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muhhammad.reza@ar-raniry.ac.id**EVALUATION OF CHEMISTRY LEARNING VIDEOS FROM ONLINE LEARNING APPLICATIONS IN INDONESIA****Muhammad Reza^{a*}, Nurmalahayati Nurdin^a, Naila^a, Wilda Puspita Sari^a,**^aDepartment of Chemistry Education, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Ar-Raniry Banda Aceh, 23111**Abstract**

E-learning is not distinct from the use of technology, which includes a variety of digital platforms. Zenius, Ruangguru, Pahamify, and other online learning systems are currently available in Indonesia. There are various learning films on the learning platform, such as on the applications B and C, which both give a variety of features and materials that complement the curriculum K-13, particularly in chemistry. The qualitative descriptive methodologies were used in this investigation. The purpose of this research is to compare the quality of chemistry learning resources available on online learning applications that correspond to the 2013 curriculum. Data is gathered through the downloading and video monitoring of chemical compounds. Two learning apps, B and C, were utilized as examples. According to the findings of this study, application B has a bigger number of videos in the material than application C. In addition, the average video time on the B app is less topical than on the C app. A good learning video has an appropriate length. When the video is too long, the spectator becomes bored. The video's attributes should be clear, and a pleasant appearance, such as animation, can encourage students to follow.

Keywords: *E-learning; Online tutoring; Curriculum of 2013; Video*

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INTRODUCTION

People benefit immensely from technological advancements in education, namely the transition from traditional learning systems to digital forms. Because of the settings and situations that necessitate the presence of e-Learning, e-learning programs are currently a hot topic of discussion among educators, parents, and students. E-learning is a type of electronic learning material that is oriented on the student and is based on information technology. Some of which students can search and receive information and can access learning materials very readily and rapidly, with the existence of e-Learning is predicted to boost students' cognitive capacities. The use of e-learning is not only applied for theoretical learning, but also for practical learning. Previous research found that the students are interested in learn chemistry practicum using e-module [1]. In-e-learning is more than merely displaying learning materials in the form of words, powerpoint, html, or PDF. However, there are virtual courses between teachers and students so that educators and students can engage, and there is also a virtual laboratory by giving a variety of learning media such as animated graphics so that teachers can easily convey the learning content [2], [3].

Since the Covid-19 (Coronavirus Disease) pandemic at the end of 2019, most countries around the world have implemented remote care systems with others. In Indonesia, the Minister of Education and Culture of RI, Nadiem Anwar Makarim,

announced that in 2020, there will be a periodic spending of 6 points on learning techniques, which will be carried out at home throughout the epidemic of learning processes [4]. As a result, e-learning can be employed as a solution for learning during pandemics. E-learning can be developed in form of students worksheet [5], e-module [1], questions bank [6], [7], and integrated module or books [8].

On learning e-learning, there are certain issues that develop, one of which is that teachers and students are still publically opposed to technological competence, causing the teaching learning process to fail. Schools still have Internet and electrical constraints, so teachers must be more innovative in the face of the covid-19 virus pandemic [9]. E-learning is not distinct from the use of technology, as there are numerous digital platforms [10]. In Indonesia, there are currently a number of online learning platforms such as Google Classroom, Zenius, RuangGuru, Pahamify, and others that are used to facilitate online learning that is still being used even though the pandemic period has begun to end in most countries around the world.

A technology-based education platform, one of which is the application B, provides subjects from elementary school to high school that has 15 elementary-to-School level pupils and has 80,000 learning videos accessed via the internet, there is also a whiteboard format with recordings made by teachers, and there is also a live teaching facility with a live chat feature, so that interaction between teachers and pupils is created [11].

The next technology-based education platform is the C app, which improves excellent content so that it may be accessed by all students in Indonesia via smart exercises. According to the program's motto "Learn So Call," this C software aims to provide fun learning through gamification tactics. The C app has over 3,000 high-quality video clips for high school students, as well as over 10,000 quizzes, summaries, and test-out exam preparations, as well as sketches and discussions [12]. Other research suggests that the app is appropriate for use in learning because it is accessible, free, and user-friendly, and that it can increase learning outcomes [13], [14]. The quality and convenience criteria show that the application platform A is on the first level, followed by the second application B, the third application D, and the fourth application C [15].

The curriculum currently in effect at the school is Curriculum 2013, which includes in Indonesia applied e-learning learning. This learning focuses on students and teachers as facilitators, and students are encouraged to be active participants in their own education. Also emphasized on the e-learning platform are the development of students' competencies and character. Consequently, instructors must be able to design effective and meaningful learning. One of the subjects taught in secondary school is chemistry. Students consider chemical subjects to be demanding and difficult to comprehend [16]-[18].

