

Integrating an Instructional Design Model in Video Development for Autism Spectrum Disorder

Che Ku Nuraini Che Ku Mohd, Faaizah Shahbodin, Meylinda Maria, Muliati Sedek, Siti Nurul Mahfuzah Mohamad

Abstract: *The interest in using video among individuals with autism spectrum disorder (ASD) has increased significantly. By using video is able to engage them actively in social activities. Due to that, a deep attention in understanding the potential of video development has been a top priority. Integrating an instructional design video for learning process can help the students to pay more attention and understanding while learning in the classroom. The purpose of the study is to know the details of every part of the learning system process. It is important for features to improve the autism's skill for better understanding while learning process happened. It would be more effective if ADDIE or Dick and Carey's model as the framework develop this instructional design. Based on the results, the respondents are satisfied with the usage of video. The use of ICT needs to be enhanced to students with autism. The usage of the video under teacher super-vision and use of mind challenging videos.*

Keywords - ADDIE; Autism; Instructional Design; Technology; Video.

I. INTRODUCTION

Lately, the demand for instructional design in the learning process is increasing. The researcher stated that instructional design models, is instruction about the nature and scope of instructional designers, that help in the decision process is one of the systematic procedures [9]. Nowadays, new technologies and online services offer the opportunity have significantly entered our lives for sustainable regional development [13]. Everything could not be separated from technology, especially in the industrial sector because technology has been keeping on evolving over time [12]. According to institution needs, it must be used a several of the model systems while developing the instructional design process. The selection and use of instructional design model are changing and is shaped according to the educational needs. Instructional design (ID) or instructional system design (ISD) models have different training environments design, format and visual presentations are prepared to complete the instructional

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design process [11]. Besides that, teaching solution also should be designed according to the instructional design model by using correct ways. Indeed, [10] it has been stated that in 2005, founded that many teachers use educational such as Youtube video as the learning resources and it is become demanding on online media. Currently, the emphasizing on the dimension and definition of the concept in education is vital in supporting students in obtaining the skills to utilize information more than transmission the information from teacher to student [13].

A. Autism Context

Autism is a neurodevelopment disorder. Autism spectrum disorder (ASD) is referred as a complex developmental disability; signs typically appear during early childhood and affect a person's ability to communicate, and interact with others. ASD is defined by a certain set of behaviors or conditions characterized by challenges with social skills, repetitive behaviors, speech, and nonverbal communication, as by unique strengths and differences that affects individuals differently and to varying degrees. The sign of the ASD is determined in early childhood. Thought would be diagnosed with early intervention, individuals with ASD can lead productive, inclusive and fulfilling lives. The diagnosis will be detected in behavioral symptoms or features. The features include the absence of or delay in typical development milestone and the presence of unusual behaviors.

[3] mentioned, excerpted from existing sources, most children with autism have significant learning problems, especially mentally. However, behind them, they have a very high level of intellectual intelligence quotient (IQ). Persons with Asperger's syndrome, which is a condition resembling autism, have average or above average intelligence. Autism behavioral defined-condition based brain dysfunctions that affect the brain's ability to handle information. They have been difficult while processing information such a perceiving, processing and interpreting information and learn new things.

B. Identifying indicators Video-Based Learning

Video-based learning has become a prevalent practice in schools and in many higher education level for teaching and learning process. It will focus on integrating information literacy content in academic disciplines on the development of children's focus on their minds. Furthermore, a little research needed to examine how the specific instructional approaches might be effectively exploiting the potential of video in learning education process.

In education, the video would make it possible to overcome practical real-world constraints and explore the far greater possibilities. Indeed, there are student-centered learning either within the classroom or at home.

Video also can be integrated into online learning system such as LMS, portal, E-class, MOOC etc. Video provides a means of interactive instruction and very flexible. Video has the ability to stop, start and rewind and provide the option to stop each video and challenge students to predict the outcome of a demonstration, and elaborate on. For instance, [8] mention that learners can use it in the parallel video and an online chat room, forum or even video conferencing to communicate with their instructors. It such a great combination of the video with other learning services that have a great potential to provide the students with an integrated online and offline learning process. In facts, it can be a consensus among teacher educators to use video as a powerful tool for education.

