

# THE EFFECTIVENESS OF CHEMISTRY MEDIA LEARNING BASED ON AUTOPLAY MEDIA STUDIO 8.0 TO IMPROVE STUDENTS' COLLABORATIVE CHARACTER IN ACID-BASE MATERIAL

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Article Info	Abstract
<p><b>Received</b> : 27 May 2020  <b>Accepted</b> : 22 September 2020  <b>Published</b> : 22 October 2020</p> <hr/> <p><b>Keywords:</b> Effectiveness, Auto play media studio 8.0, Collaborative</p>	<p>This study aimed at discovering the effectiveness of auto play media studio 8.0 based chemistry media learning to improve the students' collaborative character in acid-base material in SMAN 6 Pekanbaru. A Purposive sample was used as a method of study using an analysis of Independent Sample t-Test. The obtained data were the observation results data during learning processes. The results of the study indicated that the use of auto play media studio 8.0 based chemistry media learning was effective and significantly improved the students' collaborative character, in which the significance value of Independent Sample t-Test was 0,000. Based on the average results of collaborative character before and after the use of chemistry media learning based on auto play media studio 8.0 increased by 71%.</p>

## INTRODUCTION

The 21<sup>st</sup> century is known as the century of knowledge, the knowledge-based economy century, the information technology century, globalization, and so on. In this 21<sup>st</sup> century, there are changes that very fast and unpredictable in all aspects of life i.e. economics, transportation, technology, communication, information, education, and others. Very fast changes can give opportunities or chances if it can be utilized well, yet it can be disastrous if not anticipated in a systematic, structured, and measured manner (I Wayan Redhana, 2019). Currently, teachers are urged to develop 21<sup>st</sup> century skills for the students in school especially in the core skill area (Communication, Collaboration, Critical Thinking, and Problem-Solving and Creativity and innovation) and special skills i.e. the use of Information, Communication, and Technology (ICT) (Ball et al., 2016).

ICT-based learning is important to be conducted so that the students are accustomed to newer developments of digital technology, of which developments are sophisticated, stable, and unreal; moreover, the students are also accustomed to present new challenges (M. J. Koehler, 2006). The teachers are accused to use more technologies in their teaching. Learning innovation needs to be developed and implemented to prepare the teachers who are ready to act as educators and researchers to encounter the challenges of the 21<sup>st</sup> century (Hendripides, 2018). The 21<sup>st</sup> century is the century of knowledge marked by the rapid development of information, communication, and technology (ICT). The development of ICT had a potential in changing the way of a person to learn and obtain information and provide opportunities for teachers to develop instructional techniques for maximum results (Roza et al., 2017). The use of learning media can overcome general obstacles that often occur in the learning processes such as limited hours in class, boredom in the learning process, and the complexity of delivering abstract material (Syaiful Bahri Djamarah, 2008).

ICT has a gap between those who have digital skills and those who do not, between those who have and do not have access to the digital environment. This difference is manifested in access, digital literacy, awareness, and the ability of individuals and organizations to use information technology as a means of production. Developing digital skills is a necessity today, because more and more functions are being carried out in the digital environment in the 21st century. As a revolutionary and interactive mass Medium, ICT affects society and culture, politics and economics, the public's right to know and the right to privacy, and censorship. It has caused the collapse of hierarchical information, equality of opportunity and social mobility, and for greater interpersonal and mass communication (Castells, 2009; Goyal, 2010; Hsieh et al., 2008; Sascha et al., 2011; Singh, 2008; Smith, 2009; Wang and Chan, 2008; Zilka, 2016). But research (Castells, 2009; Goyal, 2010; Hsieh et al., 2008; Livingstone and Sefton-Green, 2016; Losh, 2004; Sascha et al., 2011; Singh, 2008; Smith, 2009; Wang and Chan, 2008) It has been shown that despite its potential to advance disadvantaged populations, ICT is increasingly expanding their opportunities and limiting the gap between them and the prosperous population. The underprivileged population, disadvantaged in income, housing, and education, often far from the centers of education, business, and commerce, have little or no access to the ICT environment at present.

