch [9], making products using the ADDIE process remains one of the most effective tools today. Because the ADDIE model is a process that serves as a guiding framework for complex situations, it is appropriate to develop educational products and other

learning resources. The ADDIE model can be described as follows:



**Figure 1** Model ADDIE development

**2.1 Analyze**

At this stage the researcher identifies learning objectives, identifies the characteristics of the material that must be learned and improved for students including skills that need to be developed or strengthened, identifies specific skills that must be achieved by students, topic analysis is carried out to identify and classify learning content. This analysis is carried out to determine the topic of learning. The results of the analysis phase are in the form of a Semester Learning Plan.

**2.2. Design**

The design phase includes the following activities:

- 1) Formulate learning objectives needed to achieve learning outcomes. Learning objectives are statements that describe the abilities or competencies that students will achieve. The goals specified must contain activities.
- 2) Determine the order in which objectives must be achieved (sequencing).
- 3) Choose learning strategies, media, and evaluation.

At the design stage the resulting output is the approved Semester Learning Plan.

**3.3. Development**

At this stage, online learning designs and content are developed. Design and content can vary widely, depending on the resources available. Content / material can be developed based on the purpose and extent of the material that has been previously set. At this stage when the design has been prepared, it is then evaluated by an expert

**3.4. Implementation**

At this stage, online learning is applied to students for three (3) meetings.

### 3.5. Evaluation

At this stage an evaluation includes 4 levels, namely perception, learning, behavior, results. The evaluation of the 4 levels is as follows:

- 1) Student reactions: what they think and feel about online learning.
- 2) Learning: produce increased knowledge or ability.
- 3) Behavior: level of behavior and improvement, ability, implementation / application.
- 4) Results: impact produced after online learning.

## 3. RESULT AND DISCUSSION

### 3.1. Result

The online learning of the Information Technology and Guidance Media course that has been developed is then subject to expert testing. The trials that have been carried out include the material expert test and the media expert test. The material expert test was carried out to obtain assessment data and responses in the form of comments and suggestions on aspects of usefulness, accuracy and feasibility. The material expert involved, namely Dr. Moch. Nursalim, M.Si. and Denok Setiawati, M.Pd., Kons.

**Table 1.** Result of material expert

No	Aspects assessed	Experts	
1.	There is a course identity	4	4
2.	There are learning outcomes in accordance with KKN1	4	4
3.	There is a course description	4	4
4.	Listed all the references used, specifically for online references, a link is provided to make it easier for learners	3	4
5.	There is a competency map	3	4
6.	There are assessment criteria	3	4
7.	RPS is provided which can be downloaded by students	4	4
8.	The content / material presented is in accordance with the course description and outcomes	4	4
9.	The structure of the material is clear, each of which has an introduction, explanation and summary	4	4
10.	The subject and sub-topic are clear	4	4
11.	Content is presented in communicative language, complete, and there are links to sites or documents to enrich the content	4	4
12.	There are links to terms and their meanings, lists of notations, and lists of symbols, especially when they are mentioned frequently in the text	4	3
13.	The content is presented in the form of pictures / charts to facilitate students with a visual learning style	4	4
14.	The content is presented in the form of audio media to facilitate students with an auditory learning style	4	3
15.	The content is presented in the form of narrative text to facilitate students with a read / write learning style	4	4
16.	The content is presented in the form of video tutorials to facilitate students with kinesthetic learning styles	4	4
17.	There are quizzes / practice questions to find out student understanding	3	4
18.	There is a summary at the end of the presentation of the material	4	4
19.	Feedback is to compare the performance of learners with predefined criteria	4	4
Total		72	74
		146	

The material expert's assessment of the instructional learning design on each indicator shows that all indicators obtain an assessment score of 3 and 4 so they are considered accurate and do not need to be revised. However, suggestions and input provided by material experts are: (1) Competency maps should use numbers to show the sequence of activities (2) Online learning is made more interactive.

The material expert's assessment of the overall learning design shows a total score = 146. The total

**Table 2.** Result and media expert

No.	Aspects assessed	Experts	
1.	The clarity of the text on the online learning interface	4	4
2.	Appropriate type of font used	4	4
3.	The font size is suitable for online learning	4	4
4.	Video compatibility with material	4	4
5.	Video quality presented in online learning	4	4
6.	Audio quality in online learning	4	4
7.	Compatibility of audio media with material	4	4
8.	The suitability of the tutorial / simulation presented with the material	4	4
9.	The simulation / tutorial presented supports understanding of the material	4	4
10.	The animation presented is interesting	3	3
11.	Animations that are presented support the material	4	4
12.	The beauty of the colors used in online learning	3	4
13.	There are links / links to display the material	4	4
14.	Navigation buttons available	4	4
15.	Can be accessed using devices with assistive devices or portable and mobile devices	3	3
16.	There are chat / chat room facilities	4	4
Total		61	62
		123	

The media expert's assessment of the instructional learning design on each indicator shows that all indicators receive an accurate assessment and do not need to be revised. The media expert's assessment of the overall learning design shows a total score = 123. The total percentage of the subject (F) = 192.19% and the percentage (P) = 96.05%. Based on the interpretation criteria, P = 96.09% including the criteria "very good" and get an alternative decision "very feasible".