There are a number of instructional videos on the learning platform, such as those for applications B and C, which both provide a variety of features and materials that align with the 2013 curriculum, particularly in chemistry. Previous research demonstrated that the Ruangguru application as one of the online learning features in Indonesia meets both the human and technological standards for use by students [19], but this analysis concentrates only on the application's features and computer design [20]. Moreover, studies of teacher efficacy in delivering learning materials in Ruangguru applications reveal variations that can enhance student engagement with teachers while learning online [21]-[23]. No advanced studies have examined the effect of video duration and quantity on student learning characteristics. The purpose of this study is to compare learning applications based on the number and duration of videos related to the 2013 curriculum-aligned quality of the structure of the chemical material arrangement.

METHOD

Methods that describe quality are used in this work. Qualitative research is used to look into a scientific item. The researcher is the most important tool in this type of research. This study is descriptive, and it comes up with a word that can be grouped as an image that can be backed up [24]. The purpose of

descriptive qualitative research is to document the accuracy or validity of the collected data and to expand the data analysis measures and techniques used to present data, interpret data, validate research results, and demonstrate their potential. Primary and secondary data were utilized for this study. Primary data are the data that are the primary focus of analysis, whereas secondary data are data that are used to supplement and compare primary data [21]. The quantity and duration of videos from learning application B are the primary data, while the quantity and duration of videos from learning application C are the secondary data. During periods of pandemic, App B provides free online schooling services. The similarities between these two learning applications include live instruction, conversation, regular video learning, video learning enrichment, and topical discussion. However, the C app lacks animated videos and summary capabilities.

RESULTS AND DISCUSSION

Implementation of learning curriculum In 2013, more emphasis is placed on character education for students. The student's character is formed by the way he perceives, hears, feels, and acts. The development of curriculum in pandemic times, teachers provide online learning materials and students can learn them independently, such as from teachers' guidance books, student textbooks [25], and can use available technologies such as online e-learning platforms, such as the B and C applications that contain a variety of subjects, different classes, even school levels, video-shaped learning materials, summaries, quizzes, and flashcards.

The material developed for the e-learning platform must measure the student's knowledge, skills, and mastery of the material against the established standards of competence. The developed educational theory is not separate from the instructional materials. The learning materials are organized in a logical and systematic manner, extending from theories, concepts, generalizations based on particulars, key concepts, procedures, terms, and examples. Technology throughout the globe Education on learning materials is more specific and objective regarding its components and sub-subjects [26]. It can be written in the form of a script or video that can be used as reading material and as a perspective on school subjects or as a means of knowledge enhancement [27], [28].

The e-learning platform's instructional materials are video-based. Video is a form of visual audio that includes images, sounds, and animations that can be viewed directly and repeatedly by students in order to increase lucidity and interest in learning. Materials in Applications B and C correspond to the fundamental skills taught in each subject. This can be seen in the wide variety of class X raw materials, which range from KD 3.6 to KD 3.10. Such competence-related content is

already present in the B and C applications, and it is even continuously updated in the most recent content on the B application, with sub-sub-sub content division, thereby increasing the number of videos. To add clarification that describes the comparison of the number of recordings contained in class X's B and C materials for chemical applications as follows.

Table 1. Number of videos in Chemistry subject of grade 10

Materials (KD)	Number of Videos	
	Application B	Application C
Nature of chemistry	22	7
Atomic Structure	40	3
Electron Configuration	5	8
Periodical Table	23	6
Chemical Bonding and VSEPR Theory	47	16
Electrolyte and Nonelectrolyte	8	3
Redox Reaction	12	5
Naming chemical compound	14	3
Fundamental Laws of Chemistry	13	2
Stoichiometry	37	18

Table 1 demonstrates that the quantity of video learning in app B is greater than that of app C. This is due to the fact that the application B includes a greater number of subtopics, such as the material development of atomic structures, chemical bonds, and fundamental laws of chemistry. Following chunking strategies in microlearning [29], topics are subdivided into more subtopics. Micro learning accentuates the sequence and content of extremely detailed materials, thereby enriching the learning experience. This strategy is employed very effectively, particularly in online learning [30]. Reviewing the conformity of the structure of chemical materials in the 2013 curriculum, the B and C video application installed its study material that already includes KD that corresponds to the currency in 2013. However, the positioning of the material video differs, such as material that should be printed in the KD but is instead printed in the sub-sub material. In the application C on the material of the same name, for instance, the fundamental laws and stoichiometry are incorporated into a single learning video.