C. Video as an Education Tools

Using the video as an education tool, it would be as a feature in the particular user to become huge of preparation while teaching. Indeed, the video would be considered intermediary tools in education process learning between theoretical and practical. [7] stated the video can serve as a particularly useful as intermediary tools between theory and practice. On the other hands, video showing is able to increase the understanding of viewers on related course topics [1], to achieve the goals, a lot of effort is needed while generating an innovative of the idea, advanced in teaching method and facilities and unnecessary infrastructure. In the learning process, many of the instructors or teachers are implementing video lectures, namely as a broadcasting lectures in real time, recording of in-class lectures with a face-to-face meeting and delivering the lectures recordings to the class and finally end up the class with a hands-on activities. On the other hands, for this paper, it considers knowing the ability of teaching are reflected in the classroom and generate it into instructional design action. Deliberately, that ability is considered to be evidence of one's skill in increasing the productive thoughtful about instructions and determine how well is going while teaching the students [2]. Additionally, [4] an ability develops to replicate on teaching and simulate the instructional among teacher in educations. [5], to create an instructional video, need to identify the main of problems and distribution platform very well. It is to know either the platform is suitable to deliver to the participants.

Due to this paper, by integrating the instructional design for the video, there is a need to identify a simple and operative way to integrate the practices into practice. Subsequently, we will review some significant way in the development of video creation. However, all the kinds of the method need to be extended due to the speedy changes in the technology and teaching practice.

II. METHODOLOGY OF INSTRUCTIONAL DESIGN PROCESS

Instructional design (ID) is the practice of systematically designing, developing and delivering instructional products, both digital and physical, in a consistent and reliable fashion towards an efficient, engaging and inspiring acquisition of knowledge. Students also know it as a technology for the development of learning experiences and environment, which

promote the acquisition of specific knowledge and skill. It is a system of procedure to develop education and training programs in an effective, consistent and reliable fashion. Moreover, instructional design theories are to offers explicit guidance on how to help people learn and develop effective learning. Instructional design will make a systematic design procedure be operative, effectual and applicable that less difficult approaches in planning the instruction. The systems approach implies an analysis in understanding how the components interact and require coordination of all activities. A variety of instructional design process model has been described that all the description would include all the elements that are analysis, design, development, implementation, and evaluation (ADDIE) to ensure that can achieve the goals and strategies while conducting the instruction systems. While ADDIE has their conceptual components to describe the ID models and indicates the process of ID, there's also have another method to be used while developing the instructional design which is Dick and Carey's model. It is quietly famous if want to compare between ADDIE and Gagne's model.

A. ADDIE Method

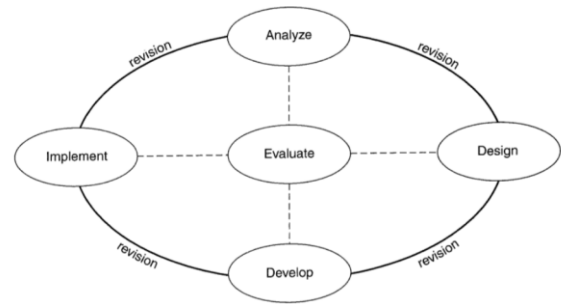


Fig. 1. Elements of the ADDIE Model

Figure 1 represents the relationship among the elements. All the connection relates to each other in the cycleways. In the ADDIE model, five elements namely Analysis, Design, Development, Implementation, and Evaluation. The first element is analysis. Analysis is conducted in order to find students' needs, problems and performances in classroom. Meanwhile, design includes the writing of objectives in measurable terms, classifying learning as to type, specifying learning activities and media. The next element is a development stage. It includes preparing the students and teacher with teaching and learning materials. After the development stage, is the implementation stage. Implementation includes the distributing of instruction and constructing in the set of learning for students. In the meantime, the evaluation includes both formative and summation evaluation as well as revision. Formative is about collecting the data to identify the special needs of the instructions, then, the summation is an evaluation that involves collecting data to access the overall worth of the instruction. Revision is involved in making needed changes based on the formative evaluation data. It is important to state that ADDIE activities are naturally is not completed in a linear, step-by-step but for convenience, they may be presented that way by several of the authors.

