Simple Creative Video Explainer for Teacher, Support Education in Industrial 4.0

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Abstract. The study aim to making videos supported by rich literacy is capable of producing creative and meaningful media. Making video explainer media can be done together with students as project assignments, so the meaningfulness of the material becomes deeper, as a form of subject collaboration with IT skills. The Metodology using instructional research and development in the Dick and Carey model. It consists of ten stages, namely: 1) Analysis of learning needs and goals. 2) Analysis of learning. 3) Analysis of learners and context. 4) Formulate performance goals. 5) Developing instruments. 6) Develop learning strategies. 7) Develop and choose learning materials. 8) Designing and conducting formative evaluations. 9) Make revisions. 10) Conduct summative evaluation. The making of this video explainer has been the author of previous research and trials and was declared feasible to be applied to the world of education through the assessment of instructional and IT aspects using a Likert scale 5. Through validation by three media expert lecturers, three material expert lecturers, three supporting teachers with a mean score of 4.05 is included in the excellent category. Furthermore, trials to students in small groups to three students, medium groups to six students and large groups to 26 students with a mean score of 4.24 fall into the excellent category.

Keywords: *Video Explainer, IT-Based Learning Media, Producing Creative, Educational in Industrial 4.0.*

1 Introduction

This phenomenon that occurred in the Industrial Age 4.0 requires dynamic, creative changes and can accommodate the needs that exist in all lines, this includes education. The new age of Industry 4.0 will bring in a considerable change in my digital connect shrinking the distances, removing differences, and conducting real-time transfer knowledge and material transfer globally. Being technologically prepared is the need of the time then to wait for the opportunity to push the educational system to change [1]. The term Industry 4.0 itself originally came from a project initiated by the German government to promote computerization of manufacturing [2]. In the future, there will be a lot of changes in ways of teaching and learning, the roles of lecturers and students. The logic of education should be reversed so that it is the system that conforms to the learner rather than the learner to the system [3]. The main thing from the world of education that is the center of attention is the learning activities. The essence of learning is the delivery of learning messages (content material) from learning resources to students. The process of delivering learning material in the world of education is demanded to be able to accommodate the needs, learning styles, and

dynamics that exist so that the message of learning (the contents of the material) is conveyed properly. Furthermore, the core phenomenon of the industrial era is the presence of information technology that can be a means of accelerating human activity, including the expected line of learning in the 21st century. This is as a consequence of 21st-century learning is that digital technology (IT) will change traditional learning and mobilize skills deemed necessary in digital culture. The author then sees the phenomenon of society as now many teachers are still not utilizing this potential optimally. This is due to various factors whether it is motivation, limited knowledge and information assets, facilities and infrastructure, time allocation (bearing in mind the minimum 24-hour teaching assignment as required by teacher professionalism and other administrative obligations).

The author then highlights urgency the majority of students who enter the Z generation, which when born in conjunction with the birth of information technology tends to consume the IT world well. According to the author's analysis, Positive things are owned by students if they can take advantage of the IT world in education. Some of the factors include, students tend to be in a young productive age, creative spirit, and high curiosity, quickly absorb information (learners). The digital environment provides new opportunities to enable (learners) to create, access, and share multimedia resources and engage in collaborative learning and "distributing" [4]. Many have considered how students can use new media to take greater control of their lives and engage critically with the world around them. Theoretically learning media (IT-based) can facilitate the delivery of information (learning messages). As a cone of Dale's experience that the more concrete material is, the easier it will be to understand. The media of learning that has involvement in many senses (whether audio, video or audio-video) also tend good reception. Empirically the existence of learning media (IT-based) is also widely proven by some researchers who practice it can increase the power of acceptance of learning material. This can be seen in the tendency to increase motivation and interest in learning, the endurance of learning time, rooted information deposition, and student learning outcomes.

