Evaluation on Digital Online Videos-Project of Algebra Material

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Abstract
Studying algebra is a challenge for computer science students at the faculty of informatics in Sorong, Papua Barat, Indonesia. This suggested learning materials that were engaging and interactive and focused on practical skills. Algebra courses at times assign online digital video projects as a learning strategy. In this study, the skills of students in video-projects along with additional online, digital assignments pertaining to algebra were observed, examined, and determined. The ICSDR (Identify, Conceptualize/Connect, Storyboard, Develop, Review/Reflect, and Refine) methodology was utilized as the framework for a digital online video production. The ICSDR methodology makes algebraic content interactive for education and helps students in understanding the idea of online digital video projects. This study employed a hybrid approach, including project-based learning , descriptive theoretical-practical evaluation, and subjectively analysis. As a result, students are passionate about using applications for producing movies and working on assignments such as online digital video projects. This increased skills and experience in terms of video processing and video editing. Results from the subjective video evaluation were fairly good in terms of concepts, creativities, theories, and problem solving as practice questions. This way for instructor guidance in the form of video evaluation as a learning task.
Keywords: e-learning, digital video, ICSDR, project-based learning

Introduction

For college students, especially those majoring in informatics, algebra theory became a deviation. Many students consider solving algebra problems on their laptops to be exciting. Problems related to algebraic theory that can be solved manually using calculation, computation, or theorem issues. Previous experience in online lessons with student presentations, which is intended to encourage student involvement, encountered a problem during virtual meetings in Papua, specifically in Sorong. Because of the unstable network, the presentations on e-learning weren't working properly. This case study of project-based learning in an algebra class for informatics majors uses the ICSDR (Identify, Conceptualize/Connect, Storyboard, Develop, Review/Reflect /Revise) methodology. This project combines using a laptop and learning algebra at the same time. The student's task for that project was to produce an online digital video about algebra. The topic covered in that video project includes algebraic theory, material approaches, and problem solution. As a result, students should research and select the topic for the film to be made.

Technology is crucial to remote learning and online lectures (M. S. &Faturrahman Rahmawati, 2018). Because these classes are held at regular times, online learning is defined as the use of virtual tools like Zoom or Google Classroom (Collins & Pascarella, 2003; M. S. Rahmawati & Soekarta, 2021). A digital society is emerging as a result of the rapid growth of technology. A few forms of technology are used in education, like mobile learning. The advantages of mobile learning are its innovations and difficulties. Connectivity, mobility, flexibility, student autonomy, and a new emergence of communication and engagement are some of the benefits (Zaheer et al., 2018). This enables the educational process to keep pace with technology advancements. In order to connect education and learning utilizing technology, a number of studies of learning, teaching, and classroom management systems have been conducted (Burns et al., 2002; Kopeyev et al., 2020). Learning strategies like project-based learning and e-learning have emerged as solutions to the problem of learning with technology. Students responded favorably to the prior study's utilization of online video project assignments via social media. One of the most efficient media types for providing e-learning content is video. Because video is a moving image formed during the recording process, its application in interactive multimedia will offer something fresh (Fleck et al., 2014; Moghavvemi et al., 2018). According to earlier study (Pathak, 2018), it is more effective to take this perspective when learning through videos of presentations because this allows for assessment from both the presenter's and the audience's perspectives. Digital video (Bell & Bull, 2010; Koster, 2018) are sort of video that can be utilized to enhance learning. This videos promises positive effects and good outcomes (Condliffe et al., 2017; Dinmore, 2019). Active learning techniques include project-based learning and creating online digital videos. Students have the chance to express their opinions and ideas through this learning opportunity. Students use their own personal experiences or storylines to create unique videos. For each set of students, they could create a distinct kind of online digital video using any application. However, project-based learning offers guidelines and directions for presenting algebraic theory when creating online digital video. This backs up the active learning concept (Tesfaye & Berhanu, 2015). The focused study is to to develop a comprehensive guide for educators on best practises for accessing video-based tasks and to analyze the impact of video assignment, learning outcomes, and skill development in online courses

Research Method

This study was conducted at Muhammadiyah Sorong University in Indonesia's faculty of informatics engineering. In this study, a blended case study methodology was applied. A project-based learning approach with qualitative descriptive observation is the first step (Gao et al., 2022). Second, a subjective approach is used to evaluate project-based learning through technology for video online (Brame, 2016; Joo et al., 2016; Jung, 2017). The concept of project-based learning used ICSDR.