Furthermore, online learning for the Information Technology and Guidance Media course is applied to students majoring in guidance and counseling. The number of 2017A and 2017B class students who took part in online learning in the Information Technology and Media Guidance subject amounted to 72 students.

The evaluation stage is carried out after the lecture is completed. The evaluation instrument was adapted from Branch, a number of 14 statement items and has been

percentage of the subject (F) = 192.11% and the percentage (P) = 96.05%. Based on the interpretation criteria, P = 96.05% including the criteria "very good" and get an alternative decision "very feasible".

The media expert test was carried out to obtain assessment data and responses in the form of comments and suggestions on aspects of usefulness, accuracy and feasibility. The material expert involved, namely Dr. Fajar Arianto, M.Pd. and Utari Dewi, S.Sn., M.Pd.

adapted to language that is easily understood by users (students). [9]

**Table 3.** Online learning evaluation

No	Aspects assessed	Percentage
1.	The learning objectives listed in the RPS were implemented well	47%
2.	Learning materials are relevant to the needs of the counselor profession today	50%
3.	Learning activities increase my knowledge	53%
4.	There is sufficient explanation for the application of the knowledge that I have acquired	59,1%
5.	Learning materials are able to support my learning	51,5%
6.	Audio / visual / video presentations support learning	59,1%
7.	Online learning methods are in accordance with the learning objectives	48,5%
8.	Learning material according to my learning needs	59,1%
9.	Learning materials provided	50,7%
10.	The way of delivering the material	53,7%
11.	Lecturer ability in communication and delivering material	53,7%
12.	Providing feedback (feedback) and direction during the implementation of learning	46,3%
13.	My participation during learning	61,2%
14.	Contribution of online learning to overall learning effectiveness	56,7%

Based on the above recapitulation, it can be concluded that 92.86% of the evaluation instrument items were rated on a scale of 3 with the criteria agree / good. This indicates that students feel the benefits of online learning.

### 3.2. Discussion

Online learning development uses the ADDIE model. The ADDIE model consists of Analysis-Design-

Develop-Implementation-Evaluate. According to Branch, making products using the ADDIE process remains one of the most effective tools today. Furthermore, Branch states that the application of ADDIE to design instructional systems facilitates the complexity of an intentional learning environment by responding to many situations, interactions in context, and interactions between contexts. [9]

Before being implemented, a material and media expert test is first carried out [10] [11]. Material and media expert tests were carried out to obtain assessment data and responses in the form of comments and suggestions on aspects of usefulness, accuracy and appropriateness. The results of the material and media expert test showed that all indicators obtained an assessment score of 3 and 4 so they were considered accurate and did not need to be revised. Based on interpretation criteria, the results of the material expert's test  $P = 96.05\%$  and the results of the media expert's test  $P = 96.09\%$ , including the criteria of "very good" and obtaining an alternative decision "very feasible".

The purpose of this research is to develop online learning for information technology courses and guidance media that meet the acceptability criteria. Acceptability includes aspects of use, accuracy and feasibility. The acceptability criteria are as follows: (a) usability aspect, which refers to how beneficial online learning is developed for students; (b) accuracy aspect, refers to how much online learning can reveal and convey information technically; (c) the feasibility aspect, refers to how much practical online learning. [12] [13]

Online learning information technology courses and guidance media are implemented to students for three (3) meetings. Furthermore, an evaluation is carried out to determine the benefits of online learning for students as users [14]. As according to Branch, the evaluation carried out includes 4 levels, namely: perception, learning, behavior, results. [9]

The results of research and development of online learning in the Information Technology and Guidance Media course support several previous research results. First, the research and development of Wiyono & Susilo which shows that the development of online learning for the guidance and counseling profession meets the acceptability criteria, namely the aspects of usability, accuracy and feasibility [15]. Second, the research and development of Wiyono, Muis, and Khusumadewi shows that the blended learning of the Group Dynamics subject meets the acceptability criteria, namely aspects of usefulness, accuracy, and feasibility [16]. Third, the results of meta-analysis Means, Murphy, & Baki which show that blended learning is better and more effective [17]. Fourth, research Jeffrey, Milne, Suddaby, & Higgins which shows that blended learning can balance

learning that is completely online and fully face-to-face. [18]

#### 4. CONCLUSION

The test results of material experts and media experts, online learning in information technology courses and guidance media meet the acceptability criteria, namely aspects of usability, accuracy, and feasibility. The results of the material and media expert test showed that online learning in the course of information technology and guidance media was classified as "very good" criteria and obtained alternative decisions "very feasible".

