THE PROFILE OF STUDENTS' SELF-EFFICACY ON HYDROCARBON HYBRID LEARNING AND ANDROID- BASED- GAME

Nur Fitriyana
Graduate School
Yogyakarta State University
Yogyakarta - INDONESIA

Dr. Antuni Wiyarsi
Faculty of Mathematics and Natural Sciences
Yogyakarta State University
Yoogyakarta - INDONESIA

Prof. Dr. K. H. Sugiyarto
Faculty of Mathematics and Natural Sciences
Yogyakarta State University
Yoogyakarta - INDONESIA

Abstract

The profile of students' self-efficacy on hydrocarbon hybrid learning mediated by video conference and android-based-game has been analyzed. This research is a quantitative descriptive study. A total of 143 grade 11th students were cluster randomly selected from two public senior high school in Purworejo regency, Central Java, Indonesia. The samples were set into three different classes, namely Class CG-1 using android-based-game only, Class CG-2 using hybrid of video conference only, and Class E using both android-based-game and hybrid of video conference. The data of students' self-efficacy was obtained through questionnaire. The analysis of the profile students' self-efficacy was conducted by categorizing the score obtained from the questionnaire into ideal rating category. The results of this study showed that the profile of students' self-efficacy in the E class was highest.

Keywords: Android-based-game, hybrid learning, video conference, students' self-efficacy

INTRODUCTION

Bandura (1994) defines self-efficacy as a person's belief about his/her ability to organize and execute an action in order to achieve the desired goal. Self-efficacy focuses on self-consideration is a knowledge of his or her ability to successfully complete a task regardless of the ability of others (Woolfolk, 2007). Based on cognitive social theory, self-efficacy will affect the choice of activities, effort and persistence, beliefs (Schunk, Pintrich, & Meece, 2010), and performance (Ormrod, 2003; Villafane, Xu, & Raker, 2016). Furthermore, students who have higher self-efficacy, have more influence on education because students have high motivation (Mataka & Kowalske, 2015).

In terms of activity choices, students who have high self-efficacy tend to choose difficult and challenging tasks rather than students' who have low self-efficacy (Eggen & Kauchak, 2010; Kurbanoglu & Akin, 2010; Ormrod, 2003; Bandura, 1994; Zimmerman, 2000; Uzuntiryaki, 2008; Santrock, 2011; Schunk *et al.,* 2010). The students' belief about their self-efficacy manage the academic task can also affect students emotionally by reducing the students' stress, anxiety, and depression (Zimmerman, 2000). High self- efficacy in the students that fosters intrinsic motivation and deep involvement in activities that students do.

In the aspect of effort and persistence, students with high self-efficacy are more likely to try harder to complete the task. Students also tend to survive by continuing to try when faced with challenging tasks. Conversely, students with low self-efficacy will soon give up when faced the challenging tasks

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(Ormrod, 2003; Eggen & Kauchak, 2010; Bandura, 1994; Schunk *et al*, 2010). Students with high self-efficacy will survive to accomplish challenging tasks by taking longer to complete the task (Santrock, 2011). Students with high self-efficacy can improve and sustain their efforts in the face of failure, quickly restore their own efficacy after a failure, assume the failure occurs because the effort is not sufficient or lack of knowledge and skills acquired, have a good performance, and reduce stress (Bandura, 1994).

In terms of performance achieved, students with high self-efficacy tend to learn and perform better than students who have low self-efficacy even though the students have the same ability. Among students with the same ability, students who believe can do the task will be more successful than students who feel themselves unable to do the task. In short, there is a difference in academic performance between students with high self-efficacy compared with low self-efficacy although the ability of students is the same (Ormrod, 2003; Eggen & Kauchak, 2010; Uzuntiryaki, 2008). Therefore, the self-efficacy of students is very important to be analyzed in order to improve the performance of students in the learning process, especially in the chemistry teaching learning process.

Many students regard chemistry as a difficult subject. The abstract chemical concepts and lack of teacher support have become a cause of learning difficulties in the chemistry (Woldeamanuel, Atagana, & Engida, 2014). In example in the hydrocarbons teaching learning. The combination of letters and numbers in chemical equations or formulas causes the students to consider hydrocarbons as abstract and difficult to understand so that appropriate learning media are needed to facilitate students to understanding the material of hydrocarbon learning.

One of the learning media that can be utilized in the hydrocarbons teaching learning in accordance with the digital era is an android-based-game. Educational games can influence the behavior of students such as can provide a sense of fun in learning, a positive learning experience, and a positive impact on student learning outcomes (Jabbour, 2014). Jeng, Wu, Huang, Tan, and Yang, (2010) stated that many of the android-based-games are available and have many advantages such as can be utilized as innovative learning media that can be adjusted to the desired learning strategy. Games can provide many opportunities for students to learn more interesting. The android-based-game in this study contains a summary of learning materials and equipped with exercise questions that are packed in game form. This game media can facilitate students to learn so that the existence of interactive learning media is expected to improve the self-efficacy of students.

Another example of the use of Information and Communication Technology (ICT) in the teaching learning process is by hybrid learning. Hybrid learning is a learning that combines face-to-face and online phases (Zhao & Breslow, 2013), so that learning can take place wherever and whenever. Hybrid learning is found to be more effective and efficient (Partridge, Ponting, & McCay, 2011). The advantages of the use of hybrid learning are time efficient and one of the utilization of technological development. In hybrid learning, students and teachers increase the use of technology for teaching learning (Tayebinik & Puteh, 2012).