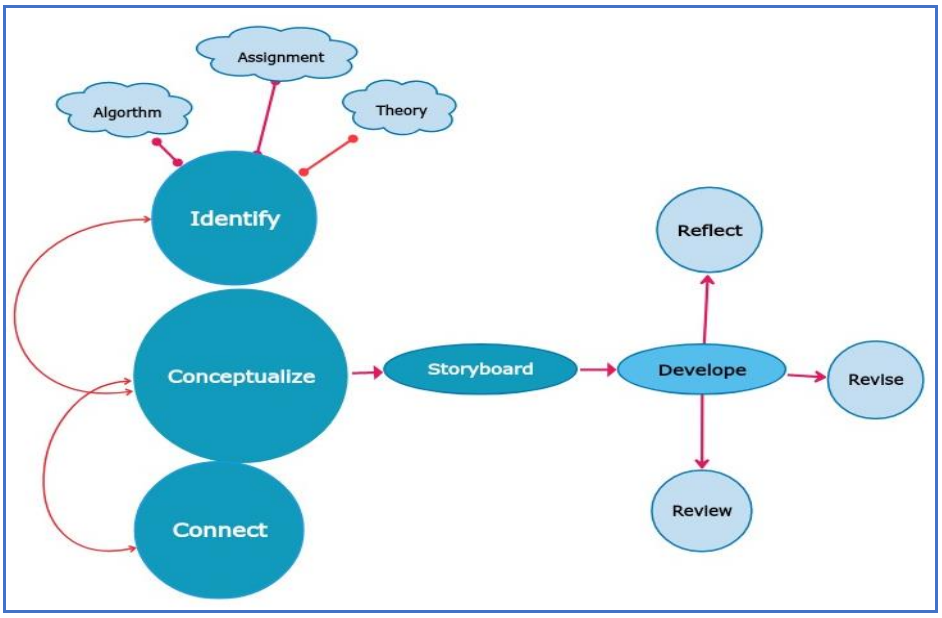


Figure 1. ICSDR Model

According to the processes, a video digital online project is examined. The study instruments include questionnaires, video evaluation forms, digital internet video documents, and interview lists. The objectives of this research were to evaluate the ability of students in online digital video projects involving algebraic material and to offer evaluations of those efforts. 70 students, 50 of them are informatics engineering students at Universitas Muhammadiyah Sorong in West Papua, were utilized as the study's subjects. Twelve different groups made up the algebra lectures they were taking. Each group has three to four pupils. After watching the video, 20 students from various classes submitted an evaluation survey. Three instructors evaluate online digital video in an objective and subjective approach. The evaluation of the materials and concepts is the responsibility of one professor serving as the course supervisor. The evaluation of the online digital videos is the responsibility of two lecturers specializing in informatics

engineering and 20 informatics engineering students who participated in a survey test. In conclusion, this study's data gathering may be classified into three categories:

1. College student's video production that was compiled using YouTube videos.
2. Students' learning concept/score (collected via lecturer with the questionnaires).
3. Students' for the video-appearance (gathered via students with questionnaires and interviewers' results).

By summarizing the data that has been obtained, descriptive qualitative are used to analyze the data. Interpreting data by referring to the context of research and the purpose of study. This involves a deeper understanding of the meaning of observation. The video is evaluated subjectively to determine its perceived value and relevance to the discrete mathematics idea.

Results and Discussion

This research reveals the field results, multiple assumptions as supporters, and some findings as further improvements, as well as findings that may be used and improved, during the examination of the students' interviews and questionnaires (Starman, 2013). This e-learning scenario (Suharyanto & Mailangkay, 2016; Terry Anderson, n.d.) combines online digital video projects and algebraic content as the learning aims. By presenting Algebra information, the assignment was evaluated as (Divayana, 2017) in the form of an online digital a motion picture. The ICSDR model was used as a guide on the assignment to make online digital video.

Recording Media

Recording media facilities are utilized to create online digital video, as shown in Picture 3. According to the survey's results literally almost students use their cellphones to record media, as seen in Picture 1. The Android operating system must be installed on the cell phone. Mobile phone being accessible in e-learning is sufficient to assist the assignment. Several android mobile phone programs, such kinemaster, video editor phone, and inShot, are used for creating or edit online digital videos. Virtual learning is another type of online education.

