IMPLEMENTATION OF THE VIDEO PROJECT WITH DISTANCE LEARNING ON THE BASIC CHEMISTRY COURSE

Hanifah Setiowati*, Lenni Khotimah Harahap, and Julia Mardhiya

*Departement of Chemistry Education, Faculty of Science and Technology,
Universitas Islam Negeri Walisongo
Jl. Prof. Dr. Hamka, Ngaliyan, Semarang, Central Java, 50185, Indonesia*

* correspondence, email: hanifahsetiowati@walisongo.ac.id

ABSTRACT

Education in the 4.0 era encourages the use of digital technology in a sustainable learning process. This article tries to analyze student responses to implementing a video project in a basic chemistry course. This research is qualitative research with a survey method. The participants were 74 students of the Chemistry Education Study Program and Mathematics Study Program consisting of 8 male students and 66 female students. Data collection techniques using online questionnaires by google form application. The steps in this study are Search for instrument literature to be compiled on the google form, compile a google form student response to the implementation of the video project, distribute the google form questionnaire link to students, and analyze the data obtained. The results showed that students positively responded to the implementation of the video project in terms of autonomy, teamwork, and technology used. The implementation of video projects improves learning skills, collaboration, and digital literacy independently, although students experience problems in video editing because they are not used to using these.

Keywords: BasicChemistry, distance learning, video project

INTRODUCTION

Era 4.0 encourages everything to think progressively, innovatively, and creatively if you don't want to be left behind. This era made many changes in various lines of life. The industrial era 4.0, known as the disruptive innovation phenomenon, emphasises digitalization patterns, artificial intelligence, big data, robotics [1]. Facing these many changes, educational institutions face serious challenges to carry out quality education and produce professional graduates who are reliable and able to compete in the future [2]. Education in the 4.0 era emphasizes the use of digital technology in a sustainable learning process. Therefore, Digital technology has a big impact on educational practice [3].

Education must be able to adapt digital technology; increasingly sophisticated techno-logy can facilitate the learning process. The educational paradigm has changed the conventional model that requires teachers face to face with students to become more flexible learning. One way to take advantage of technological sophistication in the

industrial revolution 4.0 era is to conduct distance learning or what is known as e-learning. Distance learning is expected to increase learning independence. Creating a learning environment is one important aspect of creating a conducive independent learning environment, where the learning environment in the 4.0 education era leads to the development of facilities that give students the freedom to process learning activities by providing flexible support and easy access[4-5].

Information technology and e-learning communication media such as WhatsApp, Google Classroom, YouTube, Zoom, and Google Meet can bring lecturers and students virtually so that the teaching and learning process can be appropriately delivered. However, these media have their respective drawbacks. For example, WhatsApp and Google Classroom have weaknesses in interactions between lecturers and students or other students. In addition, learning materials are challenging to understand because they are not explained directly. YouTube has a weakness in that it cannot interact directly and requires good internet access [6]. Meanwhile, Zoom and Google Meet require a stable, strong internet network and high data access [7].

One of the topics in the Basic Chemistry course is Acids and Bases. Acid-base is one of the concepts classified as difficult to understand [8-9]. This concept is abstract complex [10]. Learning concepts given online are reading and challenging to be fully understood by students due to limited interaction. One of the learning methods to understand the concept of Acid-Base is to use project-based learning. Project-based learning methods are considered useful for students' active learning because they are encouraged to learn more independently and not wholly depend on the teacher [11-12]. Project-based learning is designed for complex problems and requires students to create, solve problems, make decisions, carry out investigative activities, and provide opportunities for students to work independently. The pandemic era that requires students to study independently at home is appropriate if project-based learning is applied to make the material easier to understand.

Integrated technology-based project learning that can be used for self-study at home and increase motivation is implementing video projects. Through video projects, students are trained to be active, creative, and directly involved to develop into students who can learn independently. Implementation of video projects is preferred because it is easily accessible, inexpensive, and easy to use [13]. Other advantages provide motivation and challenge to students [14], increase student activity, self-confidence, independence, and communication skills [15].