One of the media that can be utilized in the online phase of hybrid learning is video conferencing. The use of video conferencing in the teaching learning process allows students and teachers at different locations to see and talk each other. Among the distance learning technologies available, video conferencing is very similar to face-to-face learning in the classroom (Pandey & Pande, 2014). Hybrid learning method with video conferencing is highly dependent on self-motivation in the form of self-efficacy, self-regulated learning, self-discipline, and the ability to communicate effectively. The use of video conferencing in the online phase of hybrid learning is expected to foster the students' self-efficacy in the chemistry teaching and learning process.

This article aims to analyze the profile of students' self-efficacy on hydrocarbon hybrid learning mediated by video conferencing and android-based-game.

METHODS

Research Design

A descriptive research with a quantitative approach was set in this study. The samples in this study were set into three different classes according to the experimental manipulations, namely Class CG-1 using android-based-game only, Class CG-2 using hybrid of video conference only, and Class E using both android-based-game and hybrid of video conference. The research design can be seen in Table 1.

Table 1: Research Design

Class	Experimental Manipulations	Posttest
Compared-Group 1 (CG-1)	X_1	Y_1
Compared-Group 2 (CG-2)	X_2	Y_1
Experimental Group (E)	X_3	Y_1

Note: X_1 = hydrocarbon teaching learning mediated by android-based-game, X_2 = hydrocarbon hybrid learning mediated by video conference, X_3 = hydrocarbon hybrid learning mediated by video conference and android-based-game, Y_1 = self-efficacy questionnaire.

Participants

The participants in this study came from two public senior high school in Purworejo regency, Central Java, Indonesia. Both schools were chosen because has very good school accreditation and has adequate facilities for implementation of hybrid learning such as the internet network, computer, and smartphone. A total of 143 students with 16 years old average were the participants in this study. By cluster random sampling, those 143 participants then classified into three different classes which were a CG-1 of 50 students, CG-2 of 45 students, and an E group of 48 students.

Data Collection

According to the objective of this research, the data that would be implemented were obtained from the self-efficacy questionnaire. The initial self-efficacy questionnaire consisted of 30 points of statements using 4 scales (from never to always) which was modification of the Likert scales. The self-efficacy questionnaire was developed by determined the characteristics of students who have high and low self-efficacy following Eggen and Kauchack (2010); Santrock (2011); Zimmerman (2000); Bandura (1994); and Uzuntiryaki (2008). Characteristics of students of high self-efficacy used as a reference to a positive statement whereas those of low self-efficacy to the negative one. The data of students' self-efficacy was collected through a single measurement that is after the treatment in each class.

The self-efficacy questionnaire analysis was done by validity and reliability tests. Those self-efficacy questionnaire was validated theoretically and empirically. The theoretical validity was done by asking the expert judgment in terms of material, construction, and language to an expert from the Psychology Department. The theoretical validity analysis was performed using Aikens' V analysis for each questionnaire item. The Aiken's V statistics are formulated as follows (Aiken, 1985).

$$V = \frac{\sum s}{[n(c-1)]}$$

Note: s = r – lo; r = number of raters; lo = minimum validity score; c = maximum validity score; r = number given by raters.

The criteria used in the theoretical validity analysis format for the self-efficacy questionnaire in this study has a score 1 if not necessary, score 2 if useful but not essential, and score 3 if essential (Lawshe, 1975).

The calculation result of the Aiken's V value which obtained on each item of the questionnaire statement then compared with the value of the validity coefficient based on the interpretation

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guideline of uncorrected correlation coefficients in the predictive validity study according to Emery cited by Azwar (2016) presented in Table 2.

Table 2: The Interpretation Guideline of Uncorrected Correlation Coefficients On Predictive Validity Study

Validity Coefficient	Interpretation
> 0,35	Very useful
0,21 − 0,35	Useful
0,11 - 0,20	Depend on condition
< 0,11	Not useful

In this study, the item of self-efficacy questionnaire used very useful interpretation which has a value of Aiken's V greater than the value of the validity coefficient of 0,35. The analysis result showed that from 30 items of self-efficacy questionnaire statements, there were 26 items of self-efficacy questionnaire statements that have a very useful interpretation. So that, it can be said 26 items of self-efficacy questionnaire were theoretically valid.

Furthermore, empirical validity was done by testing the self-efficacy questionnaire against the other students that not used as the samples of this study. Those students used to test self-efficacy questionnaire empirically has certain criteria. The criteria in this case include having an average age of 16 years old and have studied hydrocarbons subject matter. A total of 342 students were obtained to test the self-efficacy questionnaire that has been developed. Based on the result of empirical validity analysis there were 3 items of questionnaire statements doesn't fit with Partial Credit Model (PCM). It means as much as 23 items of self-efficacy questionnaire statements fit with the PCM model. A total of 23 points of this questionnaire was used as an instrument to measure the students' self-efficacy. In addition, the analysis results show an Alpha Cronbach's reliability estimate of 0,72.

Data Analysis

The data which obtained from the self-efficacy questionnaire were analyzed by quantitative descriptive method. These students' self-efficacy score then converted into interval data scale. Furthermore, the data was classified into a category based on the ideal rating category. The rating category referred by Widoyoko (2009, p. 238) can be seen in Table 3.

Table 3: Ideal Rating Category

No	Score Range	Quality
1	$\overline{Xi} + 1{,}80\ SBi < X$	Excellent
2	$\overline{Xi} + 0{,}60\ Sbi < X \leq \overline{Xi} + 1{,}80\ SBi$	Good
3	$\overline{Xi} − 0{,}60\ SBi < X \leq \overline{Xi} + 0{,}60\ SBi$	Fair
4	$\overline{Xi} − 1{,}80\ SBi < X \leq \overline{Xi} − 0{,}60\ SBi$	Poor
5	$X \leq \overline{Xi} − 1{,}80\ SBi$	Very Poor

Note: SBi = x (ideal max score – ideal min score); $\overline{Xi}$ = x (ideal max score + ideal min score); X = average score of students' self-efficacy.