Behind the various advantages of ICT-based media also has shortcomings, especially if based on the internet. An international study conducted in 25 countries (Livingstone et al., 2012) shows that various risks apply to various age groups: children aged 8-12 face risks related to privacy and exposure to inappropriate content, while adolescents aged 12-17 face the risk of contacting strangers. Both children and adolescents can be confronted with harassment, cyberbullying, identity theft, hate speech, sedition, and racism (Annansingh and Veli, 2016; Gasser et al., 2010; Law et al., 2010; Livingstone et al., 2014 ). The easiest groups are children who are new to the internet, adolescents are actively seeking risks, and children and adolescents are defined as at risk due to reasons such as illness, parental death, behavioral problems, difficulty adapting, financial

problems, learning disabilities or others, cultural differences, immigration, belonging to a minority, transferring schools, living in problematic, dangerous, or poor neighborhoods, and more (Livingstone et al., 2012; Livingstone and Smith, 2014; Schilder et al., 2016; Zilka, 2016, 2015).

Rotherdam & Willingham (2009) note that the success of a learner depends on the skills of the 21<sup>st</sup> century; thus, the students must learn to have the skills. Learning efforts should be more directing the students so that they have a harmonious life such as living together with others, respecting each other's opinions, respecting people speaking, being responsible, willing to sacrifice, accommodating, and having a big spirit. The ways that are considered capable of driving the learning process like this are through collaborative learning. Collaborative character is very important in learning since it involves several students jointly joined in groups that recognize the differences in abilities and contributions of thoughts of each individual. The collaborative character is also reinforced by other characters i.e. communicative, discipline, etc. by using a good communication in learning, there will be a good collaboration since a good collaboration is made of good communication (Vivin Wulandari et al., 2019). Collaborative in learning can motivate the students thru a variety of interactions and knowledge to get a positive result for group and individual (Cheng, 2005; Ebrahim et al., 2009; Thoms, 2011; Xu et al., 2015). The collaborative character utilizes the diversity and group resources and also a difference in individual strength. When a collaborative learning and ICT-based media are combined appropriately, it will provide a positive result in graduate education, particularly in ICT-based learning (Astin, 1997; NSSE, 2003; Hansen, 2006; Antonis et al., 2011; Ku et al., 2013).

Chemistry is a part of natural science that studies the structure of matter and the changes that matter experiences in the scientific process and planned experiments (W. Keenan Charles et.al, 1990). Those material have a high degree of abstractness since it involves the microscopic nature and character of the atom; moreover, this requires the power of imagination to understand it. According to Chang (2005), most of the chemistry is experimental, and most of its knowledge comes from laboratory research. However, nowadays, chemists can use computers to study microscopic structures. Therefore, in order to understand this abstract concept, visualization is needed; thus, it looks as if it is real. Nana Sudjana and Ahmad Rivai (2007) postulate that the students will more easily receive the subject matter if it uses media that can be integrated into teaching and learning activities. The students have difficulty in understanding the invisible material concepts; hence, they need visualization so that the concepts become concrete.

Based on interviews with chemistry teachers at SMAN 2 Pekanbaru and SMAN 6 Pekanbaru, the teachers have a role as the main information provider in the learning process, in which they rarely use ICT-based learning media; therefore, the learning still relies on conventional methods. Additionally, the learning is still dominated by the students who have high abilities, so that the interaction only occurs between the teachers and the smart students. Meanwhile, students with a low level of ability are less involved in learning. This results in a lack of interaction between the students both within the group

and in the classroom in general. With the teacher as the main information provider, this also makes collaborative students in discussions not run optimally because of the low communication skills between the students. One material that often becomes a problem in learning chemistry is acid-base material. Acid-base materials are generally abstract which require deep understanding and require the students to be more focused on following the learning process so that the concepts described can be understood by the students.

One of the efforts that can be carried out to overcome the above problems is by developing a learning media that can attract the students' attention so as to facilitate the thinking process of students to understand the intent of the material presented and it can create independence on the students. The position of teachers in the era of industrial revolution 4.0 tends to be facilitators who provide the latest information related to scientific developments to the students from various sources; hence, the teachers must have competence in the technology and digital fields (Risky Setiawan et al., 2019). Azhar Arsyad (2011) asserts that the complexity of the material presented to the students can be simplified with the assistance of the media. One of programs that can be developed to be an interested learning media is Autoplay Media Studio 8.0 program.

