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ENGLISH TEACHER PARTICIPANTS' ENGAGEMENT IN ONLINE LEARNING SESSION OF TEACHING PROFESSION CERTIFICATION PROGRAM

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Abstract
This research analyzed the engagement of English teachers who participated in the preparation of the Teaching Profession Certification Program in Sanata Dharma University. There were 70 English teachers from schools in Central Java who participated in the online learning session before they followed the workshop session. The results showed that the level of active participation of the participants in the online learning session was very low. Although the mean score of the frequency of access (x = 42.39) was above the expected frequency of access (24), the mean score of frequency of message (x = 9.32) was far below the expected frequency of message (72). There were no significant differences between male and female participants and both the frequency of access and the frequency of messages. The frequency of access indicated a weak correlation with the scores of final examination ($r = 0.21$, $p < .05$), but the correlation between the frequency of access and the final examination scores did not significantly exist ($r = 0.02$, $p > .05$). It is recommended that future attempts to investigate online activities in professional development programs for English teachers should encourage instructors and participants to be more engaged in their online learning activities.

Keywords: engagement, frequency of access, gender, online learning

Introduction
Participant engagement is an essential component of an online learning environment. The engagement of the participants in online learning is indicated by the interaction among the participants and the participant and the tutor. In any online learning environment, the contribution from the participants is crucial in which they are expected to actively discuss the content of a course with other participants and the instructor. Learners' engagement has become an important issue in designing and establishing online learning activities. Purnama (2017, p. 1) mentions that "By highlighting youths' characteristics that tend to be visual and addicted to rapid information, memes and Instagram may be used as one of the strategies to develop an innovative teaching and learning process." It is in line with Wulandari (2017) who suggests that flipped classroom in digital environment

gives positive learning atmosphere. Although the meaning of engagement may be the same both in online learning activities and in conventional classroom, it might be different in challenges (see Isworo, 2016, p. 12) and barriers. In general sense, engagement is "the time and energy students devote to educationally sound activities inside and out-side of the classroom" Kuh (2003, p. 25). An online learning environment also requires participants to devote "the time and energy" in "educationally sound activities" so that the objective of the curriculum can be attained.

This research is an exploration of participants' engagement in online learning program in preparation of in-service teacher certification program designed by the Ministry of Education and Culture (MEC) in Indonesia conducted in 2017 (see Harendita, 2017, p. 61). This research is limited on the analysis of English teacher participants who were assigned to join the program in Sanata Dharma University. There were seventy English teachers who were enrolled in Sanata Dharma University in 2017. Since 2007 Sanata Dharma University has participated in the teachers' professional certification program. Based on the Indonesian regulation of national education teachers who teach in schools must have a teaching profession certificate. The Indonesian Ministry of Education and Culture (MEC) is initially the only organization that has the privilege to design, manage, and carry out the teaching certification program for in-service teachers. The program is a nation-wide one in which the MEC assigned some universities to carry out curriculum activities of the program.

Starting in 2017, in-service teachers who are invited in the certification program must follow a pre-condition activity (matriculation) in the form of online learning activity. The Ministry of Education and Culture provides modules that teachers have to independently learn the certification program materials. The online-learning activities lasted in three months. One group consisted of ten to thirteen participants and guided by an instructor (mentor) assigned by the hosting university. There were four required assignments that the participants had to submit. The instructor arranged the time of submission. The participants had to access the learning portal designed by the technology team of the Ministry of Education and Culture. The online learning portal consists of interfaces that the participants were able to communicate in an online chat with other participants and the instructor and submit the required assignments. Therefore, there was enough medium for the participants to conduct the interaction for discussing the materials.

The participants had enough time to engage in online learning activities. The have enough opportunities to actively engage by thinking, talking, and interacting with the content of a course, the other students in the course, and the instructor. Their activities became the key element in keeping the participants connected with the course and, thus, with their learning (Dennen, Darabi, & Smith, 2007; Kehrwald, 2008; Robinson & Hullinger, 2008; Shea, Li, & Pickett, 2006; Swan, Shea, Fredericksen, Pickett, Pelz, & Maher, 2000). This form of engagement is the most essential in this activity. Some instructors also reported that they opened the opportunities for the participants to communicate with other medium such as email, cellphone messages, and WhatsApp. Therefore, it was assumed that after

the online learning preparation, the participants have enough material mastery before they follow the certification program.

This study is an exploration of the participants' engagement in the online learning preparation program as part of the in-service teachers' certification training and education. It is a descriptive study to examine the participants' engagement in online learning environment. The guiding research questions for this study were

1. To what extent do the participants engage in online learning activity?
2. Is there any difference in participation between male and female participants?
3. Is there any positive correlation between the participation in online learning activities and the final learning assessment scores?

This research is limited of describing the participants' engagement on the online learning activities. The correlational study is limited on describing the degree of association of the frequency of access and messages and the result of final learning assessment. Further study is needed to explore the real impact of the online learning activities on the final result of learning.

It has been pointed out that participants' engagement is essential for the success of online learning environment. Some works have discussed the importance of engagement in learning for a long time. For example, Engagement is defined in terms of interest (Dewey, 1913), effort (Meece & Blumenfeld, 1988), motivation (Pintrich & DeGroot, 1990) and time on task (Berliner, 1990). Natriello (1984) defined student engagement as "participating in the activities offered as part of the school program" (p. 14). Skinner and Belmont (1993) mention that learners who are engaged show sustained behavioural involvement in learning activities accompanied by a positive emotional tone. In more recent definition, engagement is used to refer to students' willingness to participate in routine school activities, such as attending classes, submitting required work, and following teachers' directions in class.

Engagement is, as a matter of fact, the core nature in constructivist learning approaches. The constructivist learning paradigm is characterized by the provision of opportunities for students to determine, challenge, change or add to existing beliefs and understandings through engagements in tasks that are structured (Richardson, 2003). In the root of constructivist learning pedagogy, learners' engagement in real-world or practical workshops becomes the important requirement for the success in learning. In this context the learners would have opportunities to demonstrate their knowledge through creativity and collaboration (Dewey, 1933). Research reports have indicated how learners' engagement is considerably important in constructivist learning environment (Li & Guo, 2015; Dev, 2016; Vaughan, 2014; Maheshwari & Thomas, 2017; Kahn et. al., 2016). In the basic sense, the success of learning, especially in online learning environment, relies on learners' commitment in carrying out the learning tasks.

Learner engagement is critically crucial in successful learning. When learners are engaged in intellectual activities, they will devote their time to explore, discuss, collaborate, and open their minds so that they will improve their knowledge. Considering the importance of learners' engagement becomes the highest need to prevent student drop-out and improve students' learning. In a

study, Whannell and Allen (2011) reported that students who had not completed secondary school indicated significantly lower levels of emotional engagement with school and poorer relationships with teachers. Moreover, Gunuc (2014) reports that significant relationships exist between the students' academic achievement and student engagement. The study covers multiple domains of engagement: cognitive engagement, behavioural engagement and sense of belonging. Similar findings have been reported that learning engagement has important effect on students' success of learning (Kuh & Hu, 2001; Chen, Lambert, and Guidry, 2010; Duderstadt, Atkins, & Hoeweling, 2002; Thurmond & Wambach, 2004). Wara, Aloka, Odonge (2018) claim that cognitive engagement was a significant predictor of academic achievement among secondary school students. Learning engagement always becomes an important point in researchers' suggestion to find ways to improve learners' engagement in learning processes.

Many attempts and ideas have been proposed to increase learners' engagement in online learning environments. Theories on engagement has widely established as behavioural engagement, cognitive engagement, and emotional engagement (Harper, S. R., & Quaye, S. J., 2008; Blumenfeld, P. C., Kempler, T. M., & Krajcik, J. S., 2006; O'Donnell, A. Reeve, J. M. & Smith, J., 2011). Therefore, many kinds of strategies can be implemented to increase learners' engagement. The basic nature of increasing learners' engagement includes thinking, sharing, talking, and interacting with the content of a course, the other students in the course, and the instructor so that the activity will maintain students' interaction with the course and, thus, with their learning (Dennen, Darabi, & Smith, 2007; Kehrwald, 2008; Robinson & Hullinger, 2008; Shea, Li, & Pickett, 2006; Swan, Shea, Fredericksen, Pickett, Pelz, & Maher, 2000). The implementation of these methods is not only applicable in an online learning environment but also manageable in conventional learning situations. More specific efforts to increase learners' engagement in online learning contexts include clear assignment, scheduled activities, participants' interaction (including instructor), and collaboration. Dixon (2010) suggests that instructors need to create meaningful and multiple ways of interacting with students and encouraging/requiring students to interact with each other.

There might be some natural factors like age, gender, and place of origin in the engagement on online learning activities. Some other such as experiences and education degree also may influence the participant engagement in the online learning activities. A study by Garlan and Martin (2005) indicates that gender was a factor in the relationship between learning style and student engagement in the learning style of the online course. Furthermore, Rogers (2008) mentions that female students benefited less from e-leaning material than their male counterparts. However, the development of era might change the gender differences in the engagement in online learning activities. The different attitudes between male and female change because the use of technology has become more and more popular both for males and females. Participants' age has also been suspected to be the crucial factor that might influence the effectiveness of online learning courses. A study by Thill, Rosenzweig, and Wallis (2016) indicates that

observable trends tied age and higher grade point average to higher levels of engagement with online instruction.

The issues of gender, however, are always controversial since gender is one of social and cultural constructs that may change overtime. Technology is inherently patriarchal in nature in which technology has become male domain (Young, 2000; Clewell, 2002; Eastman & Krendl, 1987; Pinkard, 2005). However, the use of technology by women for the purposes of learning, communication, and economy has increased significantly. Economides and Grousopoulou (2008) report that women use of technology increases significantly. Although the evidence may be different in one country to other countries, the use of cell phones by women becomes more and more popular (North, Johnston, & Ophoff, 2014). In addition, the evidence is very limited to claim that women are more intensive in using digital technology than men. However, the increase of social media technology makes women more confident in the use of technology in their daily activities. Mobile technology becomes more popular for women since it facilitate them to chat, to communicate with their families, and to learn independently online (North, Johnston, & Ophoff, 2014). The expansion of online shopping has attracted the basic nature of women to fulfill their needs. It will be much easier for women to browse new fashion, make-up utensils, house care utilities, etc. Finally, digital technology becomes closer and closer to women that may narrow the gaps between males and females on their use of technology.

Maintaining learners' engagement in online learning activities should also consider the challenges and barriers. The characteristics of online learning activities include the distance between learners and learners, learners and instruction. Therefore, physical presence of all participants will always become the challenges of the teaching and learning activities. Many discussions have been presented to address the issue that the lack of direct interaction between learners and instructors becomes an important factor of students' dissatisfaction with online learning programs. Kehrwald (2008) argues that learners need to be able to share more than "just the facts" and they need to feel they are not communicating with machines in cyberspace, but real people. In addition, Dixson (2015) elaborates the importance of social presence, teaching presence, and cognitive presence in online learning environment in which social presence becomes a key factor in student engagement. Another challenge relates with real learning assurance. Effective learning will happen when learners actively construct their own knowledge through independent study and participating in collaboration and interaction in meaningful discussion. To assure that the learners experience those learning efforts requires more challenging method in online learning compared with conventional learning programs. Posting to forums, writing e-mails, taking quizzes are some example to monitor learners' participation in online learning environment.

The most obvious barrier that is also important relates with the Internet connection. People who concern about the high expectation of online learning to increase academic outreach have addressed the importance of the virtual signal and bandwidth. In modern countries, this issue might not be so popular since the Internet connection has already been popular throughout the area including

villages in remote places. On the other hand, in developing countries like Indonesia, there are still many areas in which people have difficulties to access the Internet. People in remote areas must go to bigger cities to have good access to the Internet. In addition, although some e-learning portals or social media may only limited on textual communication, the Internet connection becomes the most crucial requirement for participation in online learning environment. For example, the best Internet speed for Facebook chat is the fastest that users can manage under the limited budget — aim for at least 3 Mpbs download and 1 Mpbs upload. However, this low need of bandwidth will never be attained without the presence of internet connection.

Based on the literature, the factor of age and gender of English teachers might influence the level of engagement in the online learning program in preparation of in-service teachers certification program conducted in Sanata Dharma University. In addition, studies have indicated the favorable connection between the learning activities and academic achievement. The engagement in the online learning program in preparation of in-service teacher certification program is also expected to have positive correlation on the learning achievement of the participants.

Method

To analyse the participants' engagement in the online learning preparation program as part of the in-service teachers' certification training and education, basically the researcher used descriptive statistics. Using this method, the researcher was able to get the complete description about the participants, the frequency of access, and the frequency of participation in the discussion forum. Furthermore, the researcher was also able to measure the correlation between the frequency of access and participation in discussion forum with the learning assessment conducted at the end of the program.

The data source

The data was taken from the database containing the record of the English teachers who were enrolled in the online learning preparation program as part of the in-service teachers' certification training and education in Sanata Dharma University. The database contains information about sufficient demographic data which includes names of instructors, participant gender, length of teaching, age, and final assessment scores.

Procedure

After the researcher obtained the data from the administrator of the online learning preparation program as part of the in-service teachers' certification training and education in Sanata Dharma University, the researcher organized the numerical data into a more manageable database. The researcher analysed the demography, initial test score, frequency of access, numbers of messages, and the final test score of the students. From this data, the researcher generated data tables and visuals to get detailed description of the data.

The researcher conducted a one-group sample T-test to get the significance of the comparison between the frequency of access and a hypothetical mean score. The researcher generated the hypothetical mean score from the expected frequency of access based on the available time for the online learning process,

namely 24. The researcher used the similar approach for comparing the frequency of messages and a hypothetical mean score of 72. Those hypothetical mean score were generated from the assumption that in three months the participants had the opportunities to access the learning portal twice a week. It was assumed that every time the accessed the portal they at least sent messages three times: greetings or asking questions, presenting ideas, and responding to friends' posted issues. Furthermore, the researcher conducted the comparative analysis using independent sample T-test to explore the different engagement between male and female participants. Afterwards, the researcher conducted correlational analysis to examine the association between the participants' engagement and the result of the final examination. To get more detailed result of analysis, the researcher analysed the correlation between the frequency of access and the result of final examination; and the number of messages and the result of the final examination separately.

Findings and Discussion

Data Presentation

No	Sex	Number of Participants	Percentage
1	Male	30	42.86%
2	Female	40	57.14%
TOTAL		70	100%

Table 1. Number of Participants

The table above indicates the general description of the online learning activities that have been investigated. There were 30 male and 40 female English teachers who participated in the online learning session prior to the workshop session as part of the in-service teachers' certification training and education in Sanata Dharma University. The mean score of the frequency of access in the table of the Frequency of access is 43. The frequency of access constitutes the least frequent of access of 2 times and the most frequent of access of 223 times. The mean score of access (43) is higher than the expected frequency of access (24). There were at least 24 (34%) participants whose frequency of access the online learning portals is below the expected number of access. Meanwhile, 46 participants accessed the learning portal above the expected frequency of access. This constitutes 66 percent of the total number of the participants.

The data reveals that when the participants accessed the learning portal did not mean that they participated in the discussion forum by posting messages, asking questions, or responding to other participants' message. It was suspected that many participants just logged in and browsed information in the discussion forum without interacting neither with other participants nor with the instructors. The data summary in the number of messages indicates that the total frequency of messages was 565. All participants have the frequency of messages that is below the expected number of 72. Therefore, the mean score of the frequency of message is very low ($\bar{x}$=9.39). This score constitutes the least frequent message of 0 (zero) and the most frequent message of 37. In brief, the data indicates the

participants' engagement in the online learning session prior to the workshop session as part of the in-service teachers' certification training and education in Sanata Dharma University is far below the expectation.