FINDINGS

The students' self-efficacy data in this study was obtained from the self-efficacy questionnaire and measured after the experimental manipulations were performed in each class. The profile of students' self-efficacy in this study was based on the ideal rating category according to Table 3. The profile of students' self-efficacy was analyzed and reviewed based on the mean of students' self-efficacy score in each class, the percentage of students' self-efficacy category in each class, and based on the

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percentage of self-efficacy category in terms of 4 aspects of self-efficacy. Table 4 shows the statistical descriptive of the students' self-efficacy data which obtained in this study.

Table 4: Descriptive Statistics of Students' Self-Efficacy

Class	Mean	Standard Deviation	N
CG-1	60, 8400	9, 47900	50
CG-2	64, 4667	7, 94183	45
E	67, 9317	9, 74435	48

Based on Table 4, it can be seen that the mean of students' self-efficacy in E class was highest and was classified as having a good self-efficacy category. In contrast, the CG-1 class has the lowest students' self-efficacy and was classified as having fair self-efficacy category. The profile of students' self-efficacy based on the mean which obtained in each class in this study can be seen in Figure 1.
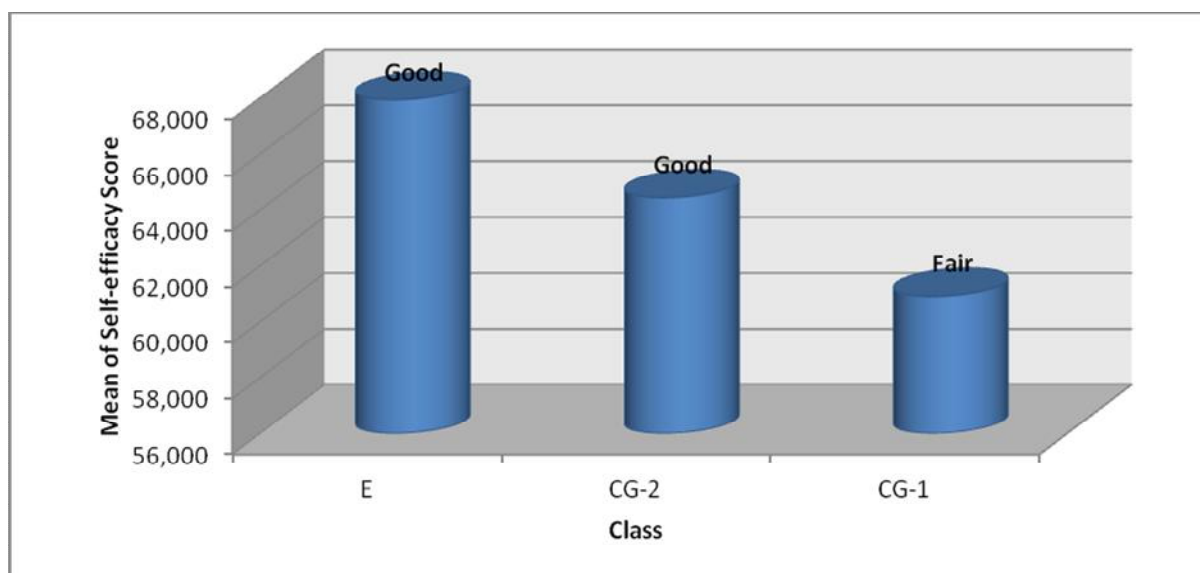

Figure 1: The Profile of Students' Self-Efficacy Based on the Mean of Students' Self-Efficacy Score in Each Class

The profile of students' self-efficacy then reviewed based on the percentage of students' self-efficacy category in each class. The profile based on the percentage of students' self-efficacy categories were obtained by counting the number of students who have self-efficacy categories excellent, good, fair, poor, and very poor in each class. The data from a number of three classes then made a percentage of ideality and compared. The students' self-efficacy profile can be seen in Figure 2.
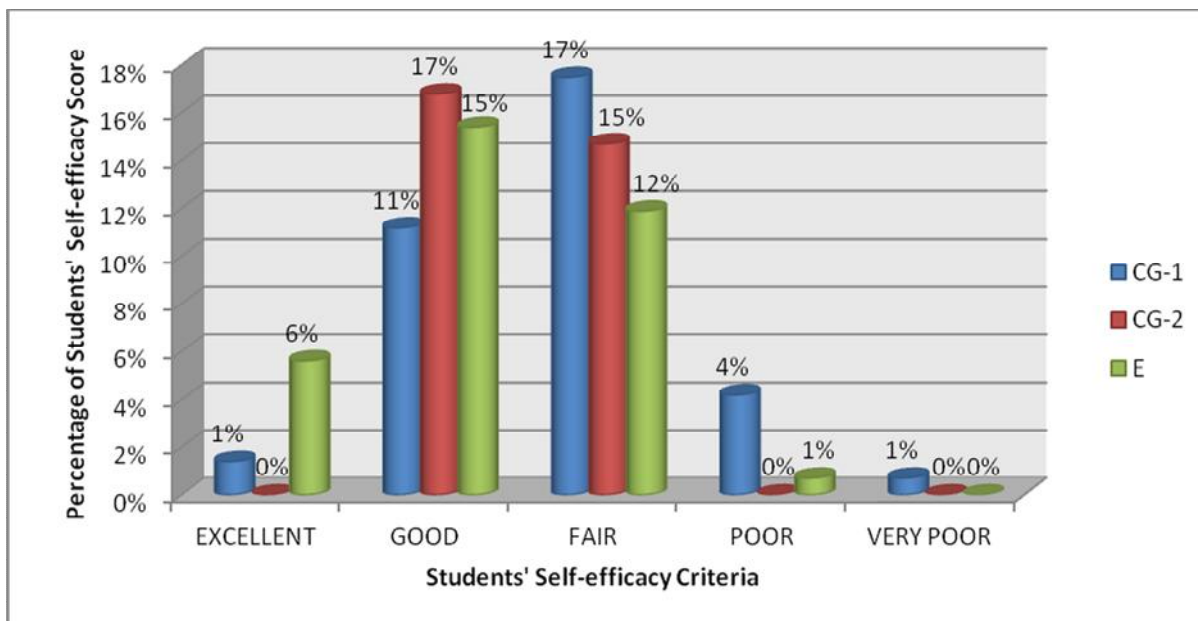
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Figure 2: Students' Self-Efficacy Profile Based on Percentage of Students' Self-Efficacy Criteria in Each Class