The Autoplay Media Studio 8.0 is used since this application is in the form of a multimedia software by integrating various types of media i.e. text, images, voices, videos, texts, and flash into the presentation made (Kuswari Hernawati, 2010). Using integrated media skills like this will assist the process of knowledge construction in a game-friendly and game-oriented manner, and multiple sources of information, data processing programs, and many more (Ching et al., 2005; Hatlevik et al., 2015; Zilka, 2011, 2012, 2014, 2017).

Besides being sophisticated, Autoplay Media Studio 8.0 is also widely used since it is easier and it has very good quality learning media. The software of Autoplay Media Studio 8.0 can be used to develop multimedia application, Computer Based Training (CBT) application, system of AutoPlay/AutoRun menu CD-ROOM, presentation of marketing interactive, CD Business Cards, and so on (Hernawati, 2014). ). Further research conducted at Wilfrid Laurier University (1998) Canada (Surjono, 1999) found that students who use ICT-based media in their learning proved to be twice as fast learning time as classical students, 80% of these students perform well and very well, and 66% of them do not need printed material (hard copy). Other than that, research by Supriyono (2014) shows that the development of ICT-based learning media that is effective web is used in the learning process because it is able to increase the average student learning outcomes from 43% to 86% with a classical mastery level of 4% to 90 %.

## **METHODOLOGY**

This study used experimental method with a purposive sampling design involving two groups, namely experimental and control groups. Both groups were assumed to be the

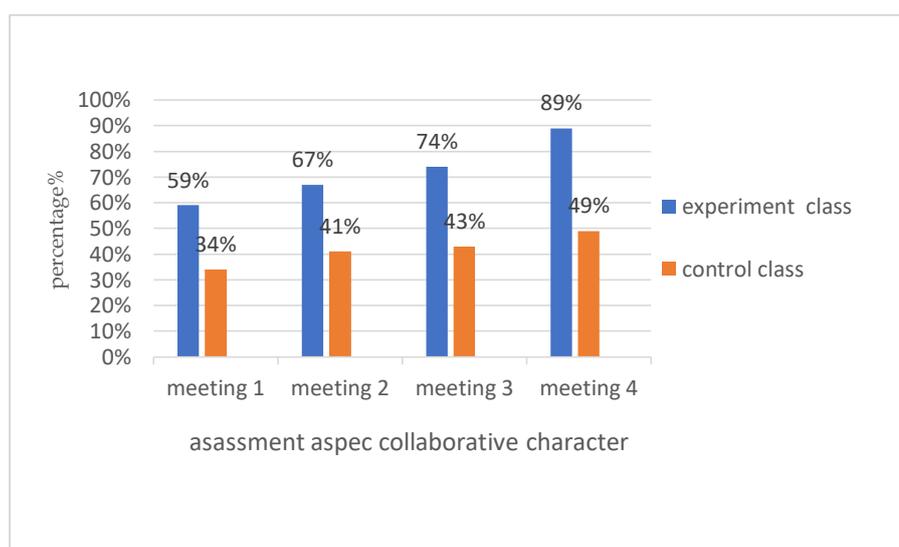
same in all relevant aspects and only differed in the treatment of learning media. The experimental group was given a treatment in the form of learning that chemistry media learning based on autoplay media studio 8.0, while the control class used PowerPoint media in acid base material.

Population of this study was the students of 11<sup>th</sup> grade in SMAN 6 Pekanbaru. From the population, 2 classes were taken as samples. Moreover, the two classes had an initial ability that was homogenous and normally distributed, namely 11<sup>th</sup> classes of Mathematics and Natural Science (MIPA) 3 and 5.

There were two data of this study that would be used for research purposes. Those data covered up the enhancement of students' collaborative character, of which data were gained by means of an observation. Prerequisite tests used in variance analysis were normality and homogeneity tests. Hypothesis of this study was that there is an increase of the use chemistry media learning based on autoplay media studio 8.0 to the students' collaborative character in acid base material. Hypothesis testing of this study used SPSS V 23 along with the independent sample t test which had stipulation that the Ho was received when the  $sign > 0,005$ .

## FINDINGS AND DISCUSSIONS

The results showed the collaborative character of students increased by using chemistry media learning based on autoplay media studio 8.0 compared to conventional media. The collaborative aspects of students in the experimental class were also higher than the control class at 71% while the control class was only 47.50%. Comparison of improvement between the experimental and control classes can be seen in Figure 1.