The frequency of access

No	Access	Frequency	Percentage	Cumulative	Tot_access
1	1 - 10	12	17%	17%	68
2	11 - 20	12	17%	34%	175
3	21 - 30	8	11%	46%	206
4	31 - 40	10	14%	60%	335
5	41 - 50	7	10%	70%	322
6	51 - 60	3	4%	74%	158
7	61 - 70	4	6%	80%	258
8	70 - 80	3	4%	84%	224
9	81 - 100	5	7%	91%	444
10	101 - 250	6	9%	100%	820
		70	100%		3010
Total of access = 3010		$\bar{x}$ = 43	$n = 70$	$SD = 39.94$	

Table 2. Frequency of Access

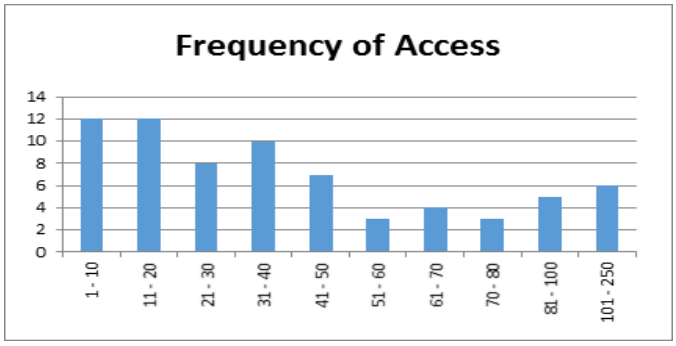

Table 3. Frequency of Access

The comparison below was intended to test whether the difference between the frequency of access and the expected frequency of access is significant. One sample T-test was used to analyze the difference using the hypothetical score of 24 as the expected frequency of access.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Access	70	43.00	39.944	4.774

One-Sample Test

	Test Value = 24 (access)			
	t	df	Sig. (2-tailed)	Mean Difference
Access	3.980	69	.000	19.000

The result of one sample T-test indicated that the real frequency of access is significantly higher than the expected frequency of access ($\bar{x}$=43, df=69, t=3.980, p<.05). Therefore, it is evident that the participants' activities in logging in and browsing the chat forum was above the expected frequency of access.

The frequency of messages

No	Messages	Frequency	Percentage	Cumulative	Tot_mess
1	1 - 5	29	41%	41%	92
2	6 - 10	19	27%	69%	152
3	11 - 15	9	13%	81%	112
4	16 - 20	5	7%	89%	84
5	21 - 40	8	11%	100%	217
		70	100%		565
Total of messages = 565			$\bar{x} = 9.39$	$n = 70$	$SD = 7.98$

Table 4. Number of Messages

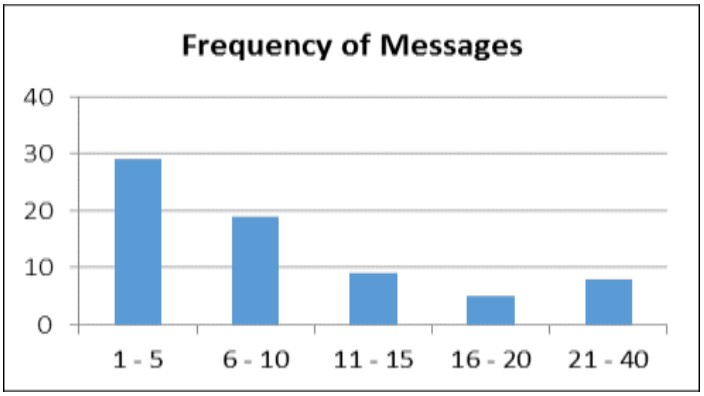

Table 5. Frequency of Messages

The comparison below was intended to test whether the difference between the frequency of messages and the expected frequency of messages is significant. The method used was similar to the previous method in which one sample T-test was utilized to analyze the difference using the hypothetical score of 72 as the expected frequency of messages.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Messages	70	9.39	7.977	.953

One-Sample Test

	Test Value = 72			
	t	df	Sig. (2-tailed)	Mean Difference
Messages	-65.673	69	.000	-62.614

In contrast with the previous analysis, the test result of one sample T-test indicated that the number of messages was significantly far below the expected number of messages ($\bar{x}$=9.39, df=69, t=-65.673, p<.05). Thus, it is evident that the participants' activities in interacting with other participants and the instructor were far below the expectation. It is suspected that the active participation was limited on logging in, browsing, asking technical questions, or reporting to the

instructor that they have submitted the assignment. There were only small numbers of participants who actively present ideas or discuss the learning materials with other participants and the instructors.

The differences between male and female on access and messages

The analysis below is the comparison of engagement between male and female English teachers in the online learning activities that have been investigated. The frequency of access and the frequency of messages were analyzed using independent sample T-test.

Group Statistics

	FM	N	Mean	Std. Deviation	Std. Error Mean
Access	Male	30	52.67	49.399	9.019
	Female	40	35.75	29.706	4.697
Messages	Male	30	8.83	6.721	1.227
	Female	40	9.80	8.864	1.402

Independent Samples Test

		t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Access	Equal variances assumed	1.781	68	.079	16.917	9.499
	Equal variances not assumed	1.664	44.433	.103	16.917	10.169
Messages	Equal variances assumed	-.499	68	.619	-.967	1.937
	Equal variances not assumed	-.519	67.984	.606	-.967	1.863

The result of independent sample T-test indicates that there was no significant difference between male participants and female participants in the frequency of access ($\bar{x}_m$=52.67, $\bar{x}_f$=35.75, df=68, t=1.781, p>.05). Similarly, there was no significant difference between male participants and female participants in the frequency of messages ($\bar{x}_m$=8.83, $\bar{x}_f$=9.80, df=68, t=-0.499, p>.05). The results of both T-test give sufficient evidence that male and female participants had equal behaviors in participating in the online learning session prior to the workshop session as part of the in-service teachers' certification training and education in Sanata Dharma University.

Correlation between participation and final assessment scores

The correlational analysis was done using Pearson Correlation to get the correlation coefficient. The analysis was intended to identify whether there is a positive correlation between the participation and the post test scores.

Correlation between Access and Post Test Scores

		Access	PostTest
Access	Pearson Correlation	1	.214*
	Sig. (1-tailed)		.038
	N	70	70
PostTest	Pearson Correlation	.214*	1
	Sig. (1-tailed)	.038	
	N	70	70

Correlation between Messages and Post Test Scores

		Messages	PostTest
Messages	Pearson Correlation	1	.023
	Sig. (1-tailed)		.424
	N	70	70
PostTest	Pearson Correlation	.023	1
	Sig. (1-tailed)	.424	
	N	70	70

The result of correlational tests indicates that the correlation of the frequency of access and the post test result was very low($r=0.21$, $df=68$, $p<.05$). However, the correlation is positive and significant in the sense that there is a chance to expect that the frequency of access may contribute to the result of learning. Nonetheless, the frequency of access only shares about 4.58% of coefficient of determination so that other unidentified variables have bigger contribution to the learning result. On the other hand, the result of correlational test between the frequency of messages and the posttest result indicates a very low positive correlation or no correlation at all ($r=0.023$, $df=68$, $p>.05$). It doesn't provide enough evidence that the frequency of messages sent by the participants associates with the result of the final examination or result of learning.

Based on the findings in this study, there are three major issues that provide a gateway for discussion. First, there is an urgent need to overcome the low engagement of online learning participants. Second, male and female online learning participants begin to be equally engaged. Third, challenges on sustaining participants' motivation are still persistent and require certain strategies to sustain the high motivation of the participating learners.

It has been pointed out previously that engagement has been an important factor for academic achievement and success of learning. Therefore, it is important that the online learning participants to engage actively in learning process. Learners' engagement in intellectual activities in the form of exploration, discussion, collaboration will improve their knowledge and success of learning (Whannell and Allen, 2011; Gunuc, 2014; Kuh & Hu, 2001; Chen, Lambert, and Guidry, 2010). It will be very difficult to expect successful learning when the learning engagement of online learning participants is low. Consequently, the online learning environment should be designed so that the participants are encouraged to carry out the intellectual activities which include thinking, sharing, talking, and interacting with the content of a course, the other students in the course, and the instructor.

There may be many factors that impact the participants' low learning engagement in online learning environment. The data in this study shows an interesting truth in which the participants' access on the online portal is more favorable that participants' commitment to participate in discussion forum through

sending messages. The most reasonable interpretation of this fact relates with motivation and interest (Dewey, 1913; Pintrich & DeGroot, 1990). The facts that the frequency of access is higher than the expected and the frequency message is far below the expected indicate that the participants have low motivation and interest in the learning process. Their motivation and interest are most possibly limited on fulfilling the basic requirements of the program. In conclusion, there must be some effort to design online learning programs that consider the explicit, clear and high requirements which facilitate participants to be more motivated in the online learning processes.

The data in this study indicates that the engagement of male and female online learning participants is considerably equal. The previous theories suggest that gender becomes an important factor of engagement and female participants may benefit less in from e-learning materials (Garlan and Martin, 2005; Rogers, 2008). However, the recent improvement of technology has made men and women have equal access to and control over technology. Recently, men and women tend to have the same level of digital access, fluency, and affordability. In addition, in some contexts women are better at using those digital skills to gain more education and to find work. Female professionals have realized that they can embrace and use digital technologies to become more knowledgeable, connected, and effective.

The data in this study indicates that there is a very low positive correlation between participants' access to the learning portals. Meanwhile, there is no significant correlation between the frequency of messages and the result of the final examination. This phenomenon is consistent with the challenge of retaining learners' motivation in online learning contexts. The frequency of access reflects the external motivation of the participants. They accessed the online portal because it was a program requirement. Meanwhile, the absence of association between the frequency of message and the final test results indicates that the participants have low intrinsic motivation which refers to behavior that is driven by internal rewards that they want to master the learning materials provided in the learning modules. This kind of motivation becomes the barriers in retaining learners in an intensive, qualified, and meaningful intellectual interaction using online learning system.

Conclusion

From this study, there are three significant conclusions that can be generated. First, the data and analysis of this study provides evidence that the engagement of English teacher participants in online learning program in preparation of in-service teachers' certification program in Sanata Dharma is low. Although the frequency of access was above the expected rate, the frequency of messages is considerably low. This indicates that retaining learners' engagement in online learning environment still becomes a crucial challenge in designing and conducting online learning activities for professional development programs for English teachers in Indonesia. Second, the gap between male and female participants on online learning environment is very narrow. This finding may improve the expectation that female participants in online teachers' professional

development will have better engagement in the future. Third, many research studies claim that engagement in online learning activities has positive impacts on learning achievement. However, the truth is that online learning program is a system that consists of many factors. Factors outside participants' engagement might have more significant effects on the learning achievement. In addition, factors other than engagement in isolation may impact of the motivation on learners to participate more intensively so that learners' engagement in online learning environment can be improved.

The future possibility of using online learning platforms for professional development is widely open. The use of technology provides more choices for everyone to access knowledge, skills, and better career. Therefore, it is suggested that the online learning designers consider the importance of participants' learning engagement in designing the infrastructure of the online learning system. They need to design the online learning portal interfaces that are user friendly and easy to access. It is not only for the sake of the participants but also for the instructor. It is also important for professional development program managers to carry out a particular monitoring system which help online learning instructors to facilitate the learners for making intensive communication. The interaction between the participants and the learners is so crucial that the participants feel that they are working together with human beings, not machines. In addition, gender identity will always become an important issue in developing and establishing online learning systems for adult learners. Without neglecting the change of the phenomena that women become more familiar with technology, the domination of men is still significant when digital technology is used. On the other hand, the contribution of women in politics, economy, culture, etc. becomes more obvious. Therefore, further research is still needed to provide more data and analysis of the use of technology especially by female users. Finally, the contributions of engagement in online learning achievement still need a further study. More analysis is still needed to find the kinds of engagement which best contribute to the learning achievement.

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DEVELOPING STUDENTS' RESPONSIBILITY THROUGH NUMBERED HEAD TOGETHER MODEL IN SOCIAL SCIENCE LEARNING AT ELEMENTARY SCHOOL

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Abstract
This study is aimed at developing the application of responsibility through the implementation of Numbered Head Together model in the social science learning process. The type of this research was descriptive analysis using qualitative approach. The subjects of the study were the third-grade students and teachers of social science learning in Sukoharjo Sub-district. Data collection techniques in this study were documentation studies, observation, and interviews. The findings of the research were analyzed using interactive analysis of Miles and Huberman model and presented through descriptive narrative text. The results of the research show that: 1) the learning result of the third-grade students in social science subject is not maximal yet, 2) the students are not aware of the social science learning objectives for their future, 3) the teachers remain applying the conventional model, 4) the teacher has not implemented the social science learning process involving the students' responsibility. The characteristics of Numbered Head Together learning model are suitable to be applied in learning social science because it makes the students serious in learning, develop thinking skills, and improve social relationships among students that can be used as a means to develop the students' responsibilities in the social studies learning process.

Keywords: numbered head together, responsibility, social science learning

Introduction
Education is the real effort in order to generate the learning process that can develop the students' potentials. To determine the maturity of children for school has a great significance for their further development (Velickovic, 2015). The potentials can be in the form of spiritual, intelligence, skill, and character needed for themselves. The goal of every school is to be the best, to be failure-free and to make possible that every child learn it is own talents and capabilities (Delceva, 2014). The current education system in Indonesia bot only covers science but also the character building. The average age

during primary school age is a critical phase to form the students' attitude or character (Prihandoko, 2017).

The treatment of the individual characteristics in the practice moves in two directions: first, creating a flexible education process by every teacher according to the individual potentials of the child/student; second, creating an educational context which is equal for every student in the same grade (Majovska, 2015). Character influences the students' mind-set that will affect the students to handle the situation. One of the students' influential characters is the learning responsibility. Responsibility is individuals' feeling in order to fulfill their tasks independently using their full commitment. Responsibility is the attitude to perform the obligations both in the family and school by giving the best. It can be synthesized that responsibility is an individual's attitude to perform obligations optimally using his or her own ability both in the scope of the family and school.

In relation to the learning process, the character of responsibility must be possessed by the student while performing the teachers' duties. Through the teachers' assignment, students can be responsible for completing the task carefully and on time (Rahayu, 2016). There are three indicators assessed from the learning responsibility, namely: submitting the task on time, doing the assignment as it is instructed, and doing the task independently. In addition, there are the others indicators of responsibility including: performing the tasks without prompting, showing initiatives to overcome problems, not cheating in doing the task. It can be concluded that the indicators of responsibility are as follows: involving in learning process seriously, doing individual tasks independently, doing group work together, completing tasks on time.

Based on the result of documentation study, the result of mid-term test in social science subject at SD Negeri Sukoharjo sub-district has not been optimal yet. The findings are also supported by the results of teacher interviews. The interviews revealed that the students have not comprehended the material of social science well IPS. It is due to the wide scope of social science material that are required to be mastered. It is also strengthened by the results of the observations that indicate that; 1) the students were not fully focused, 2) the students were less enthusiastic to follow-up the lessons, 3) the students frequently missed the classes, 4) the students did not submit the assignments on time, 5) the students disturbed other students while studying, 6) the students did not participate in group discussions, and 7) the students cheated while doing the individual task.