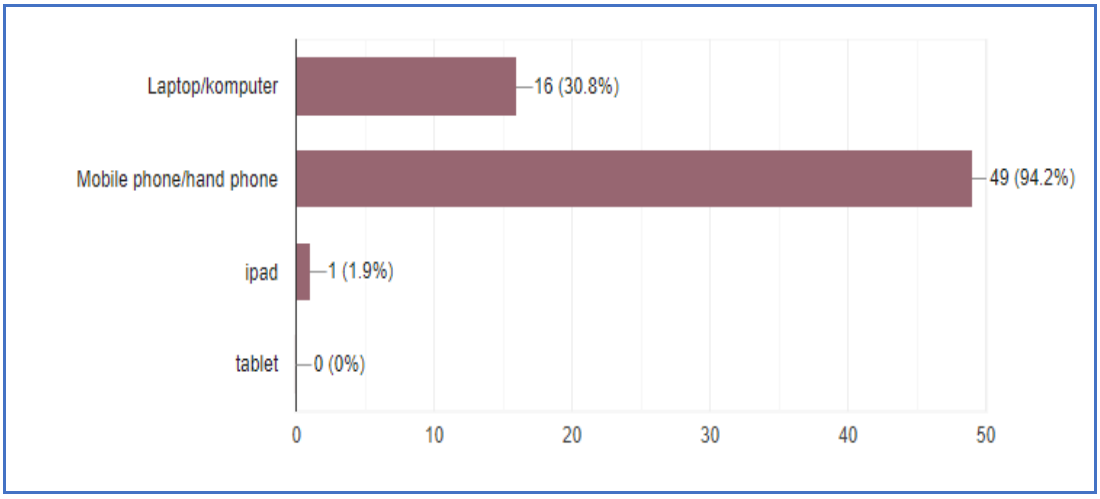


Figure 2. Recording Media

Digital Video

To evaluate students' capacity for transferring algebraic theory, online digital video project assignments are applied. To create conceptual digital videos and possibly comprehended by others, students need to understand the algebraic theory. The algebra theory shown on digital videos has previously been understood by students. This is a substitute for the literature presentation approach used in class, which calls for group participation and discussion in order to enhance sociability skills. This online video was utilized as a precaution against an unstable network. An unreliable network made it difficult for the presentations to operate successfully on the e-learning platform during the virtual meetings in Papua, more specifically in Sorong. Students in this study were proficient in explaining algebraic theory on video. Making an online digital video and uploading it to YouTube is the idea behind an online assignment. Picture 4 demonstrates that the majority of students uploaded their YouTube videos using MPEG.

ICSDR Model

The process of creating videos can be done easily when ideas are turned into well structured screenplays. By instructors and other students, online digital video outcomes are evaluated. By creating ideas for algebraic material and participating on digital video projects, students can learn actively and collaboratively. This helps students learn well.

1. *Identify*

   It might be viewed as a type of planning. Students acquire critical thinking skills and become more involved in their studies. This was visible in the comments on Google Classroom and the dialogues taking place in WhatApp Group during

lectures. The instructor introduces the lesson subject at the outset utilizing online videos that have been uploaded to Google Classroom. Additionally, a contract is profiden in the lecture syllabus before the assignment for the online digital video project is profiden for the lecture's final evaluation. To provide a notion of what an online digital video project assignment looks like, some examples of online digital videos are displayed, including presentations, games, and instructive videos. The schematic identification of the assignments given to student is shown in Picture 3.