Previous research has implemented a language learning video project for science students and can motivate students [14]. Making videos for analytical chemistry and basic chemistry courses can make work more meaningful. Students are more interested in developing factual projects, have mainstream technical skills, and are creative. However, it was not intended to assess students' responses to implementing a video project for

teaching chemistry, especially the concept of Acid-Base. Educators' student responses are important notes to find out deficiencies during the learning process to serve as the basis for further learning improvements.

METHODS

This research is qualitative research with a survey method. The survey method was used to overview the implementation of video projects in Basic Chemistry courses, especially the Acid-Base concept. The study participants were all students of the Faculty of Science and Technology of the Walisongo State Islamic University (UIN) who took Basic Chemistry courses. Thus, participants in this study were 74 students of the Chemistry Education Department and Mathematics Department, consisting of 8 male students and 66 female students. The data collection technique used an online questionnaire with the data collection instrument in a questionnaire using the google form. This form is simplified and shortens the time of data collection, and is suitable if applied to the current pandemic conditions where respondents cannot gather in the same place [16-17].

The steps in this study: Search for instrument literature to be compiled on the google form application, compile a google form student response to the implementation of the *video project*, distribute the google form questionnaire link to students, analyze the data obtained. The instruments used include student responses to independence, collaboration, and technology use [18]. Students are asked to assess the level of suitability of each item. The ranking criteria uses a Likert scale consisting of 5 scales, namely: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree. The indicators used to determine student responses to video projects are shown in Table 1 [18].

Table 1. Student responses to video projects

Aspect	Indicators	Statement
Independence	Independent learning outside the classroom	Video projects made me seek more knowledge outside of the classroom
		Video projects help n class
		Video projects help develop learning independence
		The video project make more responsible for studying
		Trying to figure out what I want to know myself while working on a video project
	Application of knowledge from the class	Apply knowledge from the classroom when work on video projects
	Increased student motivation	After completing the video project, can study efficiently outside the classroom alone
	Student dependence on teachers	Need the instructor's help with a few things when working on a video project
		Considered the instructor's suggestions about the video project
		When there is a problem working on a video project, consult my instructor to complete the video project
Cooperation	Cooperation in groups	Video projects allow me to work with other people as a team
		Video projects enhance collaboration skills with others
	Developing self-confidence	A stimulating video project to dare to say what's on mind

		Video projects allow interacting more with my friends outside of the classroom
	Sharing knowledge	The video project encourages me to exchange knowledge with my friends
	Making decision	Can make decisions about how to do video projects
	Solving problems	When there is a problem doing a video project, my friends and I can solve it together
	Self-evaluate after receiving feedback from others	Learn explaining skills from a friend's suggestion while doing a video project
The use of technology		Video projects made to improve skills using the application
		Working with technology sometimes makes me nervous
		Support the use of technology such as video projects for educational purposes
		More projects with the technology used should be assigned to students to improve digital literacy
		Continue to undertake similar projects involving the technology in the future.

RESULTS AND DISCUSSION

They are learning the concept of Acid-Base by implementing a video project. Analysis of student responses was carried out after the course; the analysis was carried out on the implementation of video projects, especially on the concept of Acid-Base. The data is obtained from the results of the questionnaire that the respondent has filled out. Analysis of student responses using a quantitative approach based on the results of the average calculation, which is then classified. The responses of students who choose the option strongly agree and agree are classified as positive responses, while those who disagree and disagree are classified as negative. Student responses to be studied are divided into three categories: responses to independence, cooperation, and the use of technology.

1. Student Responses to Independence

Ten statement items were included in the questionnaire to find out student responses about implementing the self-reliance video project. The statement is divided into four indicators regarding independent learning outside the classroom, application of knowledge, increasing student motivation, and student dependence on teachers. The results of students' responses to independence are shown in Table 2.

Table 2. Student responses to independence

Statement	Mean	Category
Video projects seek more knowledge outside of the classroom	4.32	High
Video projects help to gain knowledge	4.35	High
Video projects help develop learning independence	4.36	High
The video project make more responsible for studying	4.39	High
1.1.5. trying to figure out to know myself while working on a video project	4.22	High
apply knowledge from the classroom when I work on video projects	4.08	High
After completing the video project can study efficiently outside the classroom alone	3.65	High
Need the instructor's help with a few things when working on a video project	3.85	High
Considered the instructor's suggestions about the video project	3.85	High
When there is a problem working on a video project,	3.65	High