**Figure 1. Graphic enhancement of students' collaborative character**

The next step is to do a T Test on the data obtained. This test is carried out to see the significance of the character differences before and after the use of the product being developed. T test used was independent sample t test. T test results can be seen in table 1.

**Table 1. Results of the independent sample t-test collaborative character**

		<i>Levene's Test for Equality of Variances</i>		<i>t-test for Equality of Means</i>						
		<i>F</i>	<i>F</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Mean Difference</i>	<i>Std. Error Difference</i>	<i>95% Confidence Interval of the Difference</i>	
									<i>Lower</i>	<i>Upper</i>
Score	Equal variances assumed	.988	756	12,071	52	.000	51,519	4,268	42,954	60,083
	Equal variances not assumed			12,071	50,967	.000	51,519	4,268	42,950	60,087

T-test results using independent sample t-test showed that the significance was 0,000 <0.005 which showed that there were significant differences in the students' collaborative characters before and after the use of learning media based on autoplay media studio 8.0. meaning that  $H_a$  was accepted and  $H_o$  was rejected, namely a significant difference from the use of media learning media based on Autoplay studio media 8.0 compared to conventional media on the material. acid base. Chemistry media learning based on autoplay media studio 8.0 that was developed contains some activity instructions that lead students to carry out a series of communication activities. With this guidance the students will be motivated and encouraged to interact and communicate with both the teacher and fellow students. This is in line with the position of the learning media is as a learning component that can improve the interaction of teachers, students and the learning environment. Whereas in other learning media not given these instructions so that the interaction that occurs is only one-way interaction between teacher and student. These results are in line with Arsad Bahri (2018) that an increase in student learning outcomes from cycle 1 to cycle 2. In cycle 1, there were no students in the excellent category, 61.9% of students were in the good category and 38.1% were in the moderate category. While in cycle 2, there were 42.8% of students in the excellent category, 42.8% in the good category, 4.76 in the moderate category and 9.52% in the poor category. An increase in average student learning outcomes as a result of the use of learning media based on Autoplay Media Studio 8.

ICT-based interactive learning media design aims to clarify the presentation of messages and information and can overcome the limitations of the senses, space, time, and objects and objects that are too big or too small that are not visible to the senses that can be presented with the help of films, slides, videos, animations or pictures (Trianto, 2010). The use of elements in the form of text, graphics, images, photos, audio, video and animation in ICT-based learning media can illustrate the chemical concept that includes both macroscopic and microscopic aspects of study so that students can have complete mastery of concepts (Sadiman et al., 2011 ). Basically the design of ICT learning media refers to the use of technology in learning activities (Naidu, 2006). ICT-based learning media suitable for use as a learning tool that can access information on learning content, communication and interaction between teachers and students (Burgess and Ice 2011); (Sharma., et al, 2014). According to Davidson and Rasmussen (2006) there are several important aspects in the development of ICT-based learning media including the delivery of content and communication.

ICT-based learning is important so that students are accustomed to the development of newer digital technologies, which are sophisticated, stable, and unreal and are accustomed to presenting new challenges (M.J Koehler, 2006). Educators are required to use more technology in their teaching. Learning innovations need to be developed and implemented in order to prepare teachers who are ready to act as educators and researchers to face the challenges of the 21st century (Hendripides, 2018). The position of the learning media is as a learning component that can improve the interaction of teachers, students and the learning environment (K.A Peppler and YB Kafai, 2007). Learning media can accelerate the learning curve and can attract students' interest rather than just listening to the teacher's explanation (N. Kittidachanupap, et al. 2012). Another advantage of developing ICT-based media by Nguyen (2015) is that it can effectively teach students material, cost efficiency and provide a modern education. One of the determinants of student learning success is the learning media used by a teacher. the use of instructional media in the learning process can generate new enthusiasm, generate motivation and stimulation of learning activities, and even bring psychological effects on students so that the collaborative character can be well explored (J. Handhika, 2012). The 21st century is a century of knowledge marked by the rapid development of technology, information, and communication. The development of ICT has the potential to change the way a person learns and obtains information and provides opportunities for teachers to develop instructional techniques to get maximum results (Roza et al., 2017).

ICT learning media has become a necessity in the learning process. Media is everything that can be used to channel messages, stimulate thoughts, feelings, attention and willingness of students so that students can be encouraged and involved in the learning process (Angkowo and Kosasih, 2007). The use of instructional media can overcome common obstacles that often occur in the learning process, such as limited hours in class, boredom in the learning process, and the complexity of delivering abstract material (Syaiful Bahri Djamarah, 2008). Mills (2006) further states that integrating ICT into the classroom curriculum becomes an inseparable part of good teaching.