Based on Figure 2, it can be concluded that in the CG-1 the most dominant students have fair self-efficacy criteria (17%). In the CG-2 class a total of 17% of students have good self-efficacy criteria. As for class E that is a number of 15% of students have self-efficacy good criteria and 6% have very good criteria. In short, self-efficacy in class E is better than the other two classes.

The last profile of students' self-efficacy in this study was reviewed based on a number of 4 aspects of self-efficacy. A number of 4 of those self-efficacy aspects were based on the task orientation, effort and persistence, beliefs, and performance. The students' self-efficacy profile based on the aspect of task orientation can be seen in Figure 3.
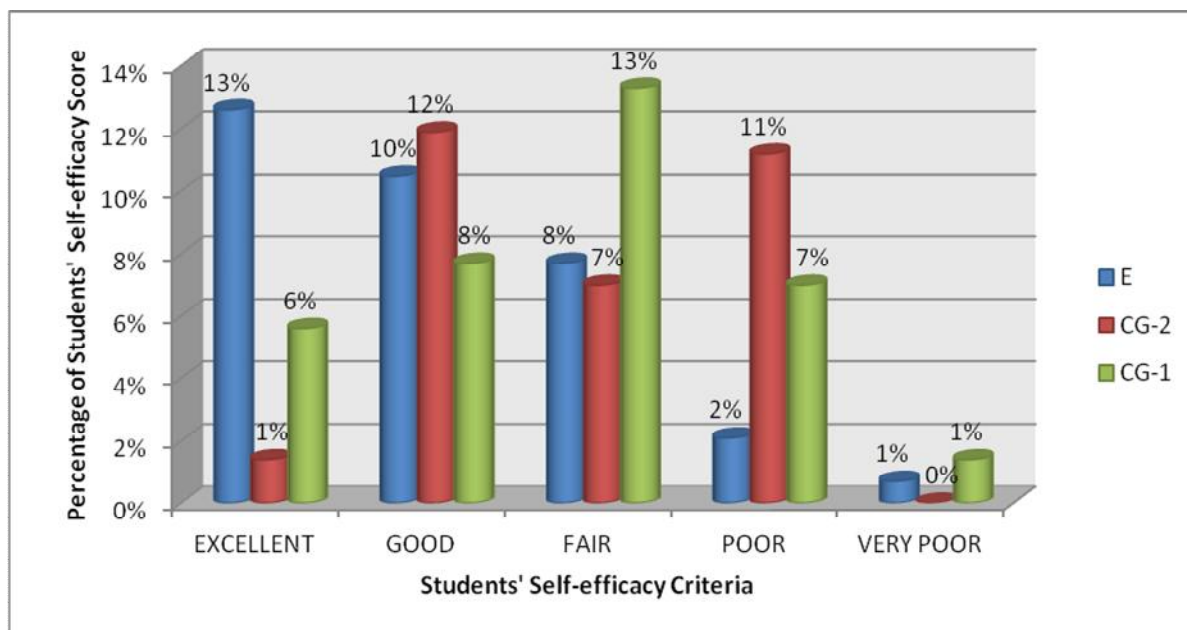

Figure 3: The Profile of Students' Self-Efficacy Based on Task Orientation Aspect