#### REFERENCES

- [1] M. J. Z. Abidin, A. A. Rezaee, H. N. Abdullah, and K. K. B. Singh, "Learning styles and overall academic achievement in a specific educational system," *Int. J. Humanit. Soc. Sci.*, vol. 1, no. 10, pp. 143–152, 2011.
- [2] A. Pritchard, *Ways of learning: Learning theories for the classroom*. New York: Routledge, 2017.
- [3] N. D. Fleming, *Teaching and Learning Styles: VARK Strategies*. Honolulu: VARK-Learn, 2001.
- [4] C. Dede, "Comparing frameworks for 21st century skills," *21st century Ski. Rethink. how students Learn*, vol. 20, no. 2010, pp. 51–76, 2010.
- [5] I. S. Horn and J. W. Little, "Attending to problems of practice: Routines and resources for professional learning in teachers' workplace interactions," *Am. Educ. Res. J.*, vol. 47, no. 1, pp. 181–217, 2010.
- [6] F. Rennie and T. Morrison, *E-learning and social networking handbook: Resources for higher education*. Routledge, 2013.
- [7] F. Dağ and A. Geçer, "Relations between online learning and learning styles," *Procedia-Social Behav. Sci.*, vol. 1, no. 1, pp. 862–871, 2009.
- [8] O. O. Jethro, A. M. Grace, and A. K. Thomas, "E-learning and its effects on teaching and learning in a global age," *Int. J. Acad. Res. Bus. Soc. Sci.*, vol. 2, no. 1, p. 203, 2012.
- [9] R. M. Branch, *Instructional design: The ADDIE approach*, vol. 722. Springer Science & Business Media, 2009.
- [10] A. Kristanto, "The Development of Instructional Materials E-Learning Based on Blended Learning," *Int. Educ. Stud.*, vol. 10, no. 7, pp. 10–17, 2017.
- [11] S. Siagian and M. Y. Wau, "Development of interactive multimedia learning in learning instructional design," *Development*, vol. 5, no. 32, 2014.
- [12] M. Bains, P. A. Reynolds, F. McDonald, and M. Sherriff, "Effectiveness and acceptability of face-to-face, blended and e-learning: a randomised trial of orthodontic undergraduates," *Eur. J. Dent. Educ.*, vol. 15, no. 2, pp. 110–117, 2011.
- [13] M. Chemuturi, *Requirements engineering and management for software development projects*. Springer Science & Business Media, 2012.
- [14] N. Cavus, "Selecting a learning management system (LMS) in developing countries: instructors' evaluation," *Interact. Learn. Environ.*, vol. 21, no. 5, pp. 419–437, 2013.
- [15] B. D. W. and H. Susilo, "Development of Online Learning for Undergraduate Guidance and Counseling Students," *Int. J. Innov. Creat. Chang.*, vol. 5, no. 5, pp. 623–634, 2020.
- [16] B. D. Wiyono, T. Muis, and A. Khusumadewi, "Pengembangan Blended Learning Mata Kuliah Dinamika Kelompok untuk Mahasiswa Jurusan Bimbingan Dan Konseling," *J. Bimbing. dan Konseling Terap.*, vol. 2, no. 2, pp. 168–177, 2018.
- [17] B. Means, R. Murphy, and M. Baki, "The Effectiveness of Online and Blended Learning: A Meta-Analysis of the Empirical Literature," *Teach. Coll. Rec.*, vol. 115, no. March 2013, 2013.
- [18] L. M. Jeffrey, J. Milne, G. Suddaby, and A. Higgins, "Blended Learning: How Teachers Balance the Blend of Online and Classroom Components," *J. Inf. Technol. Educ. Res.*, vol. 13, pp. 121–140, 2014.
- [19] A. Pnueli, In transition from global to modular temporal reasoning about programs, in: K.R. Apt (Ed.), *Logics and Models of Concurrent Systems*, Springer, Berlin, Heidelberg, 1984, pp. 123–144. DOI: [https://doi.org/10.1007/978-3-642-82453-1\\_5](https://doi.org/10.1007/978-3-642-82453-1_5)
- [20] B. Meyer, Applying "Design by Contract", *Computer* 25(10) (1992) 40–51. DOI: <https://doi.org/10.1109/2.161279>
- [21] S. Bensalem, M. Bogza, A. Legay, T.H. Nguyen, J. Sifakis, R. Yan, Incremental component-based construction and verification using invariants, in: *Proceedings of the Conference on Formal Methods in Computer Aided Design (FMCAD)*, IEEE Press, Piscataway, NJ, 2010, pp. 257–256.
- [22] H. Barringer, C.S. Pasareanu, D. Giannakopolou,

Proof rules for automated compositional verification through learning, in Proc. of the 2nd International Workshop on Specification and Verification of Component Based Systems, 2003.

- [23] M.G. Bobaru, C.S. Pasareanu, D. Giannakopoulou, Automated assume-guarantee reasoning by abstraction refinement, in: A. Gupta, S. Malik (Eds.), Proceedings of the Computer Aided Verification, Springer, Berlin, Heidelberg, 2008, pp. 135–148. DOI: [https://doi.org/10.1007/978-3-540-70545-1\\_14](https://doi.org/10.1007/978-3-540-70545-1_14)