There is a short-lived material deliverance in the video learning. In each instructional video, the duration range must be observed. The duration correspondence describes the objectives and learning materials to be attained. There are three varieties of video duration: short video, semi-short video, and long video [31]. On the implementation of

online learning guidance B and C, each material has a different duration to be attained, because each learning video material is more detailed and clarified and facilitates learners' comprehension. The average duration (in minute) of videos analysed in this research is depicted by table 2.

Table 2. Average duration of videos of grade 10

Materials (KD)	Duration (Minutes)	
	App B	App C
Nature of chemistry	6.16	8.37
Atomic Structure	5.51	9.35
Electron Configuration	6.34	7.59
Periodical Table	6.53	9.00
Chemical Bonding and VSEPR Theory	6.00	8.35
Electrolyte and Nonelectrolyte	6.26	8.35
Redox Reaction	5.47	7.25
Naming chemical compound	8.28	9.08
Fundamental Laws of Chemistry	7.46	5.32
Stoichiometry	7.33	6.32

The graph in Table 2 comparing the average durations of applications B and C reveals that applications B have a shorter duration than applications C. This is because the B app contains a greater quantity of video recordings, resulting in a shorter average duration. The duration of these online learning applications is comparable. 5 to 6 minutes or 20 minutes is the optimal learning length for a video. When the material is sufficiently presented, it is preferable to have a small number of videos to keep the students' attention [18].

In the delivery of chemical material on the application B, for instance, only the electrolyte and non-electrolyte materials are broken down into multiple video segments for each subtopic. This is intended to make the video of learning material easier to comprehend and less monotonous when viewed. While the number of C applications per topic is relatively small, the average duration of the video used to present the material is lengthier than usual because it covers all of the material's content in that time. To increase learning motivation, attention must be paid to the clarity of the presented materials so that they can be readily comprehended, as well as the use of simple and general language. Then the content of the material accurately represents itself, along with high video quality. Animated videos are also required because they contain images, music, text, and audio that complement difficult-to-understand chemistry [31].

Characteristics of video learning in the delivery of content in which a mentor or educator initiates learning

by actively practicing examples of the material in everyday life. The language used by educators to convey the material is straightforward, simple, and commonly used in daily life. The language used by the teacher will determine the level of engagement of the video audience (students) in the online learning process, with students preferring less formal language because it eliminates the image of robots and computers in online learning using learning applications [32]. In the video learning educators use dynamic intonation, tone intonation, and tempo intonation. Educators typically move their appendages or mimic actions such as raising their hands, etc. when explaining. At the time of explanation, teachers frequently use words in the form of questions to capture the attention of the student or audience, and in educational videos, teachers explain clearly, tightly, firmly, and clearly so that the student can comprehend the learning material with ease. Teacher appearance, the ability to convey content in video, and voice intonation are crucial components for the success of online video-based learning [33].

The characteristics of application B in the delivery of material for video learning begin with real-world examples, followed by direct explanations, and then begin with material explanations by associating real-world examples and historical philosophers, such as Democritus' atomic theoretical material. The mentor's explanation in application B includes several criteria, such as the use of the pen tab, the animation of the image, and the description of the image using the pen tab. The educator also uses a dashboard that examines the mentor's expression in relation to the audience. So that the audience can see the images and writings of the mentors. As in general, the direction in which the teacher writes on the screen distinguishes learning in the classroom. Rarely does a mentor or educator terminate a video because the video is segmented. These brief videos are intended to prevent students from becoming fatigued while studying. This is one of the chunking strategies that is anticipated to assist students with diverse cognitive abilities in adjusting their learning pace [34], [34]. B employs clear, explicit language and a common, easy-to-understand language in the delivery of application materials so that students can comprehend the material delivered by mentors and educators. In addition, educators who do not use pentab have a mimic style and are not silent in the classroom, as they move their hands similarly to instructors. Using pentab while provided online teaching help students to feel real class (offline class) [7]. The B and C applications have high-quality video that can be seen and heard by viewers. In this instance, learning using this second e-learning platform can make students more active and add insight, as well as increase the availability of materials when students enter the classroom.

CONCLUSION

Technological advancements that penetrate the world of education facilitate the implementation of learning and work for both students and teachers. For example, the technology that is developing in the world of education today is the e-learning platform of online learning guidance, such as the applications B and C, where the applications have a variety of features that can be easily accessed, such as subjects, class levels, video learning materials, and quizzes. Video instruction that includes material explanations already satisfies the requirement for fundamental knowledge of the subject matter. This is evident from the fundamental material contained in the online learning applications B and C, which are already complete, as well as the submaterial and package book. With video-based learning materials, students can expand their knowledge and elucidate their comprehension of difficult concepts. An excellent instructional video has the optimal length. Because when the majority of the duration causes observer boredom. The video should have clear characteristics and a decent appearance, such as animation, in order to attract the attention of the students.

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