For example, during the life of the project, as data are being collected and the development has gained new information's, it is often necessary to move back and forth among the activities of analysis, design and formative evaluation and revision.

B. Dick and Carey’s Model

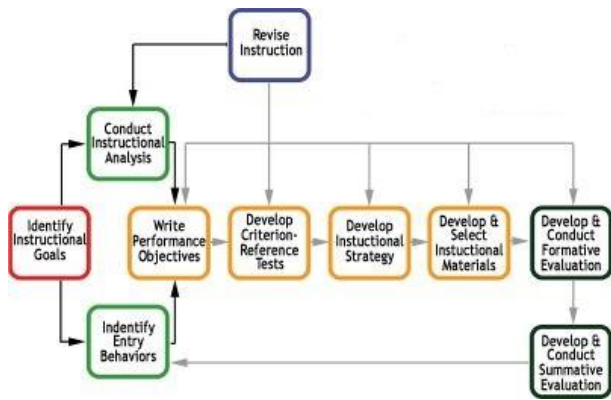


Fig. 2. Model by Dick and Carey

The frequently use and a similar model with ADDIE is the Dick and Carey model. This model assists researcher in finding the best description in conducting the steps for instructional process and summative evaluation [6]. While proposing the instructional model into learning, the model requires to be understood by selecting and determine an appropriate instructional design either suitable or not. To make it achieve an objective, we need some guidelines to allow the learner in determining to what extent the activity has been achieved. Learning for instructional design cannot be separated from the development model of instructional, According to Dick and Carey, designing, producing, evaluating and using a complete learning system, either involves appropriate components and management, are considered as systematic ways learning. There are five important elements in the ID models, yet for this study, researchers have to “slice and dice” the elements and utilize a variety of different terminology. Namely, there are a few models that allow people to imagine the process and create their own management guidelines. Gustafson and Branch suggest the model that has been classified into three categories. Firstly, classroom, which mostly to be delivered by the teacher. Second, products such as computer-based designed that being distributed and finally, a large-scale instructional are a system for entire distance learning to process. This model is directing more on the real-world characteristics where focusing more on learners’ need, assessment, learners’ prior knowledge and context of the instructional design. In entry behaviors and learners’ characteristics phases, assess what skills the students have out to determine the needed for the lesson. For performance objectives, need to figure out the specific goals and objectives for the lesson. In criterion-referenced test item phases, need to create a test that consistent with the performance objectives that reflect what will teach the students. During instructional materials phases, make sure have the needed as a ready for the lesson. In an informative evaluation is about to evaluate how the lesson went and summarize evaluation that is revised all

the above techniques that have been mentioned before for learning systems.

III. RESULTS AND DISCUSSION

Table 1 shows the usability evaluation predicting motivation to learn. The results were evaluated based on the usability evaluation of systems. Usability plays an imperative role in the success of video development. In this study, it has been conducted on 10 respondents between the ages of 20 to 25 years. The respondents are from multimedia backgrounds. In this session, they have been a set of questionnaires about usability issues on the instructional system. The questionnaires distributed were consisting of different segments.

Table - I: Usability Evaluation Predicting Motivation to Learn

Different segments of the questionnaire	1	2	3	4	5
Visibility & Content	-	-	2	3	5
Navigation & Structure	-	1	2	3	4
Consistency & Relevancy	-	-	2	2	6
Error Prevention & Recovery	-	1	4	2	3
Accessibility & Learnability	-	2	1	3	4
Flexibility & Efficiency	-	2	1	4	3
Help & Support	1	3	3	2	1
Effectiveness & Satisfaction	-	-	1	3	6
User's response (%)	1	9	16	29	45