According to Sardiman (2010), social science subject that needs to be memorized is often considered to be boring and unattractive subject as well as the burden for the students. Meanwhile, social science is essential to be learnt due to its importance daily life. The design of the social science curriculum is aimed at helping the students introduce the world. Social science material is a basic concept of the introduction of the students' environment (Azizinezhad, 2013). Distinguishing the concept of the various parts of the environment is not easy for the students because they are required to understand each concept appropriately. Misconceptions will be worse if it is not fixed since the concepts taught at school become the foundation for the understanding of further material.

Based on the results of documentation studies, interviews, and observation, the cause of social science learning outcomes that has not been optimal yet is students who are not responsible to involve in the learning process. The teachers need to address the problem by finding a solution. One of the solutions is through the implementation of innovative learning models. The selection of learning model can be adjusted to the students' characteristics. Therefore, it can affect the students' responsibility that possibly influence the results of social science learning. Eysink (2016) shows that innovative learning model in social science learning is aimed at easing the students' burden in mastering the material about the environment that has the wide scope. Learning model becomes the teacher's guidance in conducting the learning. Applying the right learning model will provide stimulus for students to be serious in learning.

Students need to be taught group skills to be motivated in learning and to take responsibility while following the learning process (Fatimah, 2012). One of the learning model that is considered suitable to be applied to develop the character of responsibility that is model of learning Numbered Head Together (NHT). NHT is a group learning activity by making sharing of reasons, then considering the right answers to solve the problem. The syntax of NHT is four, numbering, asking questions, thinking together, and answering questions (Firda, 2016). Syntax numbering is teacher divides the students into several groups and assign different numbers in one group. Syntax asking question is teacher asks questions to the students to be discussed with the group. Syntax thinking together that is when students discuss with the group. Syntax answering the question that is when the teacher randomly summons a number to perform in front of the class. The advantages of the NHT model are: students become ready, discuss seriously, and smarter students can help other students who have difficulty. Based on the excess of NHT, it is necessary to conduct a qualitative study on the application of the model when learning social science material of natural and artificial environment. Therefore, the purpose of this research is to develop the application of responsibility through the application of the Numbered Head Together (NHT) learning model in the social science learning process.

Method

The method used in this research is analytical descriptive. The subjects of the study were 111 third grade students and 4 teachers of social science subjects in elementary school, namely SD N Gayam 05, SD N Jetis 01, SD N Sukoharjo 01, SD N Joho 04 located in Sukoharjo sub-district, Sukoharjo regency 2017/2018. Data collection techniques used in this study are documentation studies, observation, and interviews. Documentation study was done through analysis of UTS result of social science subjects. Observation was completed during the learning process of social science took place with reference to the observation guidelines that had been prepared. Activities observed include aspects: learning models applied by teachers, and attitudes of students while following the learning process.

Interviews were conducted on four third grade teachers as subjects of social studies subjects. Interviews were used to obtain data, including: teachers'

perceptions of the implementation of the social science learning process, student attitudes during the learning process of social science, teacher expectations on the development of social science material today. Technique of data analysis result of documentation study, interview, and observation using interactive analysis of Miles and Huberman model. Analysis of interactive data on Miles and Huberman model was done through three steps: data reduction, data presentation, and conclusion. The result of data analysis of research findings then presented in qualitative form through narrative text to describe application of model of learning Numbered Head Together to student responsibility attitude.

Findings and Discussion

Research activities began with documentation study. Documentation study was done through analysis of final exam results of natural and artificial environment. The value of KKM (Criteria Completed Minimum) of four primary schools the same, which amounted to 70. UTS results showed from the fourth elementary school as many as 65 students or 58.56% who reached the value above the KKM, while 46 students or 41.44% has not achieved value above KKM. Learning outcomes show not yet optimal because there are still 46 students or 41,44% who do not reach the value above KKM. Findings on learning outcomes that have not been optimal have relevance to the implementation of the learning process. Therefore the analysis of the learning process through observation activities.

Analysis of learning process of social science was conducted through observation when learning at SDN Gayam 05, SD N Jetis 01, SD N Sukoharjo 01, SD N Joho 04. The process of implementation of social science grade III teaching still applied KTSP curriculum. Focusing material on the natural and artificial environment at home and school. The results of observation showed: first, there were three elementary school which the learning process was still dominated by teacher's question and answer. There was one primary school that the teacher found to involve students in the learning process, such as group discussions, appoint students to answer questions, and made use of the school environment as an example of the material being taught. Second, the behavior of students who interfered with other students, students often permitted to restroom, students submitted tasks over time, and cheated the work of other students. Based on the observation, social science learning activities are limited to teachers transcribing materials about the natural and artificial environment to the students. Learning resources used were still limited, in the sense that teachers had not utilized the environment around the students optimally in order to support student learning responsibilities.

After observation of social science learning process, the researcher interviewed four grade 3 teachers of SDN Gayam 05, SD N Jetis 01, SD N Sukoharjo 01, and SD N Joho 04. Interview activities focused on the constraints experienced by teachers during social science learning process. Problems experienced by teachers with the source of learning, time, material, attitude of student responsibility in school. First, the constraints on social science source and teaching materials were limited to government guidance books, but there was one

teacher who used the internet to add material references. Second, the constraint on time allocation social science that was not more than three hours lessons in a week, whereas social science material has a wide range, whereas for third grade students took a long time to absorb the material to be understood well. Third, natural and artificial environment materials had various concepts that must be mastered by students, but there were still students who had not been able to distinguish between mountain and hill, lake and swamp, or forest and garden. Fourth, the goal of social science learning is not yet realized by the students, whereas social science is a means of students to behave responsibly in the society, besides the social science material provides knowledge and experience about the life of the society which is always growing and changing.

Based on the results of documentation studies, observations, and interviews, appropriate solutions through the application of innovative learning models. The importance of applying the learning model to train students working group and train the responsibility for completing the task (Katrien, 2010). The Numbered Head Together (NHT) model aims to increase student activity in learning, to train leadership in making decisions, and to increase the character of learning responsibility (Agustin, 2013). This process allows students to interact with each other to exchange insights, be responsible for completing tasks, and generate confidence when expressing opinions.

Learning activities through the application of NHT models to natural and artificial environment materials can be preceded by material distribution. Material is made differently and the level of difficulty is gradual at each meeting. First, understanding and characteristics of the natural and artificial environment at home and school. Second, classify the types of natural and artificial environments at home and school. Third, the benefits of natural and artificial environments at home and school. Fourth, how to maintain or destroy the natural and artificial environment at home and school. Fifth, devise a new idea in the maintenance of natural and artificial environment at home and school.

The first syntax of the NHT model is numbering. Numbering is done after group formation and given to each member of the group. Group formation is done by teachers because it is considered to have understood the ability of each heterogeneous student. Students are not given freedom in the formation of groups because they tend to choose a friend who liked. The number works when the teacher calls the group representatives to present the results of the group discussion. Teachers do not designate certain students who are considered high or low. This is intended to involve all students in learning.

The second syntax of the NHT model is the questioning. The stage of asking questions to students is done on the core activities, i.e. after students receive and study the subject matter of the teacher. Questions were made in the form of group worksheets worked with groups. In this process the students do not know the number mentioned by the teacher to present the result of the discussion in front of the class. This process can make the students responsible for understanding the answers to the results of group discussions.

The third syntax of the NHT model is thinking together. Teachers provide group opportunities to work together to solve problems on group worksheets. This

process allows each group to unite the head (this stage can be called head together) or discuss to think the answer that is considered most appropriate. Each member of the group has the same responsibility, because in addition to mastering the answers, the student must also ensure all group members are able to answer questions from the teacher. Students are required to be unselfish with members of one group, students who have high ability must teach students who have low ability.

The syntheses of all four NHT models answer questions. After the students think together with the group, the students called the number forward to the class to present the results of the group discussion, while the unmarked student takes careful attention to the student who is presenting and responding. All students have the opportunity to present group answers. This process simultaneously trains students to express opinions, and communicates with other groups, in addition to this process indicating that all group members have equal opportunity to achieve success in learning. The teacher then rewards the best group, and guides the students to conclude the subject matter.

Based on the explanation of social science learning design through the application of NHT model, it is seen that the delivery of natural and artificial environment material is done gradually from the level material easy to difficult. The design of learning activities is oriented towards student-centered learning, interesting, and refers to the required material competence (Hartoyo, 2009). In addition to the material, the application of the NHT model demands a character that students must possess that is group and individual learning responsibilities. Group responsibilities are needed when students discuss with the group to complete tasks on time. Individual responsibility is required when students have to master the answers to the results of group discussions, and when students present the results of group discussions because the numbers are randomly selected by the teacher.

It should be noted that in applying the NHT model there may be some obstacles that teachers may experience. These constraints include large numbers of students and not even, there are students who are busy themselves outside of learning to interfere with other students, limited duration, less active student response, and low self-confidence of students. Therefore, these constraints need to be anticipated by finding the right solution. First, a large number of obstacles cannot be anticipated by applying a random method of counting, for example the teacher wants to divide the class into 5 groups, each student counting one to five sequences according to the seat, students who mention the same number gathered into one group, this way is considered fair because it allows students to mingle with other students and do not choose a particular friend, besides the teacher can divide the group based on the level of student ability, for example students who have high ability are divided early and appointed as group leader, while other students divided by way of random method count. Second, the constraints of students who are busy with other activities outside of learning and tend to disturb other students can be anticipated by the way the teacher informs that the learning process is a group discussion but the results of the discussion are presented individually randomly appointed by the teacher. Third, limited time duration

constraints can be anticipated by optimizing the time as effectively as possible, for example for each implementation of the teacher syntax to give the duration of time to be obeyed by the student, besides before the lesson starts the seating is arranged in groups. Fourth, passive student response constraints can be anticipated by the way teachers require each group to make one question for the student who is presenting in front of the class. Fifth, low student confidence constraints can be anticipated by the way teachers build students 'self-confidence with applause, with the clapping or singing spirit of the group can lead students to foster self-belief and guide students' courage for presentation in front of the class (Novitasari & Abdullah, 2013).

Some of the constraints that may occur when applying the NHT model to social science learning can be anticipated with a solution tailored to the constraints. The goal is that in the future NHT model can be applied maximally, either for different class level or other subjects. The learning process through applying the NHT model gives students opportunities to build ideas and consider the most appropriate answers. Indirectly train students to share information, listen carefully, calculate answers appropriately, and cultivate student learning responsibilities, so students become more productive in learning. Therefore, through the application of the model of learning Numbered Head Together is expected to be a solution as a means for the development of the character of student responsibility.

Conclusion

Responsibility is the character possessed by individuals to perform obligations optimally with their own ability, both in the family and school. In relation to the learning process, the character of responsibility must be owned by the students, because it is required when carrying out the task given by the teacher. Indicators of learning responsibility include: taking the learning process seriously, doing individual tasks independently, doing group work together, completing tasks on time. Empirical facts of social science learning in the field have been analysed from various angles show that social science learning result not yet optimal. The cause of the students are less focused, not enthusiastic to follow the learning, often permit out when learning takes place, not timely collecting tasks, disturbing other students while studying, not participating during group discussions, and cheating while doing individual tasks. Some attitudes of students who are not good show that the attitude of student learning responsibility has not appeared on the students themselves. Efforts can be made to improve the learning process through the application of innovative learning models. The Numbered Head Together (NHT) learning model is a group learning activity by sharing reasons, then considering appropriate answers to solve problems. There are four NHT syntaxes that are numbering, asking questions, thinking together, and answering questions. Syntax numbering is the teacher divides the students into several groups and gives students different numbers in one group. Syntax asks the question of the teacher asking questions to the students to be discussed with the group. Syntax thinking together is the stage when students discuss with the group. Syntax answer the question is a session when the teacher randomly call

a certain number. The constraints that can occur when applying the NHT model need to be anticipated with solutions tailored to the constraints. The goal is that in the future NHT model can be applied maximally, either for different class level or other subjects. The learning process through applying the NHT model gives students opportunities to build ideas and consider the most appropriate answers. Indirectly train students to share information, listen carefully, calculate answers appropriately, and cultivate student learning responsibilities, so students become more productive in learning. Hence through the application of the model of learning Numbered Head Together is expected to be a solution as a means for the development of character responsibility of students.

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LEARNING POETRY AS A STRATEGY TO DEVELOP STUDENTS' TEACHING SKILLS

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Abstract
Generally, learning poetry has some functions which deal with oral language development, student learning style expansion, world engagement with its content, and cultural awareness exploration. The fact is that not only does the Indonesian government try to put aside learning literature from all language study programs, but also some practitioners argue that there is no link between learning poetry and developing students' teaching skill in some teachers training departments. This article argues that learning poetry can be a medium to develop students' teaching skill in sharing the knowledge independently and creatively. Some practices that have been conducted in two poetry classes of English Language Education Program, Sanata Dharma University in 2017 are being discussed in relation to improve students' teaching skill as preliminary activities before having a micro teaching class. Additional data about students' response toward the practices are also shown. It was found that 82% students agreed that those practices developed students' teaching skill in sharing the knowledge that they obtained.

Keywords: learning poetry, practices, students' teaching skill

Introduction

The Indonesian Ministry of Research, Technology and Higher Education assigned all university study programs to set their name based on ministerial decree number 15 year 2017. One of the implications of the decree is the elimination of the word literature in study program name, e.g. Indonesian language and literature education study program changes into Indonesian language education study program. Some regulations in elementary and high schools were also made so that teachers would focus more on language learning and put aside literary works as learning materials. Those governmental efforts may lead to a degradation era where young generation will not experience the benefits of reading literary works as human expression and thought. One of the benefits deals with knowing the different culture, religion, ethnic that makes students tolerate others' differences. Although the learning process of this sense of tolerance faces many obstacles as stated by Suparno (2017), we should not give up on teaching it. The real implementation of using literary genre for teaching and

improving others' culture respect was done by Yektiningtyas and Modouw (2017). They infused Sentani culture in their English learning materials.

Folktales are chosen as learning materials for Elementary School students, malo for Junior High School students, the procedure to make kayi/ifa for Senior High School students. This infusion hopes that young generation is able to learn English as well as to acknowledge one of the cultural heritages of Papua. They can be strongly rooted in their culture and respect others' culture (p. 40). From that explanation above, the elimination of literary works as teaching materials is considered high risk.

Sanata Dharma as one of universities in Indonesia underlines the importance of studying literary works in learning language by doing some actions. First, this university will not eliminate the name of literature in its language study program (Pendidikan Bahasa dan Sastra Indonesia & S2 Pendidikan Bahasa Sastra Indonesia). Second, some practices in relation to studying literature are still maintained. One of them is the learning poetry in English language education study program.

Relating to language acquisition, many experts claim that learning poetry has many benefits. Hadaway, Vardell, and Young. (2001) stated that learning poetry can develop student's oral language due to its regular practices in reciting several poems. Aydinoglu (2013) integrated learning poetry with vocabulary teaching. Students could enrich their vocabulary by having poems as the material. Hanauer (2001) said that by having poetry reading task, students realized the gap between their culture and the culture of second language of the poems in order to understand the possible meaning and uses of the words. It also proves that learning poetry has connection with cross cultural understanding. It explores students' cultural awareness. For the real teaching and learning activities, Richard (1988) proposed some teaching methods such as storytelling and role play. Those experts agree that learning poetry brings good benefits for students and it was practically done. It means that students' competence for their language acquisition can be gained from learning poetry.