Based on the explanation above, the writer give a solution. Tries to collaborate on the part of the teacher and students in utilizing the industrial era 4.0 optimally by collaborating in making learning media as a project task that can become a symbiosis of mutualism between teacher and students. The author tries to present a breakthrough in making IT-based learning media. The chosen media is audiovisual media (this is based on the more five senses involved in learning, the easier the memory) in the form of a video explainer which is then packaged. Making video explainer media can be done together with students as project assignments, so the meaningfulness of the material becomes deeper. The author gives two aspects of study studies, the first is the aspect of teaching (aspects of education) and technical making (aspects of IT). Through a series of systematic processes above, it is expected to be able to make it easier for teachers to apply it in learning together with students. The media created are expected to be able to contribute to the achievement of the understanding of the content of learning material, which in turn multiplayer effects on aspects of student achievement, social life (team), creativity, and other intrinsic aspects. The According to the results of Richard E. Mayer's research [5]. seven the principle in designing multimedia messages is as follows. First, multimedia principles, students can learn better from words and images from words alone. Second, the principle of space closeness, students can learn better when words and related images are interconnected far apart on the page or the screen. Third, the principle of time closeness, students can learn better when words and related images are presented simultaneously (simultaneously) from successive (alternately). Forth, the principle of coherence, students can learn better when words, images pictures, or additional sounds are not

included in the inserted. Five, principles of modality, students can learn more from animation and narration from animation and text on the screen. Sixth, the principle of redundancy, students can learn more from animation, narration, and text on the screen. Seventh, the principle of individual differences.

The Purpose of the study is the effect of design will be stronger for students with low knowledge than those with high knowledge, and students with high spatial abilities from low space. Video explainer can form part of a larger educational video as a motivating, if short, interruption to the presentation mode [6]. Based on the multimedia learning principles above, then Media video explainer combines images and words into one, both in verbal and image form. Through narration by the narrator and back sound supporting music. Using multimedia media in the media is optimal. According to Irwan Saputra"video explainer is a video that takes 1-2 minutes to explain information or knowledge [7]. Therefore, video explainer is used in aspects that require visualization of science. Video explainer is rich in information and straightforward when used in delivering learning material. The development of instructional media using video in this study focused on the explanation of images by the narrator's voice and the emphasis of some text on slides (infographic). Researchers chose the dominant whiteboard video explainer model that is closer to the world of education. However, the combination of several types of video explainer is still done to enrich and strengthen the material. Researchers have conducted studies from several sources related to the use of video explainer in the world of education. The pioneering sites apply video explainer among them Khan Academy and Udemy, and Ruang Guru. According to Andi Prastowo [8], several advantages infographic model video explainer is as follows. First, through video, students get the complete contents and arrangement of the subject matter or exercises. Video can be used as a base interactive with workbooks, evaluation sheets, and user books. Second, through certain effects, videos can strengthen the learning process as well as entertainment from the presentation. Third, through video, information is presented simultaneously on time the same in different classes with unlimited students. Fourth, learning falls into the category of independent learning activities, students learn according to their own pace. Five, able to provide rich and living resources. Sixth, through the video explainer the information conveyed is clear without taking too much time. Seventh, video explorer becomes very meaningful when it comes to information that requires an easy and simple explanation. The presented design principles can be used for all different styles of educational videos, provide a taxonomy of instructional videos with pros and cons to help educators by deciding with type would fit best [9].

2 Method

In this study, researchers used the development procedure according to Walter Dick and Lou Carey. According to Punaji Setyosari [10], the Dick & Carey model goes through several stages as follows. First, the analysis of learning needs and objectives. A needs analysis is carried out to determine the purpose of the program or product being developed. The needs analysis activity is carried out by identifying real conditions in the field, in the classroom, at school or in other settings. Doing a record of all circumstances, for example, materials, materials, and products used do not meet the needs. Through assessing needs, we can know what conditions should exist (what should be) and real conditions in the actual field (what is). Through "seeing" the gaps that occur, then offers an alternative. Second, learning analysis.

Learning analysis includes skills, processes, procedures, and learning tasks to achieve learning objectives. The things that become "felt need" are identified and projected through the product design developed.

Third, student analysis and context. Analysis of learning and context includes the abilities, attitudes, and characteristics of early learners in the learning setting. Includes the characteristics of the learning setting, which is when new knowledge and skills will be used. It can be obtained who the user, class or level, age, and in what situations the product is used. Forth, formulating performance objectives. Formulating performance goals is an activity that translates general objectives into specific goals. Form the formulation of performance goals. The researcher identifies basic competencies and competencies into the formulation of specific objectives that are specific, measurable, observable, and reflect one type of behavior to be measured. The researcher translates the general objectives from competency standards into specific operational objectives through indicators.