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Based on Figure 3, from the task orientation aspect, students in the class E most dominant have excellent task orientation. As for the CG-2 class, the students most dominant have good category self-efficacy and in the CG-1 class most dominant have fair category self-efficacy. Furthermore, the profile of students' self-efficacy based on effort and persistence aspect can be seen in Figure 4.
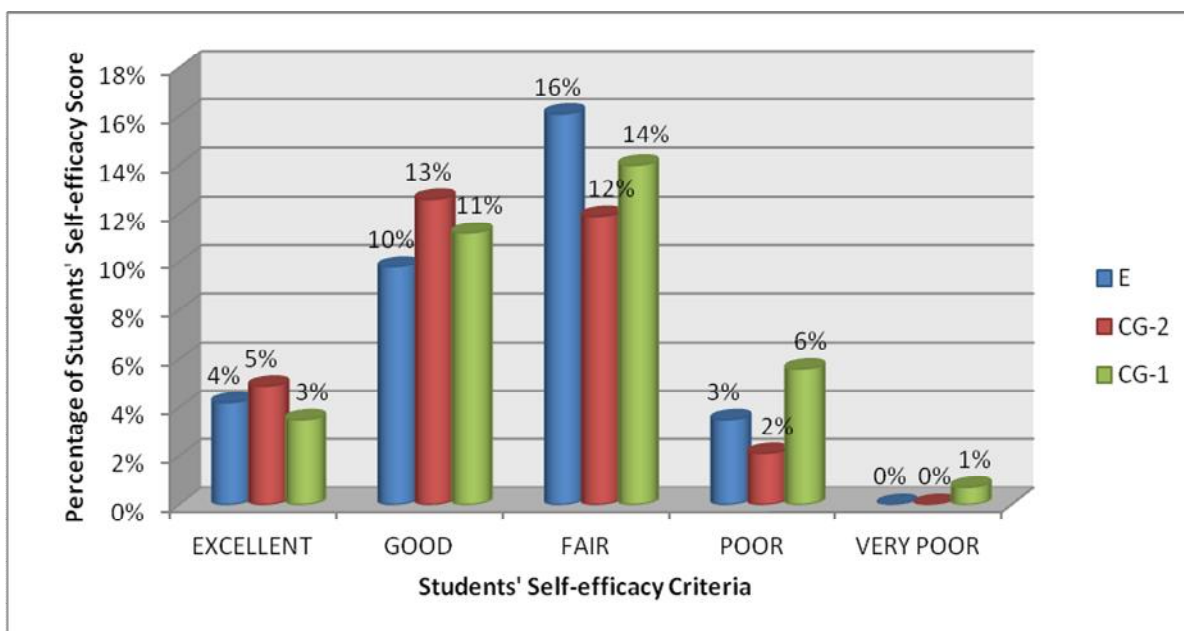

Figure 4: The Profile of Students' Self-Efficacy Based on Effort and Persistence Aspect

Based on Figure 4, in terms of effort and persistence, students in E and CG-1 class have a dominant effort and persistence on fair criteria. As for the CG-2 class, the students more dominant on good criteria of self-efficacy. The next, the self-efficacy profile based on beliefs aspect can be seen in Figure 5.
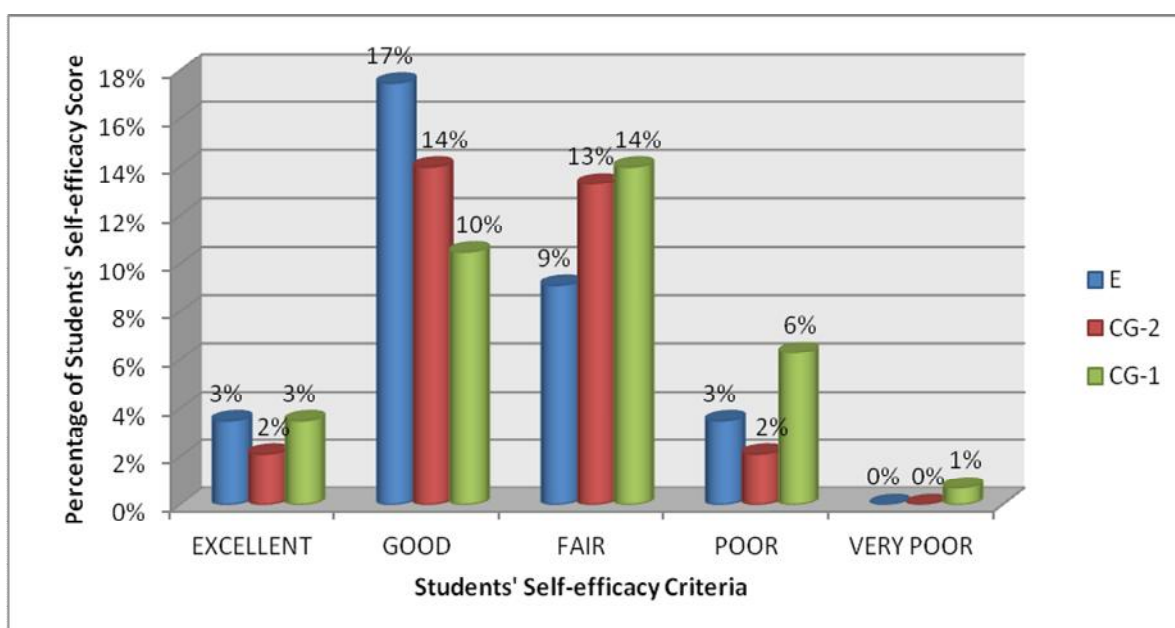