Based on Table 2, all items are included in the high category, with a score range between 3.65-4.49. student responses are positive towards the implementation of video projects and have a high impact on learning independence. Positive response because students rarely get project-based learning. Video projects during lectures are asynchronous. The implementation of the video project provides an opportunity for students to explore themselves to find out and learn the concepts of Acid-Base that have been studied previously at the high school level. In addition, the implementation of video projects can support activeness and independence in learning [19]. Furthermore, students' responses to the independence aspect of each indicator are shown in Figure 1.
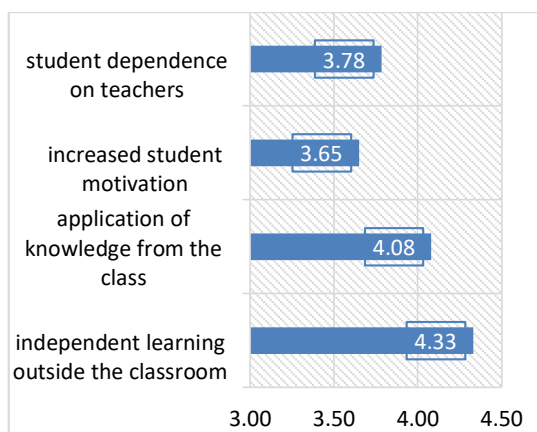

Figure 1. Graph of the Aspects of Independence for Each indicator

Figure 1 shows the section with the highest average of independent learning outside the classroom. The second-highest part is the application of knowledge from the classroom, the dependence of students on the teacher, and the lowest part is the increase in student motivation. The implementation of video projects requires students to complete projects by seeking information independently from various learning sources outside the classroom. Project-based learning emphasizes applying knowledge gained from class when solving problems on daily live phenomena to encourage active participation and creativity of students. Project-based learning can reduce dependence on the instructor because the instructor is only a facilitator. Students are openly allowed to complete the given project independently. Based on curiosity to find solutions to the problems presented, it can increase student learning motivation. Student learning motivation arises because students feel they are carrying out a role like a researcher [20].

2. Student Response to Cooperation

Besides individual responsibility for making video projects, students are also asked to complete tasks in groups. Collaboration in groups is required to complete a video project. When in groups, all members respect each other's opinions and exchange information to find solutions. The value of cooperation needs to be instilled in the learning process because it is useful in daily life.

Eight statement items were stated in the questionnaire to determine student responses about implementing the video project on collaboration. The statement is divided into six indicators, cooperation in groups, developing self-confidence, sharing knowledge, making decisions, solving problems, and self-evaluate after receiving feedback from others. The results of student responses to cooperation are shown in Table 3.

Table 3. Student Responses to Cooperation

Statement	Mean	Category
Video projects allow me to work with other people as a team	3.72	High
Video projects enhance collaboration skills with others	3.84	High
A stimulating video project to dare to say what's in mind	4.27	High
Video projects allow interacting more with my friends outside of the classroom	3.91	High
The video project encourages me to exchange knowledge with my friends	4.03	High
Can make decisions about how to do video projects	4.08	High
When there is a problem doing a video project, my friends and I can solve it together	4.08	High
Learn explaining skills from a friend's suggestion while doing a video project	4.00	High

Based on Table 3, it can be seen that all items are included in the high category, with a score range between 3.72-4.27. It means that student responses are positive towards implementing video projects and have an essential influence on working with others. The positive response was related to group friends' help when they faced difficulties in completing the project. When students feel positively interdependent with the group's friends, students learned not only for themselves but also for interest groups [21]. Furthermore, student responses to aspects of cooperation in each indicator are shown in Figure 2.
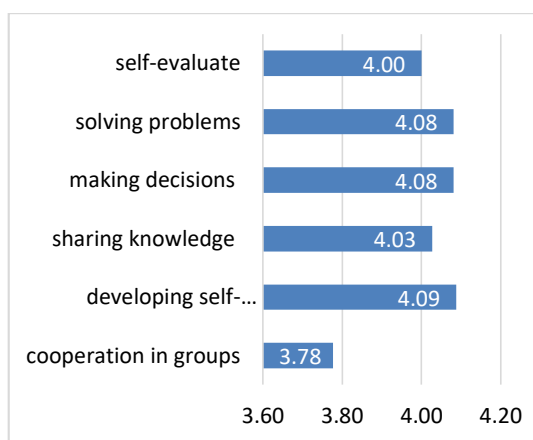