Five, developing test instruments or tools. Develop appraisal instruments directly related to specific operational objectives. The instrument can be directly related to the operational objectives to be achieved based on certain indicators. Instruments with a specific purpose in the form of learning outcomes tests. Instruments relating to the product or design developed can be in the form of questionnaires or checklists. Sixth, develop learning strategies. Specifically used to help learners (students) to achieve specific goals. Certain learning strategies that are specifically designed are explicitly stated by researchers (teachers). That is designed is related to the product or design that is developed. Seven, develop and select learning materials. It is a concrete step, It can be printed and manual materials. Product development or design based on certain types and models need to be given supporting arguments.

Eight, designing and conducting formative evaluations. It is an activity to collect information, information, and data carried out by researchers. Evaluations are carried out by researchers as processes, procedures, programs, and products are developed. Formative evaluation can be carried out during the learning process, to increase effectiveness. Nine, revisions, are made to the learning process, procedures, programs, or products by linking to the previous steps. Revisions were made to the first until seven steps. Includes general objectives, learning analysis, initial behavior, performance or performance objectives, test items, learning strategies, and learning materials. Ten, Summative Evaluation. A summative evaluation is done after the development process is complete. According to Atwi Suparman [11]. Summative evaluation is done by looking at the effectiveness of the product based on the comparison of the results of the initial test and the final test on each trial. Next, analyze whether instructional problems that occur have been overcome to the new product. For the video to serve as a productive part of a learning experience, however, the instructor needs to consider cognitive load, non-cognitive elements that impact engagement, and features that promote active learning [12].

3   Result and Discussion

Based on R&D research and a series of limited trials that have been carried out by previous authors in 2017 at MAN 3 Sleman on class X economic subjects specializing in social science material management, through this video explainer learning media it is said that the results are feasible to be applied to the world of education. Similar results have been found

by Vural who used educational videos with embedded questions to teach computer literacy to in-service teachers [13]. Through the ten stages based on the method, this media was created, beginning with a needs analysis preceded by an interview with the needs of the media for teachers and students and the condition of the field survey on the use of media that has been applied, currently the 2013 curriculum has a focal point for students and teachers as facilitators. The author has tried to carry out a series of designs to validation and testing. The test instrument uses a Likert closed scale questionnaire 5 and written suggestions (qualitative). This media has been validated by three material experts, all from UNY lecturers on the learning aspects, material content, and video components with an average value of 3.92 (Good). Afterward the validation test on three media experts, one came from Yogyakarta Amikom University lecturers and two came from UNY lecturers on the aspects of appearance and presentation, sound, and programming, with an average value of 4.13 (Very Good). Furthermore, the validation test for three teaching teachers in MAN 3 Sleman on aspects of material content, learning, appearance and presentation, sound, and programming with an average value of 4.09 (Very Good). After the validation test is said to be feasible, then a revision is made according to the suggestions and input, then a limited and gradual trial is carried out on the students and revised at each stage. Aspects of assessment on the content of the material, learning, appearance and presentation, sound, and programming.

Video as an educational tool is enhanced when instructors consider three elements. First, how to manage the cognitive load of the video. Two, how to maximize student engagement with the video. Three, how to promote active learning from the video [14]. In assessment, before playing a video, the teacher usually delivers some questions to activate students' background knowledge to help them in understanding what information they are going to learn [15]. Assessment results on one-on-one student trials (3 students) received an average of 4.50 (Very Good), a small group trial (six students) received a mean of 4.20 (Very Good), and a large group trial (26 students) got an average of 4.03 (Very Good). Based on the limited research, it is able to provide an illustration for teachers to create video media in collaboration with stakeholders (eg testing of media experts and material experts can work together with lecturers or practitioners (as the implementation of tri dharma for universities to the community, or CSR for practitioners in institution): Through the making of this video explainer, it becomes the teacher's means to increase capacity and creativity as a form of teacher professionalism. In other research demonstrated that the use of videos has a positive effect upon students' perception regarding the enhancement of their learning motivation [16]. In other research, the teacher identified the student views on the effects of video clips used for effectiveness and increased quality in teacher training programs for educational psychology classes, were considered holistically, five general themes were found: "participation during class", "positive attitude", "achievement", "permanency of learning" and "suggestions" [17].