Beside its' benefit for language acquisition, learning poetry gives positive effect to students too. Reid (1995) connected learning poetry with students' learning style expansion. Pullinger also reminds that as teachers, we should not forget to motivate students to learn value in discussing poems. Then, students may relate it with their experience and get better understanding about humanity. Their engagement with the world is one of the results of learning poetry (Pullinger: 2012). In the other words, students may improve their compassion and conscience from learning poetry. For pre service teachers, a study that was conducted by Dymocke and Hughes (2009) in UK and Canada helped them in gaining self-awareness of being a writer and future teachers of writing. By having wiki environment, future teachers collaborated to support their professional learning. In Indonesia, the growth of poetry is undeniable. We have at least "50 title of Indonesian children poems written by child poets" that were analyzed by Mulyono (2018, p. 228).

Knowing those benefits and its dynamic of learning poetry, the writer aims to show the connection between learning poetry and improving students teaching

skill. This paper focuses more on the practices on teaching poetry for second language learners to improve their teaching skill. Besides, students' perspective toward the practices is provided too.

There are many definitions of teaching. Generally, teaching relates to a profession namely teacher who causes students to learn or to understand new things. Smith (2015) defines teaching as a specific action to help students to learn things. He also mentions that it relates to learning and sharing the belief in life. In line with Smith, Hirst (1975) states that teaching is intended for someone to learn something. Based on those definitions, there is a red line about teaching in the condition of learning. One of many ways for achieving the learning condition, which is clearly stated by Smith, is the activity of sharing. Adapting previous definitions, teaching in this article is the ability to share knowledge from one source (a future teacher) to audience (classmates) about poetry subject so that his or her classmates will learn and understand the material. Teaching skill that is intended to be improved is the ability of sharing knowledge about poetry.

There are four different learning styles based on Fleming's theory (2012). Those four styles relate to sensory modalities that students preferred, namely: aural, visual, read or write, and kinesthetic. Some students prefer to see, some others prefer to hear, some students like to read or write, and the rest – they like to do or practice it. This theory has a connection with Dale's theory. Dale cited by Dugan (1955, 244) also categories those four learning styles into six levels of remembering. He states that after two weeks, students generally remember 10% of the material that they read, 20% from all they heard, 30% the visual that they saw, 50% when they both heard and saw, 70% from what students said and wrote, and 90% when they really did that.

It is important that learning activities accommodate those students' four modalities and preserve the materials that they have learned. For accommodating students' four modalities, the activities which are done in the class vary from listening, speaking, reading, writing, watching and practicing. An effort to maximize the capacity of students' memory of the materials can be done by having a real implementation. Students need to do something so that they will remember more.

There are some activities to apply four modalities and maximize students' memory, namely: presentation, focus group discussion, role play, and gamification. Those are wrapped with developing students' autonomy. Students understand the goal of the lesson and find their own way to achieve the goal. In this case, students may choose the theme and the activity that they like for the final project based on their interest. Chickering and Gamson (1987) state that students' interest gives good impact for a better learning condition.

Method

Since the focuses of this paper are two, namely practices in Poetry classes to improve students' teaching skill and students' perspective toward the practices, the data are classified into two groups. The first data related to practices as a connection between Poetry material and students' teaching skill were gathered from observation for one semester (February–June 2017) in two Poetry classes of

ELESP Sanata Dharma. The results of the observation were noted in the note book. The second data in relation with students' perspective toward the practices were obtained from spreading a questionnaire to all students who have attended those two Poetry classes. The type of questionnaire was closed one with Likert scale from one to four (1=totally disagree, 2=disagree, 3=agree, and 4=totally agree). The distribution of questionnaire was done in the last meeting after all learning activities have been finished. There were 68 students who participated. First class was E class and it consisted of 33 students. Second class was B class and it consisted of 36 students. One participant was absent in the last meeting. These two classes were chosen out of five classes due to the fact that only those classes which implemented specific practices that have been stated in previous chapter. There was not any clear distinction between those two classes. The students got same treatments in the beginning and decided the practices to connect between poetry material and teaching skill.

The presentation of the first data about the practices is done descriptively. The second data are analyzed by calculating the scale to find the mean and these data are presented quantitatively.

Findings and Discussion

Learning poetry material to build the expertise in teaching

In the first meeting, lecturer delivered the goals of the course that dealt with poetry, its elements, appreciation and teaching skill, then asked students several possible activities to achieve the goals together. There were some discussions about students' interest & idea and a debate among students too. Students decided the activities and made commitment based on class decision together with the lecturer. In this phase, students realize that being a teacher needs to be responsible for the decision that they make. Not only did student deal with the freedom of choosing the activity to achieve the goal of the subject, but also they dealt with the freedom of choosing the poem that they liked or knew. They independently chose their poem as the material of their analysis. For those who were not familiar with poetry, they themselves began to explore and look for a poem that was easy for them. As future teachers, students learn to have their own independency to look for the appropriate materials to be taught.

In the second up to seventh meetings, there were students' presentations that were wrapped with a focus group discussion. Students learned independently about material that would be presented, discussed in their group about the material and its job distribution, presented their findings about the elements of poetry and its analysis toward their own chosen poem, and had some feedbacks and questions from other groups in the class. Lecturer added more information, proposed several thought provoking questions and concluded the result of the discussion. Through those activities, students learned to collaborate with partners to obtain their individual goal as a preliminary experience of networking, share the knowledge that they studied before to their friends in the class, make sure that their friends understand the material by having a whole class exercise and answer friends' question in relation with the material that they have delivered. Focus group discussion is the medium to help students discuss the material in the class without

lecturer's interference. Presentation in focus group discussion allows students to learn that being a teacher needs to read, learn and understand the materials before they present them. Students also realize the need of participants' feedback to make sure that the materials is well received or understood. Focus group discussion was recognized as a different form of peer feedback. Teacher needs to have a suggestion from colleague in the implementation of certain method and the choice of materials.

Throughout the three meetings before the final test, students started to discuss the plans of their previous decision that they have made in the first meeting in the group. Students of E class decided to have a poetry performance. This class was divided into two big groups based on students' choice. Those groups created their own poems, recited those poems, and arranged its' musical performance. Their chosen themes were love and nationality. Students of B class were divided into six groups. Their focus was to teach a poem with an interesting way. Some groups had a talk show, two groups had a drama of their chosen poems and others had a pantomime. The lesson that they got in this project was that teachers needed to develop creativity to deliver the materials.

Presentation, forum group discussion, students' choice for their final project accommodated four styles of learning, namely aural, visual, read or write, and kinesthetic. Before conducting presentation, students tried to look for specific information with different ways, for example reading some websites, watching YouTube videos. After they got the information, they created a power point. Those activities as the preliminary before the presentation made students activate the aural, visual and read as learning styles. For kinesthetic learning style, final project accommodated it by having poetry performance, talk show, drama or pantomime. The most important thing was that students implemented teaching poetry materials in the class for real and it led them to memorize more for the materials that they have learned. Students practiced directly, taught other friends, had discussion and did their choice for their final project. Those activities helped them to improve their teaching skill in the way of sharing the knowledge that they got to other students. Teaching cannot always be defined as a formal process in the class where students and teacher exist. Teaching is a way to make others understand the knowledge and to achieve the goal together by supporting each other.

It was interesting when a group consisted of three members presented their poetry materials on how to implement sociological approach first by showing a video of a song entitled "Imagine" by The Beatles without having any slide to share the knowledge. They asked students to sing together in the beginning and gave some questions to their friends about the connection between a song and a poem. After the discussion, they shared the background of the song based on the reality that happened at that time that was the world war. Then, they also asked about the lyrics of the song as a proof of the poet's feeling toward the war. There were other students appreciated their presentation by saying directly that their presentation was interesting and two students asked some questions to the group. In this process, students' creativity to develop poetry material and to deliver it were stimulated. For visual learners, they watched the video. Students who were

good at listening, they also listened to the song. Moreover, they also sang the song as a real implementation of their kinesthetic. Those activities dealt with four different kinds of learners as mentioned before. The six levels of remembering were also accomplished because students have read the lyrics, listened the song, watched the video, sang it, and asked some questions. For students who presented the material, before teaching, they read and understood the concept of sociological approach first, tried to find the appropriate song and listened it, discussed with other members in the group and finally they shared it as a real implementation. It was the example of 10% up to 90% Cole's cone of learning.

To measure their understanding, there were a midterm test two and quizzes. All the questions were taken from the materials that have been presented. Based on the result taken from those tests, students began to understand some approaches to analyze a poem and had their original interpretation toward their chosen poem. They also presented the material well and committed for completing project in their group. During focus group discussion, they were actively asking questions. The activities that have been done in those Poetry classes refer to students' competence for understanding the materials and for having a practice in sharing the materials as an element of teaching. Those activities involved both students' learning autonomy and students' creativity

Students' perspective toward the practices

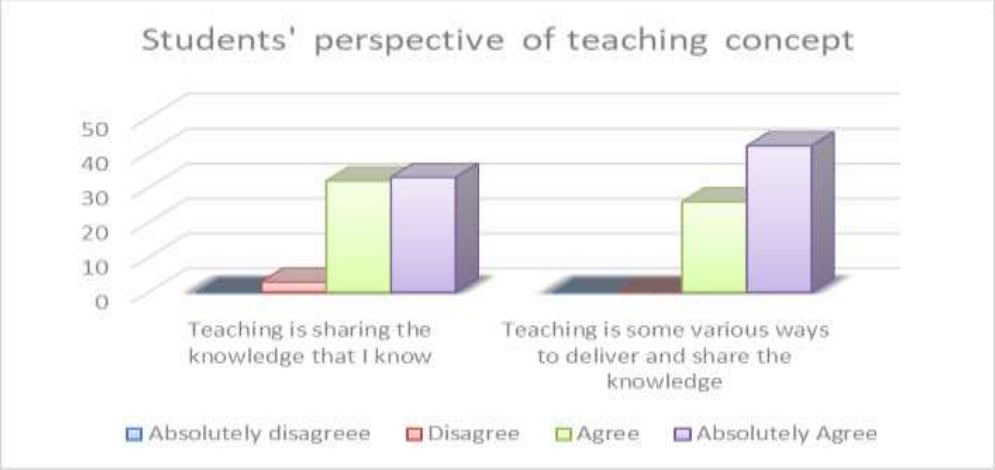
There were two kinds of student's response toward the practices. The first was the written form taken from SIA Dosen (Lecturers' academic information system). The second was the statistic result of the questionnaire distribution. These were some students' comments on SIA:

No	Students' feedback in Bahasa Indonesia	Translation
1	*Aktivitas seperti presentasi kelompok juga membantu mahasiswa untuk belajar secara kelompok dan dapat memahami materi dengan baik. Dosen juga selalu memberikan feedback dan merangkum apa yang telah dipelajari pada saat itu.*	Activity such as group presentation also helped students to learn and understand the materials well. Lecturer also gave feedback and summed up all materials that has been learnt at that time.
2	*Strategi pembelajaran sudah sangat baik, mahasiswa dapat mengembangkan makna bahkan menganilisis puisi dengan kreatif.*	Learning strategy was already very good, students could develop meaning even analyze poems creatively.
3	*Ujian akhirnya asik, nggak kaya mata kuliah lain. Dosen selalu menanyakan pendapat mahasiswanya ketika ingin menentukan pilihan di kelas.*	Fun final test, it was not like other subjects. Lecturer always asked students' opinion when she wanted to decide the choice of the class.
4	*-Beliau memberikan pilihan kepada mahasiswa untuk menentukan final project. - Beliau sangat mengapresiasi apa yang telah dikerjakan oleh mahasiswanya. -*	She gave some choices to students to decide final project. She really appreciated what had been done by her students.

Based on the data above, students' freedom for choosing the materials & the project in achieving the goal of the course was well appreciated. It was the main key to connect some poetry materials with the improvement of teaching skill in two Poetry classes.

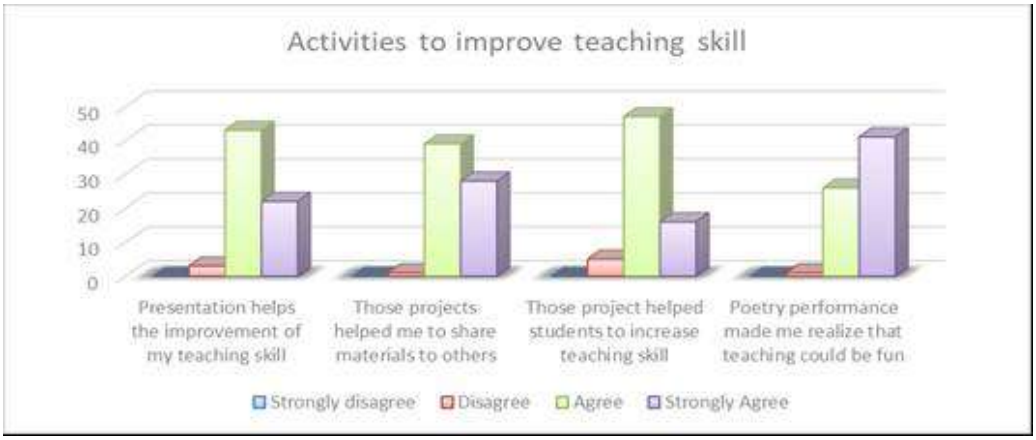
Before having the data analysis of students' perspective toward the practices for improving their teaching skill, most students agreed that the concept of teaching had a close relation with sharing the knowledge and various ways to deliver it. It was shown in the figure below:

Only three students did not agree that the concept of teaching was about sharing the knowledge and none of students totally disagreed. There was not any student who disagreed or totally disagreed that teaching related to various ways of delivering and sharing the materials. In detail, 32 students agreed and 33 students strongly agreed that teaching concept was about sharing and the number increased to 26 students who agreed



and 42 students who totally agreed that teaching related with various ways of delivering and sharing the knowledge. Those findings showed that most students had a concept that teaching had a close relation with sharing activity.

There were some activities done based on students' choices namely presentation, projects and poetry performance. The first part dealt with presentation, the second and the third parts were some projects and the last was poetry performance.



For presentation activity, 43 students agreed and 28 students strongly agreed that presentation helped their improvement of teaching skill; only three students who disagreed. Its' mean was 3.28. Meanwhile, the mean of some projects reached to 3.38 for sharing materials improvement and 3.16 for students' teaching skill improvement. The last activity that was poetry performance had the highest mean of 3.59. From the result of the questionnaire, all the mean reached to three as the level of agreement. It indicated that students' felt those three activities namely presentation, projects and poetry performances had already helped them to develop their teaching skill. The materials were closely related with teaching as the theme of both Poetry classes.

From the data above, students agreed that those activities could be the means to develop their teaching skill and furthermore to start learning their teaching expertise. There were two important aspects that they realized to be had. The first was their independency as autonomous learners when they had to master the materials well before sharing. The second was their own creativity to deliver the materials so other friends would understand the material because their interesting way to share the knowledge mattered. Other teaching expertise that could be gained dealt with students' awareness of collaboration in their team to achieve the goal together. It symbolized the relation that needed to be built among teachers in a school. Briefly, their teaching expertise began with their independency of learning, creativity of sharing and maintaining good relation with other members in their group.

Conclusion

Literary works, in this case poems, are able to be used as materials to develop many skills of those who study them. Based on its nature as dynamic materials, poetry can be used not only for improving students' oral skill but also for improving students' teaching skill especially for sharing the material. To sum up, there are some important practices that need to be done: 1) giving a freedom for choosing a poem that a student really likes, 2) having a commitment to achieve the goal of the course together by having an open discussion, 3) involving independency and creativity of students, 4) accommodating four styles of students' learning. In a nutshell, lecturer can have some literary works including poetry as a material for future teachers due to its benefits, namely: improving teaching skills through its real practices, gaining students' competence for its language acquisition, exploring students' conscience and compassion. Learning literary works has a lot of functions for students' life, even for formal one that is to develop teaching skill for students of education program.