Figure 5: The Profile of Students' Self-Efficacy Based on Beliefs Aspect

Figure 5 shows the students' self-efficacy profile in terms of the beliefs aspect. Students in E and CG-2 class have a good dominant criteria of self-efficacy. But, in the CG-1 class, the students more dominant have a category fair of self-efficacy. The last, the profile of students' self-efficacy in the performance aspect can be seen in Figure 6.
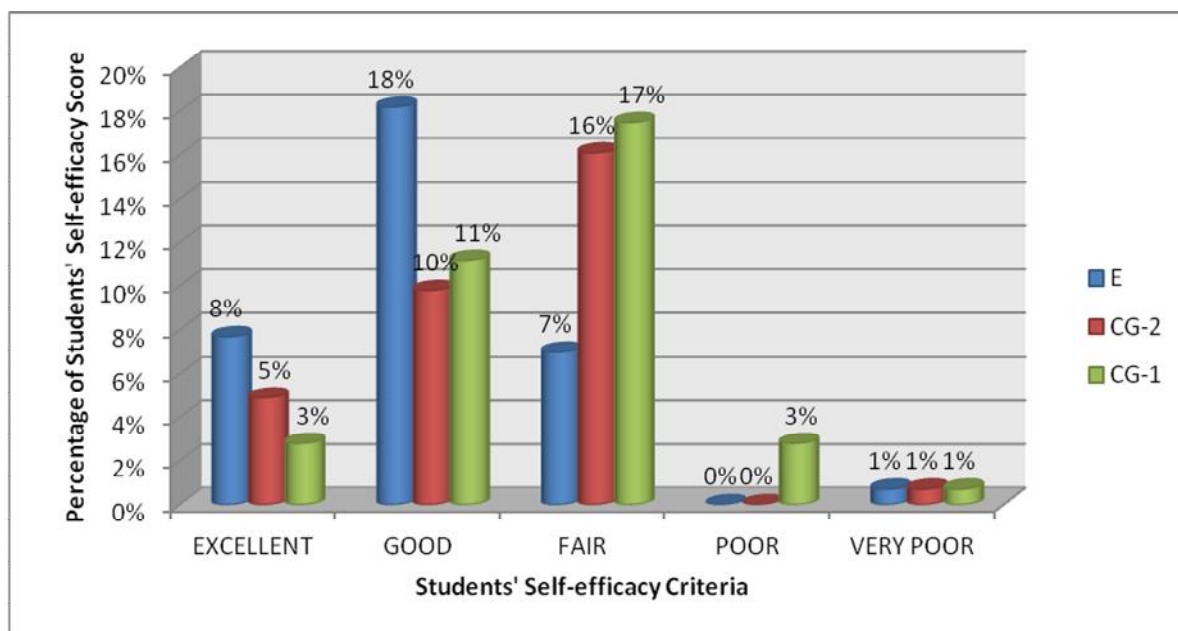

Figure 6: The Profile of Students' Self-Efficacy Based on Performance Aspect

Figure 6 shows the students' self-efficacy profile on the performance aspect. Based on performance aspect, the students in E class more dominant have a good self-efficacy category. While in the CG-1 and CG-2 classes were dominant have fair category self-efficacy.

DISCUSSION AND CONCLUSION

The utilization of ICT in the teaching learning gives positive impact on the students' self-efficacy. The profile of students' self-efficacy in this study was analyzed after ICT based learning was applied. The analysis of the profile of students' self-efficacy was reviewed based on the mean of the students' self-efficacy score in each class, the percentage of students' self-efficacy criteria in each class, and the percentage of students' self-efficacy criteria in terms of task orientation, effort and persistence, beliefs, and performance aspect.

The Profile Based on Average of Students' Self-Efficacy Score and Percentage of Students' Self-Efficacy Criteria in Each Class
Based on the mean of the students' self-efficacy score in each class, the results of this study showed that the students' self-efficacy in E class was highest compared to other two classes. The same results are shown when the self-efficacy profile was analyzed based on the percentage of the students' self-efficacy criteria in each class. Class E has the dominant self-efficacy criterion with good category while the CG-1 class is only dominant in the fair category. The differences of students' self-efficacy in this study was caused by the different of experimental manipulations in each class. High self-efficacy in class E was caused by the use of hybrid learning mediated by video conference and android-based-game.

Hybrid learning is a learning which combines two types of learning phases namely face-to-face and online phases to form a new kind of learning (Zhao & Breslow, 2013; Tayebinik & Puteh, 2012). The use of hybrid learning makes the learning process flexible and was one of the utilization of

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technological developments in the teaching learning process. Therefore, by using hybrid learning the students and teachers increase the use of technology for teaching learning process (Tayebinik & Puteh, 2012). Students can access the teaching learning materials wherever and whenever the students need it, therefore the students can easily understand the learning materials that hasn't been mastered.

E-learning in the online phase of hybrid learning can be either synchronous or asynchronous (Pandey & Pande, 2014). The synchronous learning occurs directly where the students can interact each other at the same time. While the asynchronous learning occurs rapidly enabling students to engage in the exchange of ideas or information without the dependence of the involvement of other students at the same time. Both asynchronous and synchronous methods depend heavily on self-motivation in the form of self-efficacy, self-regulation in learning, self-discipline, and the ability to communicate effectively.

The online phase of hybrid learning in this study uses video conferencing which is one example of synchronous e-learning. Video conferences are very similar to face-to-face lessons in the classroom. Hybrid learning methods with video conferencing depend on self-motivation, self-regulation, self-discipline, and the ability to communicate effectively (Pandey & Pande, 2014). This technology-based learning offers innovative methods to train students ' self-efficacy and can influence students' learning achievements through the interaction in online-phase of hybrid learning (Abulibdeh & Hassan, 2011). Through video conferencing, students can practice their self-efficacy. Students believe by involving the use of technology in learning will facilitate himself to understand the learning materials, so that the students' self-efficacy become good.

In addition to video conferencing, the online phase of hybrid learning in this research is assisted by the use of one of the asynchronous e-learning media that is a web based learning management system. Kim (2007) states that some of the advantages of using learning management system are improving learning effectiveness and academic achievement of students, increasing students' comfort in obtaining learning materials, and can increase learning time by using technology in learning. The results of Kaypak, Canbek, Bozna, and Tu (2017) showed that the use of asynchronous mobile learning in distance learning allows the students easily share their own learning experiences with others, providing assistance to each other to develop students' understanding on a particular learning topic, and can provide feedback among students directly. In short the use of mobile learning in distance learning can be used as a way to enhance cooperation, communication, and interaction among students in the learning process. The existence of this advantage makes students easily to solve problems in learning that he has not mastered. On the other hand, one study conducted by Chen (2014) show that a person with high self-efficacy is cooperative, helpful and willing to share in social situations. It means the web-based learning management system can improve the students' self-efficacy.