Chemistry media learning based on Autoplay media studio 8.0, has an advantage compared to conventional media such as power point. By using the media of learning chemistry based on Autoplay media studio 8.0, the teacher can develop media that is in accordance with the character of students by providing instructional texts that can encourage students to carry out collaborative activities. Besides animation, simulations can also be made through programs. Power points can also display animations and simulations, but can only be displayed using hyperlinks. Navigation buttons made through the Autoplay media studio 8.0 program are also more interesting. Autoplay media studio 8.0 can integrate all types of learning media in it, so students who use Autoplay media studio 8.0 have better learning achievements compared to conventional media such as power points.

The increase in student character that occurred in the learning process was due to the presence of visual media in the form of Autoplay Media Studio 8.0 which attracted the students' attention so that it stimulated the students to discover more information about the teaching materials. This could make the students to be active in the learning process. As stated by Bakrowi's (2007), one of the advantages of utilizing the ICT-based learning media is as a learning medium, one of which is the class presentation stage that usually makes the students who are passive to become active. Learning is interesting for students because the material explanation from the teacher is presented in the form of impressive pictures and animations. This is also emphasized by Harun and Zaidatun (2010) who state that one of the advantages of ICT media is that animation when used in education can offer a more enjoyable learning. Animations are able to attract the attention, increase motivation and activity, and stimulate more memorable student thinking.

The autoplay media was also effective since the Autoplay media studio 8.0 based chemistry media learning in acid-base material loaded several instructions that directed the students to carry out collaborative activities as shown in the figure 2.



Figure 2. Example of media display

The students who usually only wait the teacher's direction, now guided through the instructions in the media. This was in line to the statement of Bakrowi (2007) that one of the excellences of Autoplay Media Studio based learning media is that it can make the students' concentration can be fully focused on the learning presented. This was an important result, because by concentrating the students on interesting learning materials would create quality student learning outcomes will be create quality students' learning outcomes.

The use of Autoplay Media Studio 8.0 software-based learning media could generate the learning motivation which further improved the student character and eased the students to understand the material as shown in Figure 3.



**Figure 3. Student discussion activities**

This would have an impact on improving the students' cognitive learning outcomes. This showed that the character possessed by the students had an important role in improving the students' learning outcomes. This was supported by various studies that showed a relationship between motivation, learning activities, and increased student cognitive learning outcomes. There is a relationship between activity, learning motivation, and learning outcomes (Nugraheni, 2009). There is a positive and significant influence between activities, learning motivation on student learning activities, learning motivation on student life characters, and the students' learning activities on the student life characters. The implication is that as an effort to improve the character of student life, it is necessary to increase the students' learning motivation and the students' learning outcomes (Kiswoyowati, 2011).

Team and individual learning outcomes largely depended on how the team members performed collectively, how they collaborated with one another, and how the team as a whole acted when given problems. Generally, the performance of collaborative teams depended on respect, preferred learning styles, personality, trust, communication, and togetherness, in which it was demonstrated by organizational learning, communication tools, information sharing methods and tools, etc.), team abilities (demonstrated by self-study ability, subject skills/knowledge, team ability, etc.), teaching/learning methods, and others (Astin, 1997; Thompson et al., 2009; Qiu, 2010).

Various collaborative behaviors, such as time to communicate, frequency of interaction in teams, and how team members communicate, the frequency of individual class discussion participation, etc., greatly influence student collaborative (Selim, 2007). Although it has been well proven in empirical studies that group structure or components and characteristics of information flow have a major impact on the effectiveness of team interaction and collaboration (Imel, 1991; Smith and Smarkusky, 2005; Marks et al., 2005; Thompson et al., 2009; Qiu, 2010, Ku et al., 2013),, a relatively quantitative understanding of the dynamics of the learning service system is of great potential.

## CONCLUSION

Autoplay media studio 8.0 based chemistry media learning in acid-base material is effective to improve the students' collaborative character at SMAN 6 Pekanbaru with a significant enhancement, in which the averages are 71% of collaborative character. Moreover, the result of independent sample t test is  $0,00 < 0,005$ .

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