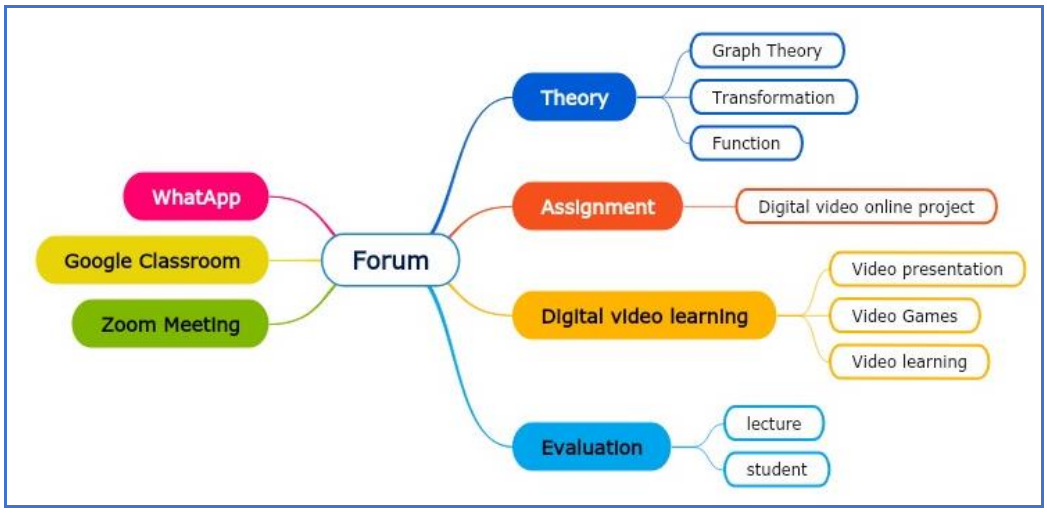


Figure 3. Identify Scheme

2. *Conceptualize*

Making online online videos containing algebraic material (transformations, functions, and graph theory) as part of a project or assignment. Instructions are exactly ought to be on videos. Videos need to provide information including definitions, introductions, applications to daily life, and practice questions. Instructions or methods for online digital video project assignments are offered to students and uploaded to Google Classroom. The YouTube video will contain elements like moving images, quality audio, and clear visuals. Video content discusses discrete mathematics subjects, including graph theory, transformation, logic theory, boolean, etc., with examples and problem-solving. It additionally utilizes use of video techniques, including animation, visual effects, and audio. Several student take part in discussion and responses to inquiries. There should be some explanation and demonstration of a topic in the video, therefore the assignment needed certain guidelines. Using the algebraic material to draw inferences about what was learnt is a crucial component of this video assignment. Instructions for material in accordance with the notion shown in Picture 4 are given below.

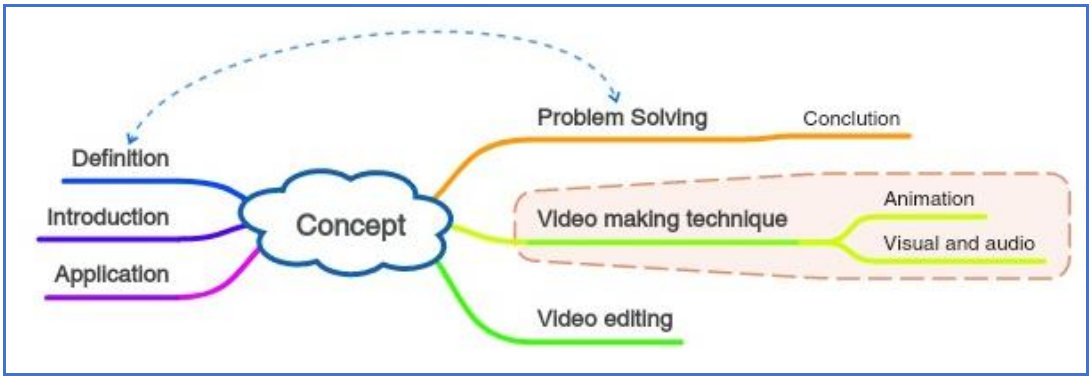


Figure 4. The guidance for concept

3. *Storyboard*

The creation of an online digital video project then begins with creating a scenario. Video formats like educational videos, video games, and video presentations are utilized to create scenarios. The material concept scenarios in the video were created according to the lecturer's direction and guidance. With the development of groups, the students gain collaboration skills. Each group consists of four students. Each team member is responsible for one or more of the following: editors, players, drafters, and cameras. The students could also work on additional tasks, like gathering performers and screenplays. Students must complete the project in accordance with the decision of the group and schedule the video project. Then, the editing process was carried out to polish the output of online digital videos.

4. *Develop*

At this point, discussions between teams of scientific video creators were taking place among the activities. The information discussed is directly applied in the created online digital video, although things relating to this action are not documented. The activities that are done, including watching videos and evaluating what is being discussed, are in line with theory. The students discussed whether the video was informative, simple to comprehend, or consistent with the written material.