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THE APPLICATION OF SOCIAL SKILL TRAINING AS INTERVENTION TO IMPROVE SOCIAL SKILL FOR A SMALL NUMBER OF FRESHMEN STUDENTS

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Abstract
Being freshmen is a challenge for college students. They must encounter a lot of demands in their college especially their social skills. Prior research showed that students of Universitas Indonesia reported their social-psychological relations problem in their social environment. Freshmen must have adequate social skills in order to encounter demands in social relation. This study aimed to increase social skills for Universitas Indonesia's freshmen through the application of Social Skill Training (SST). A pre-test, post-test design and one month follow up test were administered. Subjects of this study were seven Universitas Indonesia's students (freshmen) with age range from 17 – 18 years old, attended three sessions with two hours per session. Participants reported that their social skills increased, indicated by improvement in Social Skills Inventory (SSI), and also by qualitative evaluation. Group dynamics and experiential learning allowed them to learn from the experiences of other participants. Therefore, the application of Social Skills Training effectively increased the social skills for Universitas Indonesia's freshmen. Further research is needed to examine this intervention using a larger sample, control groups and in-depth interview for qualitative evaluation.

Keywords: college student, freshmen, social skill, training

Introduction

People who continue their level education to the college definitely encounter some changes in their lives. At this stage, they encounter the changes related to school system, relationship with peer from different areas and cultures, and high need of achievement (Santrock, 2012). They will leave home, friends, familiar environment, and must adapt to the new environment (David & Nită, 2014).

The changes evoke the challenge that must be encountered by the freshmen when they enter the college. Some of the usual problems that arise include anxiety, depression, loneliness, and feel alienated (Kneipp, Kelly & Cyphers 2009). A problem of social relations is one of the four main problems in Universitas Indonesia's student (Utama, 2010). Prior research showed a total of 9,1% of Universitas Indonesia students have severe psychological problem when

dealing with their social environment such as feel ashamed, uncomfortable with others and have no friends on campus (Utama, 2010). The statements below are the description that encountered by freshmen student when they enter the university/college life.

"I want to be more open. I know that I'm introvert and I'm not always open to others, except with people I've known for a long time. But because I know that Universitas Indonesia demand their students to be more active, so what else?" (ER, female, 17 years old, Faculty of Humanities – Universitas Indonesia)

"I want to eliminate my social anxiety that I often encounter when dealing with nw peoples, especially in the university environment" (MRU, male, 18 years old, ER, female, 17 years old, Faculty of Humanities – Universitas Indonesia)

Sekararum (2012) did an interview with the students related to the demand they encountered being the freshmen students. The interview results showed that to be successful in the university, not only being smart academically but also must have skills to build good relationship with others which is needed when they work in group in class, getting information about academic context, or deal with lecturers or campus staffs. Freshmen students are in emerging adulthood stage which have task to build relationship with others. Social skills at emerging adulthood stage play an important role considering their need for social integration and the search for self-assertion and independence (Hohendorff, Couto, Prati, 2016). People must have good social skill to fulfil the demands of social environment (Segrin, 2001). It can be concluded that social skill is the communication ability that is very important for a university student.

Riggio and Reichard (2008) define social skill as an ability to express the self when interact with others, able to read and understand any social situation, having knowledge about social roles, norms and rules. A person with low social skill will encounter difficulties when interact with others, limit their chance to build their relationship. They also probably have to experience any psychopathology like depression, social phobia, the onset of schizophrenia and also psychosocial problems such as loneliness, anxiety and depression (Segrin, 2001). On the contrary, a person with good social skill, will deal with any positive things psychologically like social support, success in social relationship, create the positive skill like empathy and increase the self-esteem (Sekararum, 2012).

There are some interventions that can be done to increase social skills; one of them is training. Social skill training is an intervention that makes individual gain a number of basic behaviors so that they get the desired impression from others and improves success in social situation (Spence, 2003). Researcher on this study will use the module arranged by Siregar (2012) who conducted Social Skill Training to increase social skill and decrease psychological distress of university students. This intervention is focused on experiential learning principle where participants can learn actively from the concrete experience and testing implications of concepts in new situation. Hypothesis in this study is social skill can be improved through social skill training.

Theory

Social Skill

Social skill is an ability to express oneself in social interactions, the ability to read and understand different social situations, knowledge of social roles, norms, and scripts, interpersonal problem-solving skills, and social role-playing skills. Social skill consists of three basic skills: skill in expression, skill in recognizing and decoding messages from others, and skill in regulating and controlling communication behaviors (Riggio & Reichard, 2008).

Social Skill Training

Social skills training involves intervention that enable person to acquire an adequate repertoire of basic behaviors that have a strong impact upon the impression made upon others and that increase the chance of successful outcomes from social situations (Spence, 2003)

Experiential Learning

Experiential learning is a learning approach which focused on students. Students are required to be actively involved, process and interpret their concrete experience and have a high intention to apply the learning process (Supratiknya, 2009). Experiential learning approach according Lewin (Kolb, 1984) consists of 4 cycles. First, people get a concrete experience directly. Second, observations and reflections, people reflect on their concrete experience gained. Third, formation of abstract concepts and generalizations, a process of assimilation and integration of the experiences. Fourth, testing implications of concepts in new situation, where people apply their learning result in daily life.

Method

This research used a single-case study design, pre-post intervention. Participant was evaluated before and after the intervention phase (pre-test and post-test) and upon 1.5 month follow up phase. The measurement of social skill used Social Skill Inventory (SSI). It consists of 90 items which include 6 dimensions; emotional expressivity, emotional sensitivity, emotional control, social expressivity, social sensitivity and social control (Riggio & Carney, 2003). Participants of this intervention were freshmen students of Universitas Indonesia who have problem with their social skill which seen by their Social Skill Inventory score. This intervention was conducted at Faculty of Psychology, Universitas Indonesia.

The intervention used convenience sampling method to select the participants with consideration of their availability and willingness to respond (Graveter & Forzano, 2015) Researcher conducted a screening process by administering a questionnaire (Social Skill Inventory and open questionnaire) which will be utilized as a pre-test data. The questionnaires are distributed on the internet using google form to Universitas Indonesia's freshmen student. Participants who filled the questionnaire were selected by researcher based on their Social Skill Inventory score below and the willingness to join the intervention. Researcher on this study will use the module arranged by Siregar (2012).

Table 1. Content of Intervention Sessions

Session	Aim
I Share	Participants realize the importance of understanding and self-expressing effectively and understanding how to develop it.
I think	Participants realize that negative thought is an obstacle in presenting social skills and understand how to cope it.
I Feel	Participants realize that negative emotion is an obstacle in presenting social skills and understand how to cope it.
I Express	Participants realize the importance of verbal and nonverbal communication appropriately and understand how to develop it.
I Care	Participants realize the importance of understanding and empathy with others and understand how to develop it.
I Listen	Participants realize the importance of active listening as a positive communication behavior and understand how to develop it.

Findings and Discussion

Data Analysis

Data were analyzed quantitatively using Friedman rank test (non-parametric statistic) to assess change Social Skill Inventory score between before-after the intervention and score between before intervention and follow up score. Besides, researcher used qualitative data by utilizing open questionnaire to obtained feedback from participants.

Table 2. Social Skill Score

Participant	Pre Test	Post Test	Follow Up
NCP	231	262	265
SL	222	222	228
AM	216	228	231
MRU	233	247	257
KR	223	224	232
ER	210	213	238
RAM	240	240	242
Mean	225.00	233.71	241.85

Table 3. Statistical Analysis

N	7
Chi-square	13.231
df	2
Asymp. Sig.	.001*

*p < 0.05

A total seven participants took part in the study had a mean age 17,7 years old, consists of two males and five females. They completed pre-test, post-test, follow-up and feedback forms. According to statistical analysis, suggest that there was significant score of social skills between pre-test, post-test and follow up phase. This indicated by a Sig. level of 0.01. Comparing the mean, there was increase in social skills over time.

Table 4. Qualitative Evaluation

No	Participation	Pre Test Motivation	Follow-up Feedback
1	ER	She wants to be more open because her introvert and not always open to others, except with people she has known for a long time. She know that Universitas Indonesia demand their students to be more active, so she think that this intervention will be useful	She can talk more and brave to speak up to public, although she felt nervous earlier.
2	KR	She wants to know how to build a good social relation with the others student in Universitas Indonesia	She found that it's easier to speak in front of public, more appreciate the people who talk to her, braver to try something new, and braver to speak up her opinion.
3	MRU	He wants to eliminate the social anxiety that he often experiences when facing new people, especially in campus environment	He is braver to join committees that involve a lot of people, braver to acquainted with a lot of people, begin to talk better as taught in the training, and understand other's feeling when talk to them. He currently is still trying to apply the ABCDE concept in daily basis.
4	AM	She wants to increase her social skill in order to get a lot of social relation.	She is now having more friends, more understanding and could handle other people, more confident.

5	SL	She feels annoyed by her minimum social skill.	She could understand herself more and realize that the improvement of social skill requires time and process.
6	NCP	She wants to increase his confidence, eliminate his 'anti-social' trait of her.	She experiences more activities, having fun with friends, less minding about other people thinking about her.
7	RAM	He wants to make the social skill as an assets in facing university life.	He could think more positively and he feels that this training helps him socialize in campus environment.

Based on the qualitative analysis results, found that all the participants get the positive improvement of social skill after joining this intervention. At first, they were interested to join this intervention because they mostly felt that their skills to socialize with other people are low. Some of them felt that they have traits that inhibit them from performing good social skill such as: behaving less openly to other people, feeling antisocial, and feeling having social anxiety when they are with other people. One month and a half after finishing this intervention, participants experience positive outcome in their social skill, such as: braver to speak in front of public, feeling more comfortable to build social relation, and more understanding of themselves and others.

The aim of this study is to analyzing the application of social skill training to increase college freshmen's social skill. The hypothesis was social skill of Universitas Indonesia's freshmen student can improve through social skill training. This research showed that, there was change of score between pre-test, post-test and follow-up measurement.

The main factor in this study is experiential learning as a principle in this training which is very effective to improve their social skill. Participants on this study are actively involved so they could gain their concrete experience, make a reflection and conclude their reflection according the concept (Lewin, as cited in Kolb, 1984; Supratiknya, 2009). Facilitator as a mediator helps participants to discuss and carry out their experiences related to social skills. This is also supported by the high commitment of participants during the training. Besides, participants could learn from the others experiences related to social skill.

The number of subjects only a few (seven participants) so that learning process can be created conducive and there were formed group dynamic. In this group, there were similar issues related every participants so that they become more open in expressing what has been felt so far.

Conclusion

This study proofs that the social skill training could improve social skill among the freshman students of Universitas Indonesia. This is based on the quantitative analysis result that shows increasing score of SSI during the pre-test,

post-test, and follow up sessions. However, this result didn't show that this intervention is proven applicable to larger population due to the few amounts of participants that included (seven peoples in total).

Meanwhile based on the qualitative analysis results, found that all the participants experiencing plenty benefits after joining this training. The social skill training helps them to become more open to other people, more understand themselves and others, and more comfortable in interacting with other people.

For further research, we suggest this design to be done again for having to make sure the effectiveness of social skill training in freshman students. A few numbers of this study's participants makes us suggest further research to be done by including larger numbers of participants as well as including control group instead of single experimental group. This aims to ensure that the changes in participant's social skill are due to this training conducted by researchers. This study also not including assessment before initiating the intervention and probing further feedback after the intervention is done. This could be done by using in-depth interview before and after the intervention is done.

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SECONDARY SCHOOL STUDENTS' CONSTRUCTION OF KNOWLEDGE: THE CASE OF FRACTIONS DIVISION

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Abstract
Fractions are well known to be difficult to learn, but it is should not be surprising considering the complexity of the concepts involved. In working with fractions, children learn new rules that often conflict with well-established ideas about whole numbers. Many studies have revealed that fractions division has been thought to be the most complex of the mathematical operations in elementary mathematics. However, fractions and the operations have been recognized as an important foundation for the understanding of our number system. Therefore, teachers should provide meaningful learning experiences that relate to division of fractions. This present study aimed to analyze secondary school students' construction of knowledge in fractions division. This descriptive study was conducted with 44 seventh grade students in Pangudi Luhur Junior High School in Yogyakarta, Indonesia. During a one-week unit of lesson on division of fractions, students were given a task-based activity specifically designed to promote students' understanding. Data sources in this study included observation of the learning process and a pre and posttest of students' conceptual knowledge and procedural computation skills. The result showed a significant improvement in students' conceptual knowledge and procedural knowledge.

Keywords: conceptual knowledge, division of fraction, procedural knowledge

Introduction

One of mathematics topics learned from elementary and continuing up to secondary school is fraction. Lortie-Forgues, Tian and Siegle (2015) argued that understanding of fractions plays an important role in learning the next mathematics concepts and fractions have many applications in everyday life. However, many research revealed some important issues about some challenges in teaching and learning fraction. The first issue is many students have great difficulty in understanding fraction (Ma, 1999 and Lortie-Forgues, Tian and Siegle, 2015). Furthermore, Fendel (1987 in Tirosh, 2000) and Ma (1999) revealed that division of fractions is considered to be the most difficult, the most mechanical and least understood topic in elementary mathematics. According to Ma (1999), the difficulty is not only the difficulties experienced by students in

learning the fractions, but also the difficulties experienced by teachers in teaching the concept of fractions.

The second issue is about the way of teaching and learning mathematics, especially in Indonesia. Mathematics in Indonesian curriculum tended to be taught in a very formal way; teachers explain the mathematics operation and procedures, give some examples, and ask students to do the other similar problems (Armanto, 2002). In learning fractions, students are taught algorithms with little attempt to ground them in a meaningful experience.

Because of the complexity of division of fraction concepts, more time should be allocated in the curriculum for developing students' understanding of fractions division. But just more time is not sufficient to improve understanding; the emphasis of instruction should also shift from the development of algorithms for performing operations on fractions to the development of a quantitative understanding of fractions divisions. Considering this fact, the teaching and learning need to focus on how understanding fractions division can be taught. This need leads to the third issue namely explorative activities. In Realistic Mathematics Education (RME), it is important to give students the opportunity to explore some daily life contexts in which mathematics play a role.

Theory

Realistic Mathematics Education (RME)

The philosophy of RME is mathematics as a human activity, which means that mathematics must be connected to reality, stay close to students and should be relevant to society (Gravemeijer, 1997). There are three main principles in the RME (Gravemeijer, 1997, Treffers, 1991, and Julie, 2014), namely:

Guided reinvention through progressive mathematizing

In realistic mathematics learning, students are given the opportunity to explore problems to experience a process similar to the process by which the mathematics was invented. Through solving a series of problem, students are expected to produce strategies evolved from informal to more formal procedures so that at the end a formal procedure can be found by students.

Didactical phenomenology

In RME, students explore phenomena or situation series that are meaningful for them. According to Freudenthal (1983, in Gravemeijer 1997), situations where a given mathematical topic is applied are to be investigated for two reasons. Firstly, to reveal the kind of application that have to be anticipated in instruction; secondly, to consider their suitability as points of impact for a process of progressive mathematization.

Self-developed models

In realistic mathematics learning, models are interpreted as mathematical representations of problems. Models are used, explored, and developed to bridge the difference in levels from concrete to formal levels. Therefore, the term model or symbol here is always associated with the process of mathematization.

