The Effectiveness of Khan Academy as a Science Learning Support to Improve Student's Mastery of Skills : Literature Review

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Abstract

This article aims to analyze the effectiveness of using the Khan Academy platform as a support for science learning during the Covid-19 Pandemic to improve students' mastery of online learning skills. Online learning is one of the impacts caused by the spread of Covid-19 in the field of education. This condition causes teachers to use digital technology such as platforms to support the learning process. The integration of Khan Academy in science learning is a breakthrough in delivering learning materials that are in accordance with the applicable curriculum with consideration of material from teachers that is applied online. In this case, the teacher can designate the material according to the mastery of the skills students have. Then students can carry out activities to analyze video tutorials, work on practice questions to do practicum according to the instructions in Khan Academy. Teachers and parents can also monitor and supervise the activities, abilities and mastery of students' material. Based on the literature review, Khan Academy helps in classroom management, practicum activities through video tutorials, and practice questions and activity monitoring as an effective student progress report.

INTRODUCTION

Currently, the COVID-19 pandemic is still engulfing various countries, one of which is Indonesia. This pandemic period forces all activities, especially in educational institutions to maintain a distance with all material delivery being diverted through online media. Thus, online learning by utilizing digital technology has become an innovation and breakthrough during the pandemic (Widiyono, 2020) in an effort to improve the quality of learning (Sarip *et al.,* 2020). Online learning modifies collaborative, adaptive learning and applies the teacher's role as a facilitator (Fiqry, 2021). In online learning, the integration of the use of digital technology is able to facilitate the learning process as a supporting medium and a means of obtaining an overview to improve the quality of education (Makiyah *et al.,* 2019) and support the improvement of 21st century skills (Dash, 2019).

The application of technology in learning helps teachers and students understand material that is abstract and requires more reasoning (Yuniarti dan Hartati, 2020). In its application, there are several online learning platforms, in the form of applications, websites, social networks and Learning Management System (LMS) (Faturohman, 2020). The platforms that can be used to support online learning, such as Moodle, Edmodo, Blackboard, SEVIMA, EdLink, Schoology, and Google Classroom (Widiyatmoko, 2021) and Khan Academy (Soebagyo, 2016). One of the platforms that can be used to support online learning in science and mathematics is using Khan Academy. In its application, the Khan Academy platform is the choice in an effort to improve the quality of education in online learning (Soebagyo, 2016). This platform was launched in 2006 by a non-profit company which is now the most popular Education site in the world (Hernawati, 2012).

The implementation of science learning through Khan Academy is able to support the creation of effective, efficient and fun learning for students. So that students are actively involved in learning in accordance with the main goal of the online learning process that realizes student-centered learning. This learning process is able to build students' critical and creative thinking and increase students' independence and motivation to learn (Monteiro *et al.,* 2015). Through a review of the Khan Academy application literature, both the academic community, students and parents will understand the effectiveness of the platform.

METHOD

This paper contains data from literature study. This analysis includes research that has been published with relevance discussing the application of Khan Academy as a science and mathematics learning platform that helps increase student motivation, especially during the Covid-19 pandemic. The investigation in this analysis was carried out by reading and studying various literatures in the form of articles obtained through the database (google scholar) related to the problems that became the object. The method used is a qualitative method with a descriptive approach that shows the facts of a problem with the aim of getting a general understanding of social reality from the perspective of participants who include teachers and students.

RESULT AND DISCUSSION

Khan Academy Platform

Khan academy is a free online learning platform with various unique and interesting features that can help the teaching and learning process. One of the non-profit organizations engaged in education created Khan Academy with a mission to facilitate world-class education and can be accessed anytime and anywhere for free (K.A. Team). Khan Academy provides 5,500 learning videos, more than 10,000 practice questions that can support students' knowledge. In addition, Khan Academy also provides coaching features which include materials to guide teachers, tutors, parents and so on to meet student learning goals. This feature allows users to determine preferred material for students and automatically sends electronic alerts about new assignments and provides a dashboard that allows teachers to monitor student progress (Murphy *et al.,* 2015). The display of the Khan Academy platform is presented in Figure 2 and Figure 3.