Technically video explainer uses severals software, namely: Adobe Illustrator CS 6, Sparkol Video Scribe, Adobe Premiere Pro, Go Animate, Camtasia, Format Factory, Tanida Quiz Builder, and Lectora Inspire 12, but simply and practically it can be done with only one software, namely Sparkol Video Scribe. This can be done if the teacher wants to directly take pictures that have been made without the need to make, either from the results of the documentation itself or adaptation. Techniques for Making Content Learning Materials: (1) Summarize management materials from relevant sources according to the curriculum for learning materials; (2) Pouring learning material into the storyboard design; (3) Drawing from the storyboard to Adobe Illustrator CS 6; (4) Combine images and text into Sparkol Video Scribe; (5) Arrangement of image sequences and sound recording according to narration into Sparkol Video Scribe; (6) Rendering of recordings to movies in the MOV extension; (7)

Change MOV to AVI extension in Format Factory; (8) Merging of films with AVI extension to be unity of subject matter with Adobe Premiere Pro; (9) Change the AVI extension to FLV with Format Factory. (10) Videos that have the next FLV extension packaged in the Lectora Inspire 12 software. If a video already exists, interactions can be used for a learner-oriented design process too, recommend letting students create interactions for educational videos [18]. The following are the steps taken in the steps taken in making a video explainer from the drawing process to publish. Presented in **Figure.1** to **Figure. 4** below.
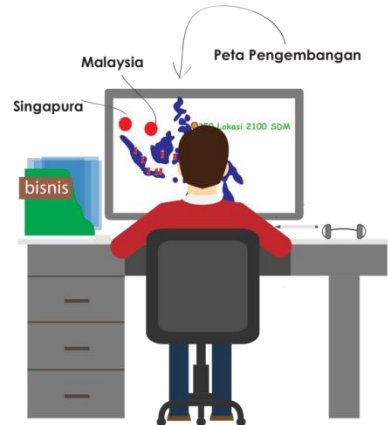
Fig. 1. Examples of contextual graphics animations generated from the storyboard.
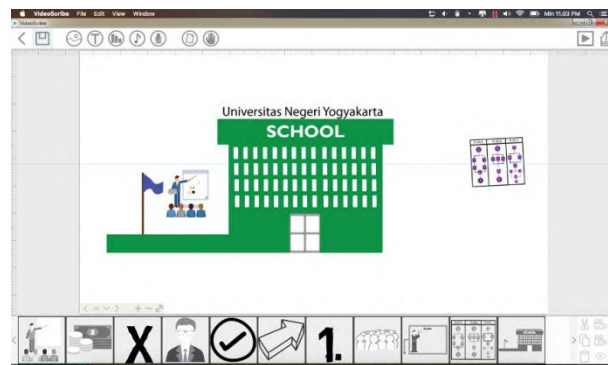
Fig. 2. The process of collaborating on the object you have created in Video Scribe.
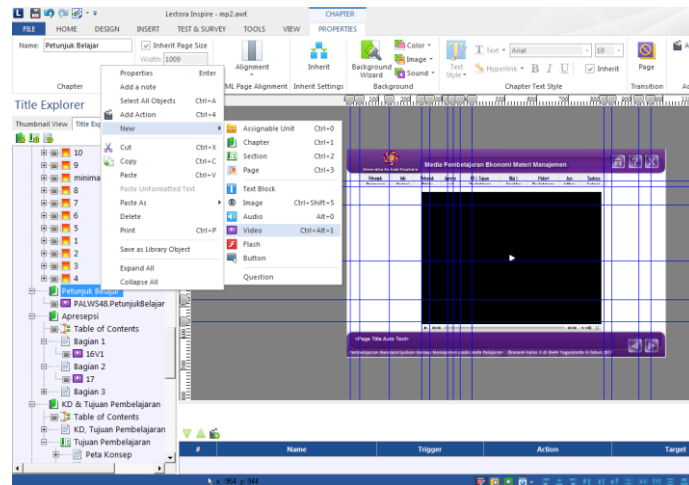
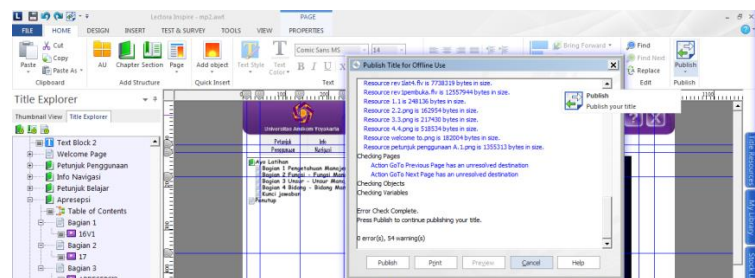**Fig. 3**. Organization of videos in Lectora programs.