Students' Knowledge of Division of Fractions

When studying division, students can gain a lot of new knowledge, for example students can learn about rational and irrational numbers, place value, the connections among the four basic operations, as well as about the limits and power of relating mathematics to the real world (Ball, 1990). However, in many textbooks, introduction to fractions division states simply "Dividing by fraction is the same as multiplying by its reciprocal". There is little or no attention given to the meaning of divisions with fractions and division with whole numbers (Ball, 1990). Therefore, many students are puzzled that the answer to a problem such as $\frac{1}{3} \div \frac{1}{6} = 2$ is bigger than the number they started with.

There are two common methods for division of fractions taught in elementary schools in many countries, namely common-denominator method and inversion method. Capps (1962) stated that textbooks in the past have favored the inversion method and the common-denominator method more often appears in meaningful teaching. Capps (1962) revealed that the inversion method of division of fractions reinforce students' skills in multiplication of fraction since the inversion method of fractions division requires multiplication as part of the computational procedures. In this research, the researchers facilitated students to give meaning to the inversion method so they really understand why in dividing by fraction is the same as multiplying by its reciprocal.

Tirosh (2000) explained that students' errors made in division of fractions can be categorized in three main categories:

Algorithmically based errors

These errors are made in the computational process when an algorithm is viewed as a meaningless series of steps. For example: $\frac{3}{4} \div \frac{1}{8} = \frac{4}{3} \times \frac{1}{8} = \frac{4}{24} = \frac{1}{6}$ These kinds of errors are usually explained as resulting from rote memorization of the algorithm.

Intuitively based errors

These errors result from misconceptions associated with division; students tend to overgeneralize properties of operations with natural numbers to fractions and to interpret division primarily using a primitive, partitive model of division.

Errors based on formal knowledge

These errors result from limited conceptions of the nature of fractions and inadequate knowledge related to properties of the operations. For example, students think that division is commutative and consequently argue that $\frac{1}{2} \div \frac{3}{4} = \frac{3}{4} \div \frac{1}{2}$

Method

This study was a descriptive study analyzing secondary school students' construction of knowledge in fractions division. The study was conducted with 44 seventh grade students in Pangudi Luhur Junior High School in Yogyakarta, Indonesia.

During a one-week unit of lesson on division of fractions, students were given a task-based activity specifically designed to promote students' understanding. Data sources in this study included observation of learning process and a pre and post-test of students' conceptual knowledge and procedural computation skills.

Findings and Discussion

The research results were divided into three sections. Those are students' initial knowledge of fractions division, the learning process of division of fractions, and students' knowledge about fraction division in the post test.

Students' initial knowledge of fractions division

Students' initial knowledge of fraction division is revealed through a pre-test. In the pre-test, students were given a contextual problem that requires them to translate the contextual problem into a mathematical sentence and apply the knowledge of fractions to solve the problem. The problem given is as follows:

Mrs Surya has 2 kg of flour and $1\frac{1}{4}$ kg of sugar.
She will make some cakes.
For each cake she makes, she needs $\frac{1}{2}$ kg of flour and $\frac{1}{4}$ kg of sugar.
How many cakes can be made by Mrs Surya?

Based on students' answer, it can be showed that there were only 16 (36%) students who were able to translate the problem into a mathematical sentence and there were only 10 of them who can give correct procedure of fractions operations. The students' answer also revealed that there were some students who gave an incorrect mathematical sentence and the others directly gave the final answer.

The following are the students' strategy to solve the problem:

- Students used repeated subtraction strategy

Flour (2 kg)
The first cake
$2 - \frac{1}{2} = \frac{2}{1} - \frac{1}{2} = \frac{4-1}{2} = \frac{3}{2}$ kg
The second cake
$\frac{3}{2} - \frac{1}{2} = \frac{3-1}{2} = \frac{2}{2} = 1$
The third cake
$1 - \frac{1}{2} = \frac{2-1}{2} = \frac{1}{2}$
The fourth cake
$\frac{1}{2} - \frac{1}{2} = 0$

Sugar ($1\frac{1}{4}$ kg)
The first cake
$1\frac{1}{4} - \frac{1}{4} = \frac{5}{4} - \frac{1}{4} = \frac{5-1}{4} = 1$ kg
The second cake
$1 - \frac{1}{4} = \frac{4-1}{4} = \frac{3}{4}$
The third cake
$\frac{3}{4} - \frac{1}{4} = \frac{3-1}{4} = \frac{2}{4}$
The fourth cake
$\frac{2}{4} - \frac{1}{4} = \frac{2-1}{4} = \frac{1}{4}$

Therefore, Mrs. Surya can make 4 cakes

Figure 1. Students' answer using repeated subtraction on the pre-test

Figure 1 shows that the students were able to translate the problem into mathematics symbol and they used repeated subtraction strategy to find how many cakes that can be made by Mrs Surya.

- Students used inversion method

Flour

$$2 \div \frac{1}{2} = 2 \times \frac{2}{1} = \frac{4}{1} = 4 \text{ (cakes)}$$

Sugar

$$2 \div \frac{1}{4} = \frac{5}{4} \times \frac{4}{1} = \frac{5}{1} = 5 \text{ (cakes)}$$

Therefore, Mrs. Surya can make 4 cakes

Figure 2. Students' answer using inversion method and having correct conclusion on the pre–test

Flour

$$2 \div \frac{1}{2} = 2 \times \frac{2}{1} = \frac{4}{1} = 4 \text{ (cakes)}$$

Sugar

$$2 \div \frac{1}{4} = \frac{5}{4} \times \frac{4}{1} = \frac{5}{1} = 5 \text{ (cakes)}$$

4 + 5 = 9

Therefore, Mrs. Surya can make 9 cakes

Figure 3. Students' answer using inversion method and having incorrect conclusion on the pre–test

Students were able to translate the problem into mathematic symbols and they used the inversion method to find the answer.

- Students were not able to translate the problem into mathematics symbol

Cake ingredients owned: $2 + 1\frac{1}{4} = 3\frac{1}{4}$

Cake ingredients needed: $\frac{1}{2} + \frac{1}{4} = \frac{2+1}{4} = \frac{3}{4}$

The number of cakes that can be made:

$$3\frac{1}{4} \div \frac{3}{4} = \frac{13}{4} \div \frac{3}{4} = \frac{13}{4} \times \frac{4}{3} = \frac{13}{3} = 4\frac{1}{3}$$

Therefore, Mrs. Surya can make 4 cakes.

Figure 4. Students' answer is having incorrect interpretation of the problem but having the correct inversion procedure on the pre-test.

The pre-test result showed that many students that can apply inversion method appropriately while dividing fractions, but some students who apply this method made mistakes in drawing conclusions. In addition, pre-test results showed that some students used informal strategy to solve the problems i.e. repeated subtraction strategy. The repeated subtraction strategy seems to be more meaningful for the students, as no student has made a mistake in drawing conclusions with this strategy.

The learning process of division of fractions

In facilitating students to understand the fractions division operation, the researchers designed some contextual problems in which the students can

construct the meaning of the fraction division operation through the problem solving process. As has been revealed in the pre-test, most of the students have mastered the inversion method when dividing fractions but they have difficulty in understanding the concept of fractions division and inversion method so that they have difficulty in applying that knowledge to solve contextual problems. The following is one of the contextual problems used in learning of fractions division.

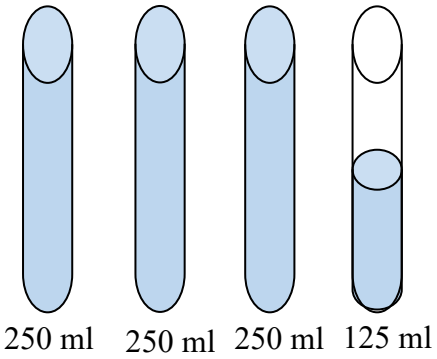
> Mother has a 1,5 litres drinking bottle. The bottle only contains three-quarters of the portion. Mom will pour the water into some 250 ml small bottles.
> a. How many small bottles can be filled with the water from a large bottle?
> b. How many part of the water in the bottle which is not fully charged?

The mathematical concept in the contextual problem is the concept of division operation. In solving the problem, students can use their knowledge of the division of integers, if they first convert the unit of volume to obtain integers. If students do not convert the unit of volume, they will work with decimals or fractions.

The following is the answer given by most of the students in the class:

> 1, 5 litre = 1500 ml (conversion of unit's volume)..
> 1500 ml ÷ 4 = 375 ml
> 375 ml x 3 = 1125 ml.
> 1125 ml ÷ 250 ml = 4 bottles and the rest is 125 ml

From the students' answer, the teacher asked the students to make an illustration of the answer. Here is the illustration given by the students:



From the illustration, the teacher led a discussion and so that the student can derive the conclusion that 125 ml is a half of 250 ml. From the discussion, the students can conclude that there are 4 bottles of 250 ml that can be fully filled with water and there is 1 bottle of 250 ml that is only filled one half. Furthermore, the teacher asked the students not to convert the unit so that the students must perform the division operation involving decimals or fractions i.e. $1{,}125 \div 0{,}25$ or $1\frac{1}{8} \div \frac{1}{4}$. With this kind of activities, the students are guided to give

meaning of the following operations $1\frac{1}{8} \div \frac{1}{4} = 4\frac{1}{2}$, and to make sense why when they divide by a number less than one, the quotient is larger than the dividend.
In the process of learning, teachers play a role in giving opportunities to students to express ideas, stimulate social interaction, build mathematical concepts contained in the contextual problems, and clarify opinions or answers given by students.

Students' knowledge about fractions division on the post test

After one-week unit of lesson, the students were given a post-test. The post-test contains a bare numbers problem that requires them to carry out a fractional division procedure and a contextual problem that requires them to translate the contextual problem into a mathematical sentence and apply the knowledge of fractions division to solve the problem. The problem given is as follows:

1) $\frac{5}{8} \div \frac{1}{4} = \ldots$

2) Yesterday Mrs. Ana bought $2\frac{3}{4}$ kg of rice.

Today, Bu Ana buys another $2\frac{1}{2}$ kg of rice.

a) How many kilograms of rice does Mrs Ana have?

b) If Bu Ana wants to share the rice to some of her neighbours who each need $\frac{3}{4}$ kg of rice, how many neighbours get the rice?

Based on the students' answer in solving bare numbers problem, there were 37 students (84%) who were able to use inversion method in dividing fractions but 4 of them were not able to derive the correct final answer because they made mistakes in multiplying and simplifying fractions.
The following are the students' strategies used to solve the bare numbers problem:

- Students used inversion method and got the correct final answer

There were 33 students who were able to use inversion method correctly in fractions division.

$$\frac{5}{8} \div \frac{1}{4} = \frac{5}{8} \times \frac{4}{1} = \frac{20}{8} = 2\frac{1}{2}$$

Figure 5. Students' answer using inversion method correctly on the post-test

- Students used inversion method but made errors in calculations

$$\frac{5}{8} \div \frac{1}{4} = \frac{5}{8} \times \frac{4}{1} = \frac{32}{8} \times \frac{5}{8} = \frac{310}{8} = \frac{31}{80}$$

Figure 6. Students' errors on the post-test in multiplying and simplifying fractions

Students' answer on the post-test shown in figure 6, 7, 8 reveal that many students made algorithmically based errors in addition to errors in technical calculations e.g. errors in the division of integers. Their answers show that the

algorithm in dividing or multiplying fractions is viewed as a meaningless series of steps.

$$\frac{5}{8} \div \frac{1}{4} = \frac{5}{{}_{1}\cancel{8}} \times \frac{\cancel{4}^{2}}{1} = \frac{10}{1}$$

Figure 7. Students' errors on the post-test in simplifying fractions multiplication

Furthermore, based on the students' answer in solving the contextual problem, 39 students (89%) were able to translate the problem into mathematical sentence, only 30 out of them are able to derive the correct final answer. In this paper, the researchers only focus on question 2b, because this paper focus on students' comprehension in fractions division.

$$\frac{5}{8} \div \frac{1}{4} = \frac{5}{8} \times \frac{4}{1} = \frac{32}{5}$$

Figure 8. Students' errors on the post-test in multiplying fractions

The following are the students' strategies in solving a contextual problem:

- Students used inversion method correctly and derive the correct final answer

Figure 9. Students' answer using inversion method correctly and having the correct final answer on the post-test

The amount of rice owned by Mrs. Ana:

$$2\frac{3}{4} + 2\frac{1}{2} = 4\frac{3+2}{4} = 4\frac{5}{4} = 4 + 1\frac{1}{4} = 5\frac{1}{4}$$

The number of neighbors who get the rice:

$$5\frac{1}{4} \div \frac{3}{4} = \frac{21}{4} \div \frac{3}{4} = \frac{21}{\cancel{4}^{1}} \times \frac{\cancel{4}^{1}}{3} = \frac{21}{3} = 7$$

Therefore, there are 7 neighbors who get the rice

There were only 26 students (59%) who were able to use inversion method correctly and do the calculation correctly.

- Students used inversion method but made errors in calculation

The amount of rice owned by Mrs. Ana:

$$2\frac{3}{4} + 2\frac{1}{2} = 4\frac{4}{6}$$

The number of neighbors who get the rice:

$$4\frac{4}{6} \div \frac{3}{4} = 4\frac{6}{4} \times \frac{4}{3} = 4\frac{16}{18}$$

Figure 10. Students' errors on the post-test in adding fractions, in using inversion method, and in multiplying fractions

Figure 10 shows that these students made errors because they did not understand the concepts in fractions and its operations, for example in adding, multiplying, and dividing fractions. Therefore these errors can be categorized as

algorithmically based errors; these errors resulted from rote memorization of the algorithm.

- Students used repeated addition

The amount of rice owned by Mrs. Ana:

$$2\frac{3}{4}+2\frac{1}{2}=\frac{11}{4}+\frac{5}{2}=\frac{11+10}{4}=\frac{21}{4}=5\frac{1}{4}$$

The number of neighbors who get the rice:

1 neighbor: $\frac{3}{4}$ kg; 2 neighbors: $\frac{6}{4}$ kg; 3 neighbors: $\frac{9}{4}$ kg; 4 neighbor: $\frac{12}{4}$ kg;

5 neighbor: $\frac{15}{4}$ kg; 6 neighbors: $\frac{18}{4}$ kg; 7 neighbors: $\frac{21}{4}$ kg

Therefore, there are 7 neighbors who get the rice

Figure 11. Students' answer using repeated addition and having the correct final answer on the post-test

There are 2 students used repeated addition shown in Figure 11. This strategy seems to be more meaningful for them because they were able to get the conclusions correctly. However, this strategy is inefficiently used if the problem involves a relatively large number. This strategy also implies that the student's understanding might not have reached the formal level of understanding of the fractions division operation.

Conclusion

The students in this research were provided with the opportunities to develop an understanding of the concepts of fractions divisions in order to make sense algorithms of fractions division that they have learned in elementary school. The impact of this learning process can be seen from the results of the pre-test and post-test. The result of the pre-test showed that most of the students were not able to apply their knowledge of fractions in solving contextual problems, and also they made algorithmically based errors; errors resulted from rote memorization of procedures. The post-test showed a positive progress on students' understanding and skills in solving problems both problems that require procedural understanding as well as conceptual understanding although there are still some students who did not show a deep understanding of the concept of fractions division. This positive progress can be achieved due to the use of appropriate contextual problems in learning process that enable the students to solve the problems by linking the problem with their prior knowledge, and also because of the teacher's role that facilitates the discussion so that the students actively engage in making sense of procedures and the result of calculation using the procedures.