5. *Review/reflect/revise*

By watching digital videos that have been created, lecturers and students can review, reflect, and revise in order to get more in-depth knowledge about the online digital videos that have been created. This exercise involves assessing presentations, concepts, and algebraic theories that are created as digital videos that can be viewed online. evaluated in accordance with the guidelines provided by the

lecturer for the assignment. Online digital videos for this exercise have been posted on YouTube so that the lecture and other students can view and evaluate them as well. This makes subjective evaluation simpler. The following are some of the outcomes from the learning process (ICSDR) in the form of assignments using online digital videos:

Table 1. The ICSDR Learning Process

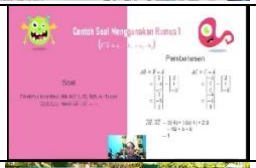
Tittle of Digital Online Video	**Identify**	**Conceptualize**	**Storyboard**	**Develop**	**Review/reflect/ revise**
Graph Theory	*undocument*	50%	45%	*undocument*	40%
Linear Transformation	*undocument*	20%	20%	*undocument*	10%
Relation and Function	*undocument*	30%	35%	*undocument*	50%

Note : *Undocument*, no measurable documentation
Conceptualize, as evident from the discussion of the subject matter in the Google Classroom comments section.
Storyboard, as seen from the student's selected theoretical concepts.
Review/reflect/revise, as seen by the evaluation comments for digital videos posted online.

Evaluation

Evaluation follows next after e-learning has been completed and assignments have been held. This evaluation attempts to measure students' competency in producing videos, their comprehension of the subject matter, and the level of workmanship of their created videos.

Table 2. Evaluation online video types

Online Video	Persentage	Video Types
	12,77%	Animation software, audio explanation
	21,28%	Webcam tool, power point, audio explanation
	10,64%	Broadcast
	8,51%	Animation software, without audio explanation
	2,13%	Tik-Tok video
	17,01%	Powerpoint without animation, audio explanation
	2,13%	Word, screencam, audio explanation
	25,53%	Animation Powerpoint, audio explanation

Created digital videos are uploaded and distributed via links. The video could be seen and evaluated by instructors and other students via a sharing link. It was possible to view and subjectively assess the web video. Writing is about contributions to a video in the form of displaying text or images, and subjective evaluation has aspects that result in

causes for offering replies. The findings of the subjective evaluation are shown in the table below.

Tabel 3. Video's Evaluation subjectively

Indicator	Lecturer (score 6-9)	Precentage	Students (score 6-9)	Precentage
Theori	6	66,67%	8,3	92,22%
Presenter	7,5	83,33%	8,3	92,22%
Problem solving	8,5	**94,44%**	8,6	**95,55%**
Algebra Scenario	8,3	92,22%	8	88,89%
Video appearence	8	88,89%	8,3	92,22%
Duration	7,5	83,33%	7	77,78%

Table 3 result of diagnostic evaluation offered on the video features algebraic material. Video evaluation and assessment is carried out objectively and subjectively. This paper utilized a subjective video evaluation based on instructors' and students' perceptions utilizing the responses to the survey in column 1. However, some student-produced online digital videos fail to include the writing of the utilised literary sources. As a result, the lecturer's evaluation has a low value. The presentation of questions and answers provided in online digital videos, the meanwhile, is of the highest value. All of the created videos contain questions and answers. This shows how students remain to believe that algebra is about solving problems in math. By delivering the material through a power point display, the greatest quality of online digital video assignments is made for the explanation of the topic. With the idea of reading content, such as reading news on television, several groups of students uses the broadcast model. The objective of the ICSDR method's online digital video project assignment is to provide what instructions should be communicated in the video in order to ensure that the plot encounters no obstacles. Likewise to how the appearance and length of the video are modified according to the students level of creativity or editing.