From the table above, it has been found that the respondents agree the evaluation is very usable in predicting motivation to learn Yet, the rest of the respondents are less agreed with all the elements. Therefore; shifting the paradigm toward utilizing the latest technology ICT such as Facebook, YouTube, video, Twitter and others as alternative approaches in learning, is seen as one of the biggest challenges in Malaysian education system. Other Besides that, teachers need to be occupied with latest knowledge and understanding on how to handle and embrace with technology. Moreover, they need to realize that, using technology in gathering new ideas and teaching aids are much attractive and suitable, especially in teaching students with autism [14]. There is a need to raise students’ motivation and interest of students in learning. Thus, teachers are urged to improve or make comments on the improper behavior of the students during the video screening. So, students will not be easily distracted and bored

during teaching and learning process is taking place. In order to motivate students to fully engage in learning, they are given the chance to make biographies and their works will be presented in class [14]. Essentially, learning using video can lessen the mistakes in learning. Therefore, encouraging self-learning among autistic students will assist them to develop new ideas.

IV. CONCLUSIONS

The proposed ADDIE model and the Dick and Carey model can provide online educators or instructors to an effective learning guidance when designing online course materials. There is needed a proper and appropriate implementation of the model that can support online student's engagement, involvement, motivation and focus on learning. Systematic linear instructional design models are the flexible instructional design models preferred by students and educators. Meanwhile, instructional design is important to identify the relationship between the philosophy of the learning and application processes. To make it effective learning for instructional design, research studies about theories, teacher thinking, decision-making, and planning process are needed to be conducted, and it proposed ADDIE and Dick and Carey model that will provide online educators or instructors for effective guidance while designing online materials.

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REFERENCES

1. C, Li, and H, Zhou. Enhancing the Efficiency of Massive Online Learning by Integrating Intelligent Analysis into MOOCs with an Application to Education of Sustainability.2018.
2. Davis, E. A. Characterizing productive reflection among preservice elementary teachers: Seeing what matters. *Teaching and Teacher Education*, 2006. 22, 281–301.2006.
3. Eric, Z. An Introduction to Autism. Original title: Introduction on autism. 2005.
4. Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. Preparing teachers to learn from teaching. *Journal of Teacher Education*, 2007. 58, 47–61.
5. K, Chorianopoulos. A Taxonomy of Video Lecture Styles. 2018.
6. Lyn.T. Educational Theories and Instructional Design Models. Their Place in Simulation. *Nursing Education and Research*, Southern Health 4. 2004.
7. L, M, Gomez, Sherin, M. G., Griesdorn, J., & Finn, L.-E. Creating social relationships: The role of technology in preservice teacher preparation. *Journal of Teacher Education*, 2008. 59, 117–131.
8. M, Giannakos. K, Chorianopoulos, M,Ronchetti., P,Szegedi & S,D,Teasley. Video-Based Learning and Open Online Courses. 2014.
9. Ocak, A.F, Ağca, K.R., Topal, A.D ve Akçayır,. M Instructional design theories, models and applications (Ed: January, A. m.) (2. Print). Ankara: Anı Publishing.2015.
10. Rachmawaty & M, Huzzin. Evaluation of the use of animated narrative video in teaching the narrative text. 2018.
11. Yılmaz, S. Instructional design models: a comparison of Gagne, Briggs&Wagner model of Kemp, Morrison&Ross model and Seels & Glasgow Model at Gazi University Department of computer education, Ankara, Turkey. 2008.
12. Meylinda Maria, Faaizah Shahbodin, Naim Che Pee. Current Trends Overview on Malaysian Higher Education System towards Industry 4.0. *International Journal of Engineering & Technology*, 2018.7 (4.19) 252-255.
13. Che Ku Nuraini Che Ku Mohd & Faaizah Shahbodin. Personalized Learning Environment (PLE) Integration in the 21st Century Classroom. *International Journal of Computer Information Systems*

and Industrial Management Applications. ISSN 2150-7988, 2015, Volume, pp. 014-02.

14. Kathleen Saiman, Sushila Sinnatamby, Laily Mastura Mustafa, Norlidah Alias, Saedah Siraj. Impact of Video on Learning in Students with Autism in Malaysia: Future Prospects. *Procedia - Social and Behavioral Sciences* 103, 2013.pp 459 – 466.

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