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BASIC TENSE PROBLEMS OF THE FIRST SEMESTER STUDENTS OF ENGLISH LANGUAGE EDUCATION STUDY PROGRAM

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Abstract
This paper investigated the problems of understanding basic or fundamental tenses in English grammar (the present tense, present continuous tense, present future tense, and present future continuous) that are faced by the first semester students of the English Language Education Study Program of Sanata Dharma University, Yogyakarta. Basic tenses in English grammar play a decisive role in various aspects related to learning English as the target language. Accordingly, it is essential to conduct a study on the issues of basic tenses in order to assist students to overcome their grammatical problems. Data were collected through questionnaires that were emailed to the participants. Results showed that the students had difficulties in producing or analyzing the present continuous tense, the present perfect tense and the present perfect continuous tense. The first semester students also faced difficulty in remembering the formula of each tense. The students admitted that they rarely reviewed the basic tenses regularly and they found it difficult to comprehend their grammar lessons well in the classroom.

Keyword: basic tense, English grammar, English learner, present tense

Introduction

In Indonesia, English is taught as a first foreign language (Lauder, 2008) and it is included in the Indonesian curriculum which states that the students should have English lessons in their school. Therefore, learning English in Indonesia is an obligation for the students in all levels, namely the Elementary School, Junior High School, and Senior High School (Lie, 2007). It might because that English is global language (Lauder, 2008) that is used by many people around the world to be able to communicate each other so that Indonesia Government of education include English as one of the compulsory subjects to be taught at schools. Moreover, there are many Indonesia universities that provide English as one of the study program within in both English department and non English department. Lie (2007, see Bram, 2016, p.58) said that the university students who do not take English-based study program, like the English Education or English Arts Study Program are given an English course "two hours per week" to improve their English skills, especially in speaking for good communication in English. It is to prepare the universities students to have good skills to communication in English

because nowadays, "English competence" is needed to get a good job and position in the workplace (Siregar, 2010).

Furthermore, in learning English, it is also an obligation for the students to learn also grammar or structure of English. It is because grammar is the fundamental in comprehending sentences in English. However, the students might face difficulties in learning and understanding English grammar because the students cannot keep away from their first language (see Sunarto, 2012, p. 187; Çakır, 2011) whereas, the patterns in English sentences are definitely different from sentences in Indonesian (Inayati & Damayanti, 2016). In this study, the writer will investigate the students' difficulties and what method(s) they suggest to get meaningful learning activities in learning English grammar.

English grammar is difficult to master, especially for students who learn English as a foreign language and the students may face difficulties in applying English grammar in both speaking and writing in English (Elturki, 2014). However, many students assumed that English grammar is an uninteresting course to learn by a using handbook (Vannestal & Linquist, 2007). It is still hard to motivate the students to learn English grammar even though there are many improvements in creating English grammar modules which it consists of activities for the students to have "peer discussion" and ability to solve problems in order to improve their knowledge of English grammar (Vannestal & Linquist, 2007; see Mestari, & Malabar, 2016, p. 125).

Learning English grammar is regarded as a way to increase the students' English skills and abilities to use it in a suitable and correct way (see Bram, 2014, p. 295 & Kurniasari, 2017). Indeed, the students will be easier to communicate in good English if they master English grammar. It cannot be denied that the students need to have good, accurate and meaningful English grammar to be able to have good communication in both spoken and written (Mestari, 2016). Furthermore, learning English grammar is also to prepare the students to have ability in reading English text in university level, especially for those who take the English Language Study Program where all of the texts given are in English (Lie, 2007).

Hence, the English grammar teachers should have meaningful plan in teaching. The English grammar learning activities should be interesting and enjoyable so that the students will be encouraged to explore their "innovation and creativity" in creating meaningful way of learning English grammar (Buditama, 2017). Therefore, it is needed for the teachers to provide authentic materials in the teaching learning activities because it is useful and helpful for the students to connect their own learning experiences to the language used by the native speaker of English (Burgess & Etherington, 2002; Mestari, 2016). By those authentic materials given the teachers, the students will be able to recognize and understand the English grammar in the "real language use" (Mestari & Malabar, 2016). Moreover, student-centered is one of effective approaches in understanding basic English grammar (Buditama, 2017). Giving many exercises for the students is needed in order to lead the students to have good memory and understanding on English grammar patterns (Burgess & Etherington, 2002; Mestari, 2016). As we know, teaching English grammar is "to give some rules" in English and its

"exceptions" (Çakır, 2011). However, drilling in teaching English grammar is effective so far in order to improve students' grammatical problems in using correct verb within the sentences and differentiating the time in each tense (Nawaz, et al., 2015). Moreover, it also can increase the students writing skills in English. However, the teachers should provide teaching learning activities which are appropriate for both the students' needs and level and also the aims of the course (Mestari & Malabar, 2016).

Method

This study was qualitative research, aiming to collect the data as much and detailed as they can (Sandelowski, 2000). Moreover, Ary, Jacobs, Sorensen, and Walker (2013, pp. 25-27) said that in qualitative research, the current writers presented narrative description and interpretation as the results of data analysis in rich and comprehensive detail. Furthermore, this study was a questionnaire-based study. The writers distributed the questionnaire to the participants via email because this channel was considered effective and efficient. The writers then emailed the questionnaire to the participants and asked the participants to send back the complete version which had been filled by them to the writer.

There were 27 participants of this study and they were chosen randomly. All of them were the first semester students in the English Language Education Study Program, Sanata Dharma University (SDU) Yogyakarta, Indonesia. Nonetheless, the writers believed that the number of the participants sufficed since their responses were considered as the representation of the students' problem and suggestion in learning basic tenses of English Grammar. Furthermore, the participants who were involved in this study were those who had ever learned basic English grammar in both Senior High School and university in the beginning semester. Then, to interact with them in order to get information for this study, the writer contacted them via email because it was an efficient way as what was explained in the previous subsection.

The writers used questionnaires to gain the data. In the questionnaires, the writers created two parts of the questions. The first part was to estimate the students' understanding in analyzing basic tenses of English grammar within some sentences and the degree of difficulty for each sentence based on their understanding. Then, the writer put a table to make it easy for the participants to answer the questions (analyzing the sentences). In the table, the writer provided some sentences to be analyzed by the students, alphabets [A = Present Tense (PT), B = Present Perfect Tense (PPT), C = Present Continuous Tense (PCT), D = Present Perfect Continuous Tense (PPCT)] as the participants' answer based on their understanding and analysis on the provided sentences and numbers (1 = very easy, 2 = easy, 3 = difficult, 4 = very difficult) as the participants' assumption of the difficulty level of those sentences. The writer also provided the example of how to fill the column of the table as the guidance for the students.

Furthermore, the second part was two open-ended questions which allowed the students to elaborate their problem(s) in learning English and their suggestion(s) for the lecturer in creating suitable method(s) in teaching basic English grammar. According to McDonough and McDonough (1997, p. 176),

open-ended questions may allow the participants to give the detailed information and their point of view about some issue and it is about statements and asks for degrees of agreement. It means that here, the students were able to extend their opinions freely related to the issue in that questionnaire.

Findings and Discussion

In this sub section, the writers presented the findings gained from the study undertaken. The first part in the questionnaire was to measure the students' understanding about the four basic tenses of English grammar within several sentences. Here, the students' were asked also to give their perception on the difficulty level in learning basic tenses and elaborated it in the first open-ended question in the second part. Thus, table 4.1 showed the students' perception on difficulty level of basic tenses.

Table 4.1 Students' Perception on Difficulty Level of Learning Basic Tenses

No	Basic Tenses	Level			
		1	2	3	4
1	Present Tense	44%	33%	19%	4%
2	Present Continuous Tense	29.63%	37.04%	29.63%	4%
3	Present Perfect Tense	4%	15%	44%	37%
4	Present Perfect Continuous Tense	7%	4%	37%	52%

Based on the findings of the first part and the first open-ended question in the questionnaire, it could be summarized that the students in the beginning semester had difficulties in understanding the basic tenses of English grammar. As shown in Table 4.1, there were 44% of students who stated that Present Tense (PT) was easiest tense to be understood. Then, 37% of students assumed that the Present Continuous Tense (PCT) was still easy to be understood but sometimes they faced difficulty to make or to analyze the sentence of PCT. However, the students said the two tenses, PT and PCT, had ever been learned in Senior High School (SHS). So, when they got the materials about those two tenses in the beginning semester, they did not face serious problems in learning PT and PCT. Although sometimes, they had confusion in differentiating between the two sentences because some of the students assumed that at a glance, those two tenses looked similar. Meanwhile, 44% of the students regarded that the Present Perfect Tense (PPT) was difficult but more than fifty percent (52%) students assumed that the Present Perfect Continuous Tense (PPCT) was the most difficult tense compared with the other three. The students considered that it was very complicated to make sentences by using PPT and PPCT.

Furthermore, the writers had classified the students' difficulties in learning basic tenses of English grammar into several main problems. The first was that the student faced difficulty in remembering the formula of each tense. They admitted that they did not have habit to learn basic tenses of English grammar. Hence, it was easy for them to forget the formula of the tenses so in their learning, they faced difficulty in using those tenses. Then, the second was that the students could not accept the lecturer's explanation in the classroom well. They assumed that all

this time, the lecturer's approach in teaching basic tenses especially was uninteresting and they did not have enough exercises to sharpen their understanding. Moreover, the students stated that it was complicated to decide the verb used in the sentence of PPT and PPCT whether it was a base form (V1), past simple (V2), or part participle (V3). In addition, the students mentioned another problem in applying *has been*/*have been* in the sentence of PPCT, when it should be *has been* and when it should be *have been*. These two tenses (PPT and PPCT) were the most complicated tenses for them.

However, in the second part of the questionnaire, the students elaborated their suggestions of method to learn basic tenses of English grammar. It was aimed for the lecturers, especially those who teach English grammar in the beginning or first semester. There were three main suggestions from the students. The first was that the students needed to have more exercises in making or analyzing sentences for each tense. Thus, it was needed for the lecturers to give them more exercises. So, they would be able to behave themselves to learn English grammar frequently so that they would remember the formulas of the tenses and later on, they would master English grammar, especially Basic tenses. Additionally, the students needed clearer explanations about the tenses because sometimes, it was difficult to determine and differentiate the time and verbs in each tense. Hence, the lecturers should have different approaches or methods which were more interesting, like providing games as one of tools to give examples or exercises for the students. Analyzing tenses within songs or stories were also suggested by the students because those were more interesting for them rather than sitting and listening to the lecturer's explanation in the classroom.

Conclusion

Indeed, learning basic tenses of English grammar is important because it is one of the fundamentals to have good communication in English. However, in the process, the students may face difficulties in understanding English grammar, especially Basic Tenses which have complicated patterns. Most of students who involved in this study assume that Present Perfect Continuous Tense is the most difficult and complicated tense to be learned. However, for other tenses, the students also mention their difficulties in analyzing and differentiating the time and verb used within the tense. It is a challenge for the English grammar teachers to pay attention in conducting or creating teaching learning activities which are meaningful and effective in learning English grammar. Meanwhile, the students suggest that the teachers should give English grammar materials by using interesting and enjoyable way, like providing games and authentic materials. However, having many exercises is also recommended for the students in order to strengthen their knowledge and understanding on English grammar.

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MATHEMATICS CLASSROOM ACTIVITIES BASED ON SOME TOPICS IN GRAPH THEORY TO DEVELOP CRITICAL THINKING OF PRIMARY AND SECONDARY SCHOOL STUDENTS

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Abstract
In Indonesia, graph theory is not part of Mathematics primary or secondary school Curriculum. Most students learn graph theory in university, especially those who takes major in Mathematics or Computer Science. This paper is a theoretical study in Mathematics Education which proposes some Mathematics classroom activities based on some concepts in graph theory to develop critical thinking for high school students as well as grade school. Some concepts in graph theory, such as vertex coloring and domination set can be used in primary and secondary schools to develop critical thinking of the students. These activities should be fun for the students since teacher may use it as a game in the class room.

Keywords: critical thinking, classroom activities, domination set, vertex coloring

Introduction

In Indonesia, graph theory is not part of grade school and high school curriculum (Depdiknas, 2016). In the United State of America, as part as her masteral research, Smithers (2005) discovered that a small amount of graph theory is taught as part as Discrete Mathematics with Statistics and Probability. But some high schools, according to Smithers, does not offer graph theory because they do not have enough manpower, or do not have enough time and rooms for an elective math course. Whether graph theory has been taught in school or not, still we can use some concepts in graph theory as classroom activities to improve their critical thinking capability. We do not need to spend too much time to teach graph theory to them, which will add some confusion to the students. It is possible, by giving some prior simple instruction for the activity, to ask the primary or secondary school student to do some activities based on some concept in graph theory without they know that they are solving a problem in graph theory. Thus, although, in Indonesia graph theory is not part of primary and secondary school curriculum, we may use some topics in graph theory, such as eulerian graph, spanning tree, vertex coloring, or domination, as a classroom activities to enhance critical thinking of the student.

School is not a place for transferring knowledge only. Of course, such of transfer information is happening in school, but school should go further by developing other capabilities needed by the student in the future. Aside of reading, analyzing, leadership or social capabilities, critical thinking capability should also be developed in school, through various school activities, especially classroom activies.

According to the recent guideline from the department of education of Republic Indonesia (Depdiknas, 2016), one of a competence that should be achieved through Mathematics in classroom is a critical attitude through student's learning experience. This paper proposes some classroom activities based on some topics in graph theory that can be used to achieve that objective, even though graph theory is not being taught in grade and middle school. The most important for the student is to practice how to think critically, using any information possible to solve the problem.

In this paper, we first discuss some ideas about critical thinking. Then we will review some basic concepts in graph theory needed in the classroom activity. The main discussion in this paper is some concrete classroom activity based on some concepts in graph theory, such as eulerian graph, spanning tree, vertex coloring, and domination.

Critical thinking is an important tool to solve daily life problems. Most of real life problems are complex and so it needs particular capability to solve it. To solve a problem, first we need to do a preliminary observation in order to get some information needed. Then, having some useful information, we need to choose a tool that can be used to solve the problem. Sometimes, we must go through several trial and errors to get a right tool to approach the problem. One of a capability needed for this kind of process is critical thinking.

In this paper, we use a definition of critical thinking stated by Florea and Hurjui (2015). They said that "Critical thinking is a way of approaching and solving problems based on arguments persuasive, logical and rational, which involves verifying, evaluating and choosing the right answer to a given task and reasoned rejection of other alternatives solutions." (Florea and Hurjui, 2015). Following the definition of critical thinking, Mathematics can be used to develop the critical thinking capability among the student. Of course, Mathematics is not the only subjects that can help students to foster their critical thinking capability. In Mathematics, the students are trained to solve problems using mathematical concepts they just learned.