In this case, with the various features that have been owned by Khan Academy, students use it to train and improve their ability to develop science knowledge both independently and in groups with classmates. The use of Khan Academy is an innovation to learn science skills with the online method, and helps overcome limitations in delivering material in previous lessons, and is able to be an alternative in monitoring student progress and achievement (Kumar & Bervell, 2019).
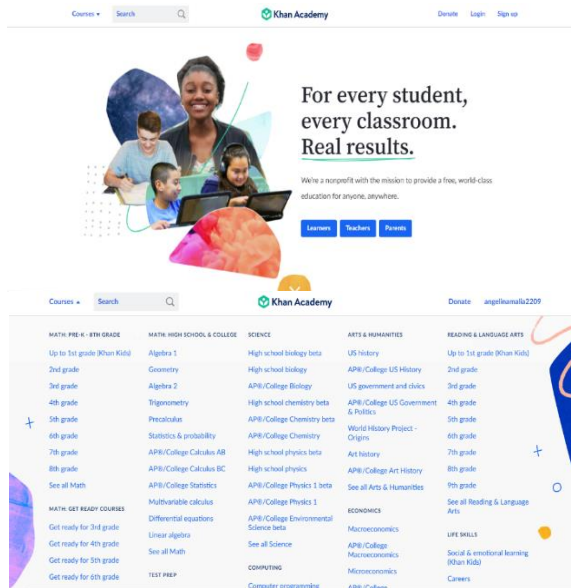
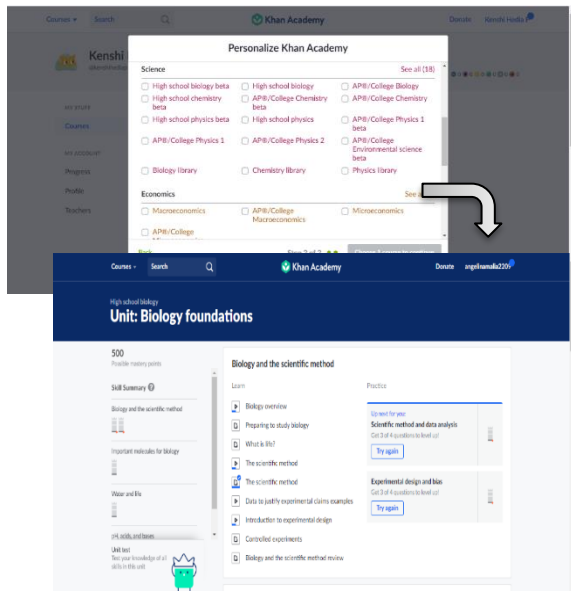Figure 2. Display of the Khan Academy

Figure 3. Material Detail View

Khan Academy Integration in Science Learning

The development of digital technology which is changing rapidly is able to support teachers in the teaching process in the classroom [14]. Moreover, now students have entered the digital era 4.0 where they are able to absorb various sources of information from technological innovations in every aspect of their lives. So that the integration of Khan Academy in science learning becomes a breakthrough in delivering learning materials that are in accordance with the applicable curriculum with consideration of material from teachers that is applied online. In this case, the teacher can designate the material

according to the mastery of the skills students have. Then students can carry out activities to analyze video tutorials, work on practice questions to do practicum according to the instructions in Khan Academy. In this case, the teacher can monitor and supervise activities, students' ability and mastery of material. In addition, through the features available in Khan Academy, parents can also participate in monitoring the development and activities of children in Khan Academy classes.