Figure 2. Graph of the Aspect of Cooperation in Each Indicator

The section that has the highest average is about developing self-confidence. Implementing video projects can increase self-confidence because students can express ideas widely to create maximum content [22]. The next section is on the part of decision making and problem solving. Decision making by group discussion to solve a given problem and requires the active role of all members. To complete a video project, students need to engage in decision making, think critically and work closely with group members to ensure a successful production [23]. The third place is in sharing knowledge. Sharing knowledge between teams encourages team members to share information, experiences, and opinions about certain tasks [24]. The interaction between group members and the exchange of opinions can improve understanding of the concept of Acid-Base. The fourth place is self-evaluation. Differences of opinion between group members during group discussions can detect deficiencies in understanding the concept. The last order is cooperation in groups. The success of the group will depend on the cooperation between group members to achieve common goals[25].

Despite being in the previous position, the positive response is still in the high category. Collaboration with other students can improve thinking and deep

understanding of the ideas found because students are involved in completing project assignments. Good cooperation and fair division of functions in one group will also produce satisfying videos. Project-based learning can instil the cooperative attitude needed in daily life and have an impact on student achievement.[26].

3. Student Response to the Use of Technology

Distance learning requires technology because all online learning requires media. Using technology for educational purposes may have other repercussions, as some people are unfamiliar with technology. The results of student responses to the use of technology are shown in Table 4. Based on Table 4, it can be seen that all items are included in the high category, with a score

range between 3.51-4.53. Students' responses are positive on implementing the video project and have an important influence on the use of technology. The highest score in using technology is about improving skills in using applications, with a score of 4.53. Making video projects using the application requires students to learn first before applying it to making videos. Students look for information from the internet or ask friends for help when they face technical problems making videos and improving digital literacy. While the lowest average with a value of 3.51 is about students' concerns because they are not used to using technology. Students feel challenged to work by utilizing technology because previously, they were rarely involved with this technology [18].

Table 4. Student Responses to the Use of Technology

Statement	Mean	Category
Video projects made to improve skills using the application	4.53	High
Working with technology sometimes makes me nervous	3.51	High
Support the use of technology such as video projects for educational purposes	4.31	High
More projects with the technology used should be assigned to students to improve digital literacy	3.99	High
Continue to undertake similar projects involving the technology in the future.	4.03	High

Currently, the campus world's development, especially students, must-have smartphone devices distributing videos. Thus, editing videos is a skill that students must have. In addition, now that most scientific journals are online, there is an increasing trend to include videos in journal articles, and there are even online journals featuring videos of scientific procedures [16]. In turn, it results in a more entertaining and exciting experience for them [27]. This research reinforces the usefulness of student-generated videos to develop course-

specific knowledge, develop practical and social skills such as presentation skills and information technology [28].

From this study, students generally think positively and are passionate about video projects. There were doubts at the start of a video project due to a lack of experience and video composing skills. However, video projects can attract students' creativity in integrating digital literacy and cooperative learning [23]. Video projects have potential as alternative assessments that can be used in distance learning. In the absence of face-to-

face meetings, an assessment instrument is needed that can authentically assess student work. Video-based assessment is part of an educational institution's teaching and learning strategy [29]. Ensure technical support, resources, infrastructure and assessment rubrics [30].

CONCLUSION

Based on the research and discussion results, it can be concluded that students positively responded to the implementation of the video project in terms of independence, cooperation, and technology use. The implementation of video projects can train learning skills, collaboration, and digital literacy independently, even though students have difficulty making videos because they are not used to learning. The suggestion for further research is that students need to be accustomed to using technology-based media. Further research is required to determine the effectiveness of video projects on student learning outcomes.

.