Furthermore, the use of an online asynchronous learning medium with mobile learning uses two important types of technology: mobile technology and social networking technologies in the learning process (Kaypak, Canbek, Bozna, and Tu, 2017). The advantage of both these technologies on distance learning is that students are accustomed to using this technology in daily life so that students are familiar with the structure of learning media used. The students also can also access learning materials anywhere and anytime. This reason which makes the self-efficacy of students who implement hybrid learning in this study increasing.

On the other hand, the optimization of ICT can be done by integrating android-based-game in the teaching learning. Educational games can influence the students' behavior, such as giving pleasure in teaching learning, providing a positive learning experience, and positively influencing students' learning outcomes (Jabbour, 2014). Games can provide many opportunities for students to learn more interesting and can facilitate the student to learning. Android-based-game is one of the android-based learning games that can be utilized as an innovative learning chemistry that can affect the

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academic performance of students. The Android-based-games applied in this study contain core competencies and basic competencies of hydrocarbon material that students must master, a summary of hydrocarbon learning materials, and exercise on hydrocarbon matter packaged in game form. The use of android-based-game gives a positive influence in the learning process because it makes students motivated by the presence of games in hydrocarbon learning. In fact, the results of this study indicate that in the CG-1 class that only apply android-based games have the lowest self-efficacy students compared to the other two classes. This is because students do not feel confident of her/his ability if only use the game in the learning process. The game paradigm just for fun is still firmly attached in this case.

The Profile of Students' Self-Efficacy Based on Task Orientation Aspect
Compared to the students who have low self-efficacy, students who have high self-efficacy will choose to perform difficult and challenging tasks to be mastered (Eggen & Kauchak, 2010; Kurbanoglu & Akin, 2010; Ormrod, 2003; Bandura, 1994; Zimmerman, 2000; Uzuntiryaki, 2008; Santrock, 2011; Schunk *et al.,* 2010). In general, students' self-efficacy plays a positive role in their attitude towards and their processes and outcomes derived from ICT based learning. Therefore, before attempting to interpret the conceivable relations between self-efficacy and ICT based learning, it is meaningful to discuss the relevant findings concerning Computer Self-Efficacy (CSE). CSE defined as an individual's perception of efficacy in performing specific computer related tasks within the general computing domain. Thus, CSE can be considered a domain specific measure of self-efficacy that reflects a person's belief in his/her ability to perform specific tasks based ICT. The results of Tsai, Chuang, Liang, and Tsai (2011) CSE has been shown to influence an individual's choice to engage in a technology task and the effort expended to accomplish it. In addition, Chen (2014) discovered that those who are more confident about their computer skills are motivated more to learn, and having more experience would lead to higher self-efficacy.

Based on the results of this study, students in class E feel the task given by the teacher through the hybrid learning phase is very challenging. Students are challenged to master the technology used in hydrocarbon learning. Students can easily access the learning materials when needed. This is what makes the self-efficacy of students in class E sharper. Compared with E and CG-2 classes that apply hybrid learning, the students' self-efficacy in CG-1 class is only dominant in fair criterion. Students in the CG-1 class are only given traditional tasks so that students are less motivated in completing the task that makes students' self-efficacy in this class tend to be low.

The results of this study were similar to those of previous studies. One study conducted by Chen (2014) shows that the students who used technology in the teaching learning, ranked their self-efficacy quite moderately and they accepted those technology as a good teaching learning media. These results are quite promising, since self-efficacy is one of the important factors in effective learning. The sense of technological self-efficacy, including ICT, affects the students' decision to use ICT in the teaching learning and is not dependent on their beliefs on the value of using that technology. Abulibdeh and Hassan (2011) proposed that all communication and interactions become mediated by the interface with which students must interact each time they wish to perform some task in the ICT-mediated environment.

The Profile of Students' Self-Efficacy Based on Effort and Persistence Aspect
Self-efficacy level influences the amount of effort exerted and the persistence in performing certain actions, the emotional responses of the person attempting the behavior, and the actual action of the person. The students with high self-efficacy are more likely to strive to complete the task. The students also tend to survive by continuing to try when faced with challenging tasks. Conversely, the students with low self-efficacy will soon give up when faced with challenging tasks (Ormrod, 2003; Eggen & Kauchak, 2010; Bandura, 1994; Schunk *et al*, 2010). The students endure to accomplish challenging tasks by taking longer to complete the task (Santrock, 2011). In this study, students in E and CG-2 class spent considerable effort when assigned to model hydrocarbon isomers and presented the task via video conferencing. Based on observations, the students try hard to master the use of

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video conferencing. The students are motivated to complete the task given by the teacher and then present it through video conferencing. After the students completes the presentation task through video conferencing, the students feel satisfied in the learning process. Teaching learning by video conferencing gives new experiences to the students in hydrocarbon learning. This is what causes the students have the dominant self-efficacy in the good category.

The results of this study supported the previous study. A study conduct by Chen (2014) shows that perceived usefulness is said to be the degree in which an individual believes that using a particular technology would enhance their performance; whereas, perceived ease of use is the degree in which a person believes that using a particular technology would be free of effort. In addition, Abulibdeh and Hassan (2011) argued that the complex interaction deals with simulations and actual data that can promote student interest to persist in learning, and real time relates to interaction of students and lecturers online.

The Profile of Students' Self-Efficacy Based on Beliefs Aspect
Students with high self-efficacy can control themselves when the goal is not achieved, assume the failure occurs because the effort is not sufficient or lack of knowledge and skills that can be obtained, have confidence to succeed in teaching learning, and have a desire to continue to learn despite the external nor internal conditions does not support (Bandura, 1994; Eggen & Kauchak, 2010; Santrock, 2011; Zimmerman, 2000). Based on the results of this study, the students in E and CG-1 class who does not have facilities to apply hybrid learning still tryng to learn well. The students are trying to borrow school facilities or friends who have facilities that support hybrid learning. Students are able to carry out the learning well, despite the external conditions does not support. Although under limited conditions, students continue to strive to be able to carry out the learning activities very well. After the online phase of hybrid learning was done, the students feel be able to learn the teaching material delivered by the teacher.