The steps that can be taken by teachers, students and parents in integrating Khan Academy in science learning are:

(1) The teacher makes a science (Science) class and invites students to join either directly or through class invitations in Google Classroom, the teacher makes considerations/recommendations to students regarding the material and practice questions, the teacher monitors student activity which includes reports on the progress of the skills mastered, performance based on level of mastery and skills of students. The display of making science classes in Khan Academy can be seen in Figure 4.
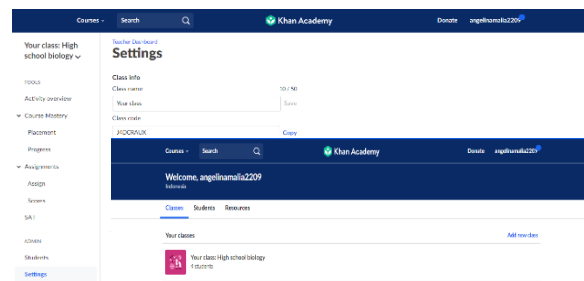

Figure 4 Creating a Science Class

Furthermore, teachers can monitor the progress of students' mastery of science skills through progress reports as shown in Figure 5.
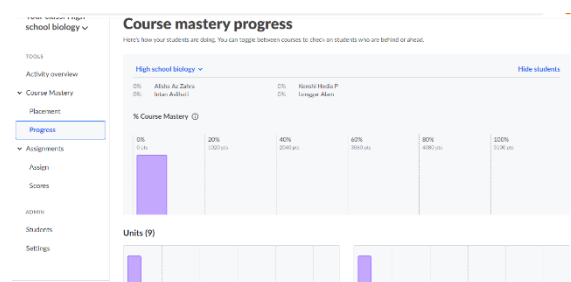

Figure 5. Student Progress Report

(2) Students carry out activities that have been recommended by the teacher, students can observe personal profiles containing reports of activity progress, accumulated points and energy collected based on activities that have been taken, level of mastery of skills in understanding a material, and the number of badges collected for certain achievements.
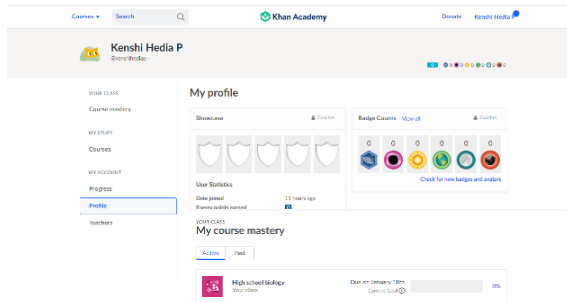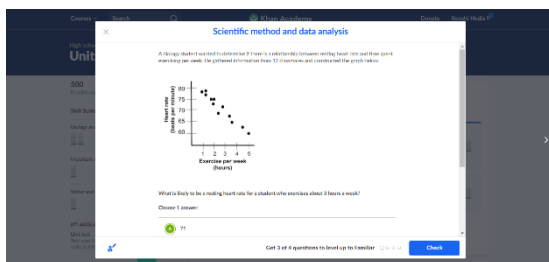

Figure 6. User Profile

Figure 7. Exercise question

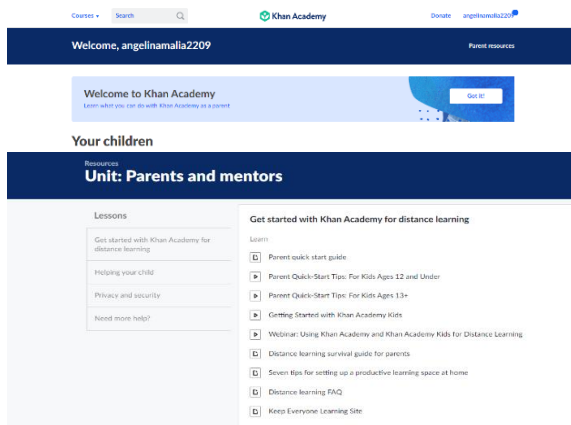(3) Parents can monitor the personal profile of their child and get guidance.

Figure 8. Display of Parents Features

CONCLUSION

Khan Academy is considered as an alternative learning platform solution to overcome obstacles in the delivery of effective science learning materials and improve students' mastery of skills during the covid-19 pandemic. The components that determine the success of the online learning system include students, teachers, parents, communication and digital technology used. Platform Khan Academy helps in classroom management, practicum activities through video tutorials, and practice questions and monitoring student activities as progress reports that can support online learning.

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