REFERENCES

[1]   V. Sima, I. G. Gheorghe, J. Subić, and D. Nancu, "Influences of the industry 4.0 revolution on the human capital development and consumer behavior: A systematic review," *Sustain.*, vol. 12, no. 10, 2020,
doi:10.3390/su12104035

[2]   R. S. Malik, "Educational Challenges in 21St Century and Sustainable Development," *J. Sustain. Dev. Educ. Res.*, vol. 2, no. 1, p. 9, 2018,
doi:10.17509/jsder.v2i1.12266

[3]   N. Trends, R. Analysis, E. V Frolova, O. V Rogach, T. M. Ryabova, and R. Federation, "Digitalization of Education in Modern Scientific Discourse: New Trends and Risks Analysis," *Eur. J. Contemp. Educ.*, vol. 9, no. 2, pp. 313–336, 2020, doi: 10.13187/ejced.2020.2.313

[4]   H. Budiman, "Peran Teknologi Informasi Dan Komunikasi Dalam Pendidikan," *Al-Tadzkiyyah J. Pendidik. Islam*, vol. 8, no. 1, p. 31, 2017,
doi: 10.24042/atjpi.v8i1.2095

[5]   R. Pakpahan and Y. Fitriani, "Analisa Pemanfaatan Teknologi Informasi Dalam Pembelajaran Jarak Jauh Di Tengah Pandemi Virus Corona Covid-19" *Jisamar (Journal of Information System, Applied, Management, Accounting and Researh)*,vol. 4, no. 2, pp. 30–36, 2020.

[6]   S. Ferdiana, "Persepsi Mahasiswa tentang Penggunaan Media Daring pada Program Studi S1 Ilmu Gizi Sekolah Tinggi Ilmu Kesehatan Surabaya selama Masa Pandemi Corona Virus Disease (COVID-19)," *Indones. J. Sci. Learn.*, vol. 1, no. 1, pp. 5–12, 2020.
doi:10.15642/ijsl.v1i1.631

[7]   D. Sawitri, "Penggunaan Google Meet Untuk Work From Home Di Era Pandemi Coronavirus Disease 2019 (Covid-19)," *Prioritas J. Pengabdi. Kpd. Masy.*, vol. 2, no. 01, pp. 13–21, 2020,

[8]   G. Demircioğlu, A. Ayas, and H. Demircioğlu, "Conceptual change achieved through a new teaching program on acids and bases," *Chem. Educ. Res. Pract.*, vol. 6, no. 1, pp. 36–51, 2005,
doi: 10.1039/B4RP90003K.

[9]   M. I. M. Damanhuri, D. F. Treagust, M. Won, and A. L. Chandrasegaran, "High school students' understanding of acid-base concepts: An ongoing challenge for teachers," *Int. J. Environ. Sci. Educ.*, vol. 11, no. 1, pp. 9–27, 2016,
doi: 10.12973/ijese.2015.284a.

[10] I. Yohana, S. Sudarmin, S. Wardani, and S. Norashikin, "The generic science skill profile of fourth grade

students on acid and base topic in guided inquiry learning model," *Int. J. Act. Learn.*, vol. 3, no. 2, pp. 110–116, 2018.

[11] F. Firman and S. Rahayu, "Pembelajaran Online di Tengah Pandemi Covid-19," *Indones. J. Educ. Sci.*, vol. 2, no. 2, pp. 81–89, 2020, doi: 10.31605/ijes.v2i2.659.

[12] I. B. Siwa, I. W. Muderawan, and I. N. Tika, "Pengaruh Pembelajaran Berbasis Proyek dalam Pemebalajaran Kimia terhadap Keterampilan Proses Sains ditinjau dari Gaya Kognitif Siswa," *e-Journal Progr. Pascasarj. Univ. Pendidik. Ganesha*, vol. 3, no. 3, pp. 1–13, 2013.

[13] D. Masats and M. Dooly, "Rethinking the use of video in teacher education : A holistic approach," *Teach. Teach. Educ.*, vol. 27, no. 7, pp. 1151–1162, 2011,
doi: 10.1016/j.tate.2011.04.004

[14] C. A. Hafner and L. Miller, "Fostering learner autonomy in English for science: A collaborative digital video project in a technological learning environment," *Lang. Learn. Technol.*, vol. 15, no. 3, pp. 68–86, 2011.

[15] L. Nikitina, "Student Video Project As A Means To Practice Constructivist Pedagogy In The Foreign Language Classroom.," *J. Educ. Educ. Pendidik Dan Pendidik.*, vol. 24, 2009.