In this case, the sense of technological self-efficacy, including computers, affects the students' decision to use computers and is not dependent on their beliefs on the value of using that technology. Research conducted by Uzuntiryaki (2008) shows the results that if students believe have the ability to complete certain tasks then the students have high self-efficacy. In addition, Pintrich and Schunk (2001) stated that if someone attributes the success of internal factors such as ability, then self-efficacy is improved, which might be reasonably useful for students with high self-efficacy.

The Profile of Students' Self-Efficacy Based on Performance Aspect
Teacher may increase students' self-efficacy beliefs in terms of performance through modelling. Successful students or scientists can be examples for students to accomplish tasks and develop efficacy beliefs (Uzuntiryaki, 2008). Social persuasion, within realistic limits, can lead to successful performance: individuals put extra effort into accomplishing tasks and their self-efficacy is enhanced. These students believed in their ability to use metacognitive strategies to accomplish a task, which may have shaped their self-efficacy beliefs. Abulibdeh and Hassan (2011) revealed that noting social interaction is among the skills needed to increase both performance and productivity of students.

Students with high self-efficacy tend to learn and achieve better than students who have low self-efficacy even though the students have the same ability. Among students with the same ability, students who believe they can do the task then he/she will be more successful than students who feel themselves unable to do the task. In short, there is a difference in academic performance between students with high self-efficacy compared with low self-efficacy although the ability of these students is similar (Ormrod, 2003; Eggen & Kauchak, 2010; Uzuntiryaki, 2008). Self-efficacy based on dominant performance aspects with good category in class E still relate to task orientation aspect. In the aspect of task orientation, students in class E believe that they can accomplish the task that teachers are given successfully than students in CG-1 class even though the ability of students in class E and CG-1 alike.

In this case, a person's self-efficacy and technological acceptance are also related to their online learning performances. Although the performance of two groups of students, those who were taught in the traditional classroom setting versus those who learned through a ICT based learning, showed no remarkable differences, the latter group reported higher computer self-efficacy and a greater sense of satisfaction with their learning process. The sense of control over the learning process influences a students' sense of self-efficacy in which people with a higher self-efficacy are more willing to tackle a difficult task rather than avoid it. Chen (2014) study result revealed that perceived usefulness is said to be the degree in which an individual believes that using a particular technology would enhance their performance.

Considering the role of self-efficacy beliefs in students' attitude towards their processes and outcomes, it is worth examining ways of increasing students' self-efficacy at all levels of education. Therefore, special attention should be given to the sources that shape self-efficacy beliefs. Further research on students' self-efficacy analysis about the application of technology in teaching learning still needed. The growing ICT can be utilized in technology-based learning process to create a new and interactive learning atmosphere. Application of technology as an interactive learning media needs to be developed and seen the impact on the students' self-efficacy. In addition to improving the students' self-efficacy, the use of technology in the learning process can improve teachers' self-efficacy. Therefore, the teachers' self-efficacy profile analysis in the learning process should also be further explored. One study conducted by Calik (2013) indicate that the use of technology can improve self-efficacy of teachers. ICT-based learning can improve the teachers' self-efficacy because it uses an asynchronous e-learning which make the teacher communicated with their peers, scholars and lecturer; and uploaded all related documents, such as animations, simulations, videos, cartoons. This reason make the teacher always tends to create a discussion board for topics/issues in the course. Such a unique learning environment, which differs from the other pre-service courses, may have engendered an increase in the chemistry teachers' self-efficacy. In addition, teachers' self-efficacy in this case needs to be assessed, because the teacher is someone who plays an important role in the learning process. Teachers with good self-efficacy will make the learning process well organized so that the self-efficacy of students increasing.

BIODATA AND CONTACT ADDRESSES OF AUTHORS

Fitriyana is a student of Chemistry Department, Graduate School, Yogyakarta State University, Indonesia. Her interest is a quantitative research in education including the implementation of various chemistry teaching method, teaching-learning media such as instructional technology in the chemistry classroom, and assessment in chemistry education.

Nur Fitriyana, S.Pd.
Graduate School, Yogyakarta State University
Yogyakarta – INDONESIA
E. Mmail: nur.fitriyana2016@student.uny.ac.id

Wiyarsi is a lecturer and researcher in Chemistry Department, Faculty of Mathematics and Natural Science, Yogyakarta State University, Indonesia. Her interest of researcher are students' and teachers' self-efficacy, context-based learning in chemistry, Pedagogical Content Knowledge (PCK) of pre-service chemistry teacher, development of chemistry teaching material integrated vocational context.

Dr. Antuni WiyarsI, M.Sc.
Faculty of Mathematics and Natural Science, Yogyakarta State University
Yoogyakarta – INDONESIA
E. Mail: antuni_w@uny.ac.id

Sugiyarto is a lecturer and researcher in Chemistry Department, Faculty of Mathematics and Natural Science, Yogyakarta State University, Indonesia. Her interest of researcher are educational media development in chemistry teaching learning and has been uploaded in the playstore in the tittle of chemondro, misconception observed in chemistry textbooks and the users, students, and teachers.

Prof. Dr. K.H. Sugiyarto, M.Sc. Ph.D.
Faculty of Mathematics and Natural Science, Yogyakarta State University
Yoogyakarta – INDONESIA
E. Mail: sugiyarto@uny.ac.id

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