Fig. 4. The publishing process.

4   Conclusion

Through making this video explainer able to foster the potential of 21st Century Literacy. Development of technology in education can answer the questions about the impact of technology in reconstruct the education system and the use of technology, in line with learning theory [19]. Based on the results of trials conducted in the development of video explorer learning media above, it has been shown that this video explainer media is feasible and easy to implement in school, interesting, and becomes a meaningful media choice for students. Making this video is a theme that will capture the pedagogical network of production. Which can answer student activities systematically together with the teacher in this multimedia-based learning process. It starts with how students are defined or problematic in literacy projects, how people get access to powerful digital literacy tools for learning, and how traditional school space-time is reconfigured.

Video making, a multimodal expression, and media education of many kinds have a long tradition in human culture and educational contexts. However, the availability of digital technology allows more users to control the "manipulation and editing of images than is available with the old Buckingham technology [20]. Therefore in the current industrial era, 4.0 more and more theorists and digital literacy researchers recommend that educational

institutions need to use digital tools with students to promote print-based and multimodal literacy [21]. This process has shown success in aspects of understanding that make learning more meaningful. Many have observed that literacy practices in the 21st century require educated citizens to be able to consume, produce, and criticize various media [22]. Through utilizing emerging technologies to provide expanded learning opportunities is crucial for the success of future generations, Government of British Columbia [23]. To the use of online communities of practice for sustaining teacher learning, and in particular to the use of video technologies to support teachers learning to notice important aspects of teaching practice [24]. The video explainer can also be distributed via You Tube, because based on UK, according to the survey feedback, more than 85 percent of participants agreed that YouTube can improve their understanding. Besides, they found these kinds of lessons to be helpful and interesting. The learners in this study gained a considerable number of advantages from watching the two lessons on YouTube [25]. Video usage currently dominates internet bandwidth. The High-quality video can be streamed quickly into mobile devices in an educational context. The increasing prevalence of video in daily life is reflected in the educational environment [26].

References

[1] D. K. Umachandran, I. Jurcic, D. Ferdinand-James, M. M. T. Said, and A. A. Rashid, "Gearing Up Education Towards Industry 4.0," *Int. J. Comput. Technol.*, vol. 17, no. 2, pp. 7305–7311, 2018.

[2] Afrianto, "Being a Professional Teacher in the Era of Industrial Revolution 4.0: Opportunities, Challenges and Strategies for Innovative Classroom Practices Afrianto Faculty of Teachers Training and Education (FKIP), Universita," *English Lang. Teach. Res.*, vol. 2, no. 1, pp. 1–13, 2018.

[3] A. A. Shahroom and N. Hussin, "Industrial Revolution 4.0 and Education," *Int. J. Acad. Res. Bus. Soc. Sci.*, vol. 8, no. 9, pp. 314–319, 2018.

[4] C. Lankshear and M. Knobel, "New Literacies: Changing Knowledge and Classroom Learning," no. January, p. 240, 2003.

[5] R. E. Mayer, *Multimedia Learning: Prinsip-Prinsip dan Aplikasi*. Yogyakarta: Pustaka Pelajar, 2009.