[16] L. Benedict and H. E. Pence, "Teaching Chemistry Using Student-Created Videos and Photo Blogs Accessed with Smartphones and Two-Dimensional Barcodes," no. i, pp. 10–14, 2012,
doi: 10.1021/ed2005399

[17] H. H. Batubara, "Penggunaan Google Form Sebagai Alat Penilaian Kinerja Dosen Di Prodi Pgmi Uniska Muhammad Arsyad Al Banjari," *Univ. Islam Kalimantan MAB*, vol. 8, no. 1, pp. 40–50, 2016.
doi: 10.14421/al-bidayah.v8i1.91.

[18] A. Puspa and S. Syahrial, "The Students' Responses on the Implementation of Student-Made Video Project in ESP Classroom to Train 21st Century Skills," vol. 110, no. Iselt, pp. 57–63, 2017, doi: 10.2991/iselt-17.2017.11.

[19] D. S. Rahayu, "Respons Mahasiswa Terhadap Pembelajaran Berbasis Proyek Pada Mata Kuliah Statistika," *J. Pendidik. dan Pembelajaran Mat.*, vol. 2, no. 2, pp. 14–24, 2017. doi: 10.29100/jp2m.v2i2.202.

[20] D. Insyasiska, S. Zubaidah, and H. Susilo, "Pengaruh project based learning terhadap motivasi belajar, kreativitas, kemampuan berpikir kritis, dan kemampuan kognitif siswa pada pembelajaran biologi," *J. Pendidik. Biol.*, vol. 7, no. 1, pp. 9–21, 2017. doi: 10.17977/um052v7i1p9-21

[21] G. Jacobsa and P. Seow, "Cooperative Learning Principles Enhance Online Interaction1," *J. Int. Comp. Educ.*, vol. 4, no. 1, pp. 28–38, 2015,
doi: 10.14425/00.76.07

[22] S. Sumardi, R.' Adzima, and A. N. Wijaya, "Digital Video Project: An Authentic Assessment to Assess Students' Speaking Skills," *Indones. J. EFL Linguist.*, vol. 5, no. 1, p. 57, 2020,
doi: 10.21462/ijefl.v5i1.217.

[23] N. C. Ting, "Classroom Video Project: An Investigation on Students Perception," *Procedia - Soc. Behav. Sci.*, vol. 90, pp. 441–448, Oct. 2013, doi: 10.1016/j.sbspro.2013.07.113.

[24] S. Jamshed, M. Nazri, and R. Abu Bakar, "The Effect of Knowledge Sharing on Team Performance through Lens of Team Culture," *Oman Chapter Arab. J. Bus. Manag. Rev.*, vol. 7, no. 3, pp. 64–80, 2018, doi: 10.12816/0049504.

[25] P. Sami, U. Sabri, M. Ilyas, and Z. Amjad, "Organizational Culture and Its Impact on the Job Satisfaction of the University Teachers of Lahore Pirzada Sami Ullah Sabri," *Int. J. Bus. Soc. Sci.*, vol. 2, no. 24, pp. 121–129, 2011.

[26] Y. D. Haryanti and U. Majalengka, "Internalisasi Nilai Kerjasama Dalam Model," vol. 1, no. 1, pp. 1–11, 2020, doi: 10.37729/jpd.4.

[27] J. Gillanders, K. O'Brien, S. O'Leary, A. Perez-Gavilan, and James Sheridan, "A How-To Guide for Student Generated Video," pp. 0–8, 2019,

[28] C. Orús, M. J. Barlés, D. Belanche, L. Casaló, E. Fraj, and R. Gurrea, "The effects of learner-generated videos for YouTube on learning outcomes and satisfaction," *Comput. Educ.*, vol. 95, pp. 254–269, 2016, doi: 10.1016/j.compedu.2016.01.007.

[29] C. Jorm, C. Roberts, C. Gordon, G. Nisbet, and L. Roper, "Time for university educators to embrace student videography," *Cambridge J. Educ.*, vol. 49, no. 6, pp. 673–693, 2019, doi: 10.1080/0305764X.2019.1590528

[30] R. Hawley and C. Allen, "Student-generated video creation for assessment: can it transform assessment within Higher Education?," *Int. J. Transform. Res.*, vol. 5, no. 1, pp. 1–11, Feb. 2019, doi: 10.2478/ijtr-2018-0001.