This study could measure or evaluate the project's cooperation factor in addition to the components of online digital video content. Applications for creating and editing videos may be used for educational purposes. In this project, teams or groups of students are needed to work together. Students' participation in online digital recordings will be used as the basis for evaluation. Through sharing, education, and goal alignment, this exercise encourages active learning in students. The outcomes of group collaboration from online digital recordings could be observed, even though they couldn't be measured or evaluated quantitatively. One of the subjective assessments of online digital video assignments is this specific one. Additionally, the subjective assessment has improved

students' application skills while presenting content for online digital video assignments. Table 4 shows certain factors, especially student presentation abilities and application use in online digital video projects:

Tabel 4. The Observed Aspects on Video

Observed aspects	Persentase
Incoporate every student in the presentation of the material	100%
Delivering information in structured and systematic way	95%
Gaining knowledge of a concept of material	86%
Placing focus on significant concept	54%
Providing accurate and appropriate answers for examples	83%

Only 54% of Table 4's data refers to student ability to emphasize concepts. Students gather and study independently because the instructor has never provided the material created by the video. Later so, it was explained by video. This results in key concepts getting less attention. In one case, in an online digital video project featuring Graph Theory content, students fail to explain how Graph Theory began to be and the reason this is important to learn it. Students just drew the graph, indicated the definition, and mentioned the shape. Because the ICSDR approach has been professionally illustrated in an online digital video project, it is simpler for students to deliver information in a systematic and structured approach. The ICSDR method also makes it simpler to oversee how group members are assigned responsibilities so that everyone participates in the presentation. Each participant has a responsibility to fulfill, such as distributing reading material, math problems, or examination questions. As a result, ICSDR is currently placing a high importance on characteristics of delivery and presentation.

Table 5. The observed aspects of video

Observed Aspect	Percentage
Software application (animation)	75%
Video Editing	70%
Diversity of problem solving	94%

Although some still choose for Power Point, students have high aptitudes for choosing applications. However, some students use social media (TikTok) and a variety of video-making apps to create videos. Only a few students apply editing techniques when it comes to video editing, as shown in Table 5. Since most students record their screens, there isn't much editing required. Students continue to believe that Algebra is a subject that can only be taught through practice problems. This is obvious in practically all of online digital videos addressing mathematical topics. Students continue to believe that algebra is just drilled mathematical calculations for answers to questions.

The steps of setting up the idea for conveying algebra theory in the video project are simple. That scripted explanation of the theory. Therefore, online digital video projects increase e-learning's motivation as result as (Faturrahman et al., 2018). Students can learn actively and collaboratively through video projects. Learning of concepts for algebraic content and collaboration on digital video projects should be the students' main priorities. The management of the video project process requires the ICSDR model. The process in which digital video assignments are assigned is an aspect of the ICSDR model that Campbell and Cox (Campbell & Cox, 2018) found to be accurate. There are guidelines and procedures that must be followed in order for the learning process of creating videos to be successful and directed. When instructors and learners involve, learning is thought to proceed more smoothly (Batubara, 2021; Gillett-Swan, 2017). When interacting face-to-face is not possible, providing course material merely in the form of a pdf serves as a social interaction (Stommel et al., 2020). Learning functions nicely since there are online digital video project assignment directions. This might improve the quality of student-produced online digital videos. Students majoring in informatics could benefit from the project to develop a framework for producing online digital videos by gaining experience in the field. The actual outcomes are a greater understanding of independent learning and collaborative learning. Additionally, the videos could be seen as instructor feedback for their students. According to the learning evaluation technique, evaluation is essential for learning. As a result, the evaluation required for video project assignment assessment is based on subjective evaluations. This displays the evaluation's findings, including the scenario that was presented, the video display that was used, the theory that was carried out, and the total duration of the presentation.

Conclusion and Suggestion

The study concludes that digital online video projects can effectively enhance learning outcomes in algebra. The use of the ICSDR model facilitated a structured and comprehensive approach to project-based learning, allowing students to creatively express algebraic concepts while improving their technical skills. The project not only increased student motivation and engagement but also provided a platform for collaborative learning. The findings suggest that similar methodologies could be beneficial in other educational contexts, particularly in areas requiring complex

problem-solving and theoretical understanding. The success of the project underscores the potential of integrating digital tools and interactive media in educational settings to foster a more engaging and effective learning environment. Hopefully, this research will offer suggestions on how to assess projects that take the form of digital online videos. Additionally, it might be claimed that this research shows how algebra assignments, for example, can be evaluated using online videos made by students rather than just problem-solving or questions provided by lecturers. As evidenced by the variety of online digital videos that have been produced, students are passionate about working on projects involving online digital video using a variety of applications. The results of subjective video evaluation for concepts, subjects, and video appearances were quite good.

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