[6] W. Laaser and E. A. Toloza, "The changing role of the educational video in higher distance education," *Int. Rev. Res. Open Distance Learn.*, vol. 18, no. 2, pp. 264–276, 2017.

[7] I. Saputra, Implementasi *Animasi 2D dan Video Explainer pada Iklan Televisi Komunitas Sedekah Buku*. STMIK AMIKOM Yogyakarta, 2014.

[8] A. Prastowo, *Panduan Kreatif Membuat Bahan Ajar Inovatif: Menciptakan* MetodePembelajaran *yang Menarik dan Menyenangkan*. Yogyakarta: Diva Press, 2014.

[9] K. Chorianopoulos, "A taxonomy of asynchronous instructional video styles," *Int. Rev. Res. Open Distance Learn.*, vol. 19, no. 1, pp. 294–311, 2018.

[10] P. Setyosari, *Metode Penelitian Pendidikandan Pengembangan*. Jakarta: Prenada Media Group, 2015.

[11] A. Suparman, *Desain Instruksional Modern: Panduan Para Pengajar dan Inovator* Pendidikan. Jakarta: Erlangga, 2014.

[12] C. J. Brame, "Effective Educational Videos," *Vanderbuilt Univ. Cent. Teach.*, pp. 1–8, 2015.

[13] O. F. Vural, "The Impact of a Question-Embedded Video-Based Learning Tool on E-Learning, Educational Sciences: Theory and Practice, 2013," *Educ. Sci. Theory Pract.*,

vol. 13, no. 2, pp. 1315–1323, 2013.

[14] C. J. Brame, "Effective educational videos: Principles and guidelines for maximizing student learning from video content," *CBE Life Sci. Educ.*, vol. 15, no. 4, p. es6.1-es6.6, 2016.

[15] S. Hadijah, "Teaching by using video : Ways to make it more meaningful in EFL classrooms," *Proc. Fourth Int. Semin. English Lang. Teach. ISELT-4*, no. October, pp. 307–315, 2016.

[16] E. Bravo, B. Amante, P. Simo, M. Enache, and V. Fernandez, "Video as a new teaching tool to increase student motivation," *2011 IEEE Glob. Eng. Educ. Conf. EDUCON 2011*, pp. 638–642, 2011.

[17] I. Kosterelioglu, "Student Views on Learning Environments Enriched by Video Clips," *Univers. J. Educ. Res.*, vol. 4, no. 2, pp. 359–369, 2016.

[18] C. Benkada and L. Moccozet, "Enriched interactive videos for teaching and learning," *Proc. - 2017 21st Int. Conf. Inf. Vis. iV 2017*, no. July, pp. 344–349, 2017.

[19] A. A. Sakat, M. Z. M. Zin, R. Muhamad, A. Anzaruddin, N. A. Ahmad, and M. A. Kasmo, "Educational technology media method in teaching and learning progress," *Adv. Nat. Appl. Sci.*, vol. 6, no. 3 SPECL.ISSUE 2, pp. 484–489, 2012.

[20] D. Buckingham, "Media education in the UK: Moving beyond protectionism," *J. Commun.*, 1998.

[21] M. Carrington, V; Robinson, *Digital literacies: Social learning and class- room practices*. London, England: Sage, 2009.

[22] J. Jenson and N. Taylor, "Critical Review and Analysis of the Issue of ' Skills , Technology and Learning ' Final Report," *Crit. Rev.*, pp. 1–39, 2010.

[23] Government of British Columbia, "21st century learning," 2013. [Online]. Available: http://www.bced.gov.bc.ca/dist_learning/21century_learning.html.

[24] V. M. Chieu, P. Herbst, and M. Weiss, *Effect of an animated classroom story embedded in online discussion on helping mathematics teachers learn to notice*, vol. 20, no. 4. 2011.

[25] W. Abdulrahman Almurashi, "the Effective Use of Youtube Videos for Teaching English," *Int. J. English Lang. Linguist. Res.*, vol. 4, no. 3, pp. 32–47, 2016.

[26] Z. Woolfitt, *The Effective Use of Video in Higher Education*. Delft: Inholland University of Applied Sciences, 2015.