Some researcher, such as Chukwuyenum (2013) and Dinuță (2015), studied the relation of critical thinking and mathematics in school. Chukwuyenum says that "critical thinking skills was also an effective means of enhancing students' understanding of Mathematics concepts." (Chukwuyenum, 2013). Furthermore, he recommends that an institution who trains secondary school Mathematics teachers should include critical thinking in their curriculum. This will improve students' performance in Mathematics. Dinuță studied the need of critical thinking to grasp geometric concepts among the students. She says, "The development of critical thinking is achieved through learning, a reason why the teacher must find

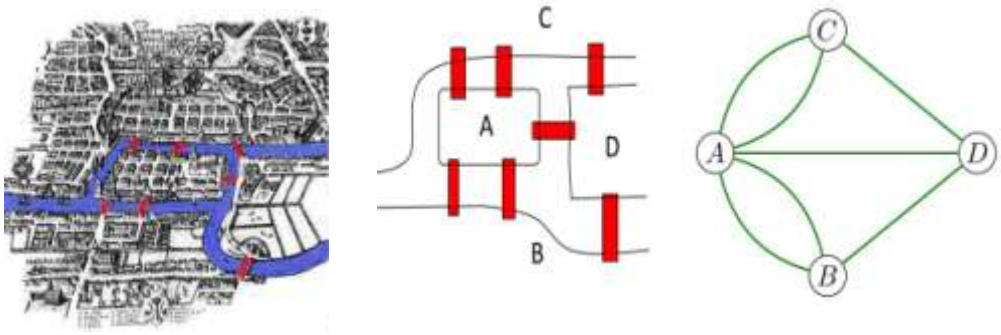
didactic methods and means to highlight each learning experience of each geometric concept." (Dinuță, 2015).

When she took a class on Graph Theory and Its Application, Smithers (2005) learned that graph theory should be taught for high school student so they may be exposed earlier to the beauty of this branch of Mathematics. She then proposed some topics in graph theory that can be taught to secondary school students.

Theory

Graph Theory

In this section, we will review some basic concepts in graph theory. The beginning of the graph theory can be traced back to the eighteenth century, when Euler (1707 – 1782), the father of graph theory, solved a famous problem called of Königsberg Bridge Problem (Harary, 1969:1). In Euler's time, the map of Königsberg city is shown in Fig. 1(a). We simplify the map and focus only to the river, lands, and bridges involved as shown in Fig. 1(b). Is it possible for us to begin at any of the four land areas, then we walk across each bridge exactly once and return to the starting point.



(a) (b) (c)

Figure 1. (a) A city map of Königsberg during Euler's time, (retrieved from http://www-history.mcs.st-andrews.ac.uk/Extras/Konigsberg.html), (b) its simplification, and (c) a graph that represents bridges connectivity in the city.

Euler showed that the problem is unsolvable. In his proof, he replaced each land area by a point and each bridge by a line joining the corresponding points. Thus we have a "graph" as shown in Fig. 1(c). Euler believes that the problem is geometric, but this kind of geometry is not the kind as known in his time which is geometry that involves measurements and calculations. He referred to a geometry which Leibniz said as Geometry of Position (Alexanderson, 2006).

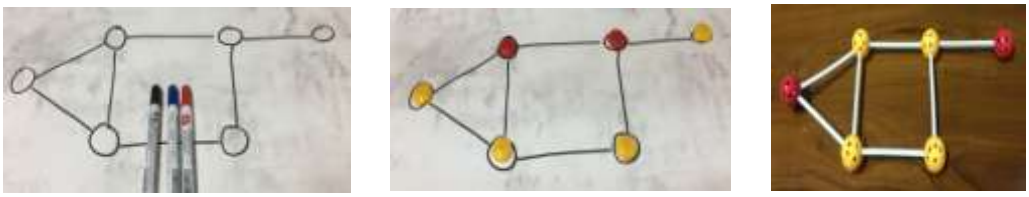
A graph consists of a (finite) nonempty set of vertices (or nodes), and a set of edges. Each edge has either one or two vertices associated with it, called its endpoints. An edge is said to connect its endpoints. The number of vertices, the cardinality of is called the order of and is denoted by. The cardinality of is called the size of. A graph in which each edge connects two different vertices and where no two edges connect the same pair of vertices is called a simple graph. Two vertices and are called adjacent (or neighbors) in if and are endpoints of an edge of. Such an edge is called incident with the vertices and is said to connect

and. In this paper, we only discuss connected undirected graph, which is a graph with undirected edge(s) and each vertex has a neighbor. The degree of a vertex is the number of edges incident with it. The degree of the vertex is denoted by. For other terminologies and concept not discussed in this paper, one may refer to Harary (1969) and Chartrand & Lesniak (2004).

Theory Application

Before we discuss some topics in graph theory that can be used as a class activity, we first discuss some materials we may use in the classroom. Classroom activity based on graph theory does not need an expensive material. The activity only needs material for the students to draw small circles and lines. We may begin with materials are available in any classroom, which are black board and chalk, white board and marker, paper and pencil, or colored pencil and paper. As shown in Fig. 2(a), we draw small circles representing vertices and lines representing edges of a given graph. We can make our graph more attractive using a magnetic white board and colored magnet to represent vertices (Fig. 2(b)). If available, we can use small colored balls and sticks to represent vertices and edges as shown in Fig. 2(c). Basically, we may use anything that can represent vertices and edges.

In our activity, we do not have to explain explicitly concepts in graph theory. We just need to explain, using a simple language, the rule used in the activity. For most activities in this paper, the students are only required to know concept of neighborhood. The following are some concepts in graph theory that can be adopted as a class activity for grade or middle school students. For grade school students, we should choose a graph with only few vertices and edges.

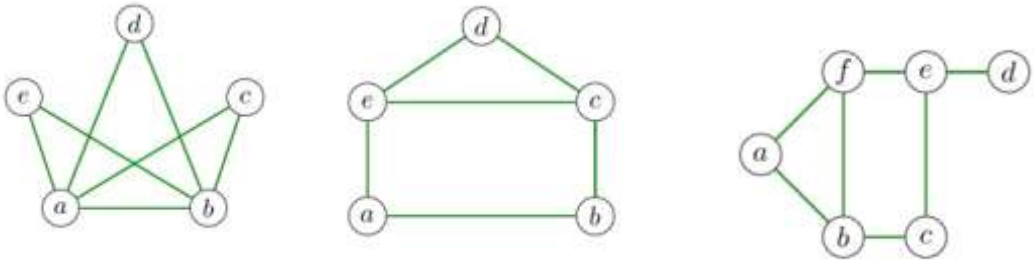


(a) (b) (c)

Figure 2. Some materials that can be used to represent a graph.

Eulerian Graphs

A walk of a graph is an alternating sequence of vertices and edges, beginning with vertex and ending with vertex, in which an edge connects the two vertices and for each. The number (the number of occurrences of edges) is called the length of. A walk is closed or open depending on whether or. A trail is a walk in which no edge is repeated. A graph is called eulerian if it has a closed eulerian trail, which is a walk that traverses each edge exactly once, goes through all vertices, and ends at the starting vertex. This concept adopts the Königsberg Bridge Problem which settled by Euler. Fig. 3(a) is an example of a eulerian graph.



(a) (b) (c)

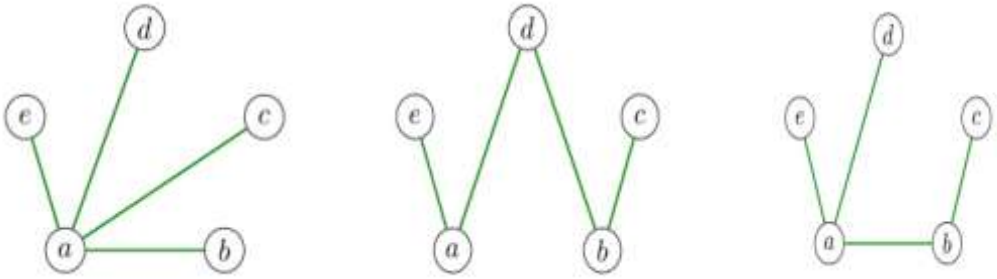
Figure 3**.** (a) A eulerian graph, (b) a graph contains a eulerian trail, and (c) a noneulerian graph.

We may use this concept in graph theory for a classroom activity. Given a graph, we ask the student to draw a similar graph without taking a pen from the paper and without retracing the same edge, begin and end at the same vertex. If the student can do that, then a given graph is a eulerian graph. Different graphs can be given to the student during the activity. For high school students, we may ask the student to observe what property is needed so that a graph is eulerian.

We can modify our classroom activity to observe some graphs which are not eulerian, but they contain a eulerian open trail. In other words, we may draw a graph that contain a eulerian open trail without taking a pen from the paper and without retracing the same edge, but it does not require begin and end at the same vertex. Fig. 3(b) is an example of a graph that has a eulerian trail. If possible, we also may ask the student to observe what property of graph that contains a eulerian trail. Fig. 3(c) shows a graph which is both not a eulirean graph and does not contain eulerian open trail.

Spanning tree

An acyclic graph is a graph that has no closed trails. All graphs in Fig. 3 are cyclic because all of them has a closed trails. A tree is an acyclic connected graph. A spanning tree of a graph is a spanning subgraph of that is a tree.



(a) (b) (c)

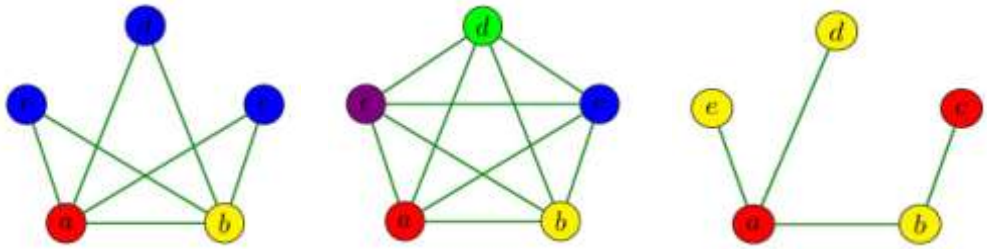
Figure 4. Three different spanning trees of a graph given in Fig. 3(a).

We first observe that for a given graph. It may have more than one different spanning trees. Fig. 4(a), Fig. 4(b), and Fig. 4(c) are three different spanning trees

of the graph given in Fig. 3(a). Thus in our classroom activity, we may ask the student to observe all possible spanning trees for a given graph.

Vertex Coloring

A coloring of a graph is an assignment of colors to its vertices so that no two adjacent vertices have the same color (Harary, 1969: 126). An -coloring of a graph is a coloring of using colors. The chromatic number is defined as the minimum for which has an -coloring. The chromatic number for graphs shown in Fig. 5(a), Fig. 5(b), and Fig. 5(c) are, consecutively, 2, 3, and 5. In our classroom activity, we may ask student to find all possible coloring for a given graph. Then, for some advance student, we may ask chromatic number for a given graph.



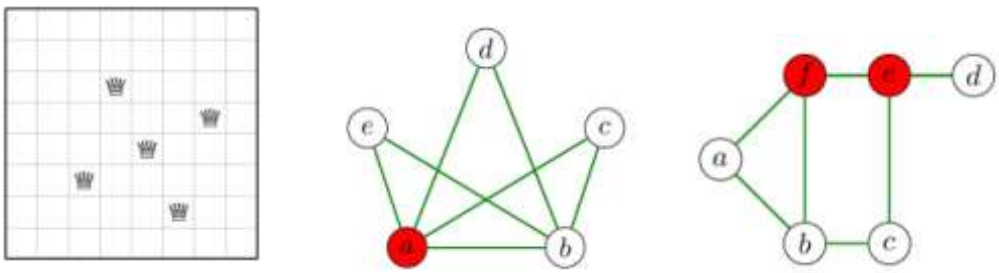
(a) (b) (c)

Figure 5. Three different graphs with their coloring.

Domination

The study of dominating sets in graph theory arose from a chessboard problem called the Five Queens Problem (Chartrand & Lesniak, 2004: 274). In the 1850's, chess enthusiasts in Europe considered the problem of determining the minimum number of queens that can be placed on a chessboard so that all squares are either attacked by a queen or are occupied by a queen. It was correctly thought that five is the minimum number of queens that can dominate all of the squares of a chessboard. One of possible configuration is shown in Fig. 6(a). This problem motivated the study of dominating set in graph theory, which was formalized mathematically by Berge in 1958 and Ore in 1962 (Chartrand & Lesniak, 2004: 274).

A vertex in a graph is said to dominate itself and each of its neighbors that is each vertex adjacent to. A set of vertices of is a dominating set of if every vertex of is dominated by at least one vertex of. Equivalently, a set of vertices of is a dominating set if every vertex in is adjacent to at least one vertex in. As an example, set and are dominating sets of graphs, respectively, shown in Fig. 6(b) and Fig. 6(c). The minimum cardinality among the dominating sets of is called the domination number of and is denoted by. As in previous activities, we may first ask student to find some dominating sets for a given graph, then for some advance student, we may ask them to find the domination number of the graph.



(a) (b) (c)

Figure 6. (a) A configuration of five queens on a 8×8 chessboard, (b) a graph with its domination number equals to one, and (c) a graph with its domination number equals to two.

Conclusion

This paper is a theoretical study that suggests classroom activities based on some concepts in graph theory. We believe that these activities will improve student's capability in critical thinking. Further experimental research is needed to know whether this classroom activity will help the student to improve their critical thinking.

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CONNECTING ENGLISH LANGUAGE TEACHING WITH 12 BRAIN/MIND LEARNING PRINCIPLES

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Abstract
On a daily basis, teachers all over the world modify their students' brain when they teach the contents that the students need to learn; this biological, cognitive and behavioral process is called learning. From a biological, cognitive and educational point of view, those modifications are totally necessary for the development of the learners. One of those so called brain-modification experiences occur when they learn English. Then, how could these modifications (learning) be enhanced? To answer this question, this paper suggests a connection between 12 brain/mind learning principles and English teaching aiming to make it more effective. The reason is that if teachers become aware of the way the brain learns, their practices may be enhanced leading to more effective teaching and learning. Thus, in order to state this connection, every principle is presented, described and followed by some general practical suggestions related to English teaching. It is necessary to mention that all the included suggestions are examples; it would be the task of the reader and of the teacher to ignite her creativity by applying the principles in her particular context to enhance her teaching practices and promote English learning among students.

Keywords: brain principles, English teaching, language learning, teaching

Introduction

Teachers, all over the world, employ a variety of methods and strategies every day. Some of them may rely on academically-grounded and mainly conventional ones, while others may use a mixture of the latter plus empirical ones based on their own and successful experiences. In any case, both will aim to promote effective teaching therefore effective learning. Effective language teaching, specifically English, has a strong background of fundamental methods and principles to guide its instruction (Brown, 2000; Celce-Murcia, 2001; Krashen, 1982; Richards & Renandya, 2002). All these theories and methods have proven to be effective in most contexts because they state general language learning principles. Most of those principles and theories are rooted on human psychological and cognitive skills needed to learn, in this very case, languages.

As mentioned earlier, teachers modify their students' brain every time they teach them something. As Tokuhama-Espinosa (2014) reflected "…by simply

sitting in a classroom…a student is bound to learn" (p. xxxii). She reached this conclusion when analyzing the effects of several teaching methodologies encased in the theory of visible learning (Hattie & Yates, 2014). In that way, all teaching may produce some kind of modification in the students' brain if we consider learning as a biological and cognitive change in our body. As Zull (2002) suggested, "learning is change. It is change in ourselves, because it is change in the brain. Thus, the art of teaching must be the art of changing the brain." (p. xiv). The idea of teachers as experts in the biology of teaching, therefore specialists in the way the brain learns has been supported by several experts in the area (Blakemore & Frith, 2005; Erlauer, 2003; Geake, 2009; Howard-Jones, 2014a; Jensen, 2008; Hattie & Yates, 2014; Rodriguez & Fitzpatrick, 2014; Tokuhama-Espinosa, 2014; Tokuhama-Espinosa, 2011; Willis, 2008; Zull, 2002; Zull, 2011).

In that way, it would be possible to think that the inclusion of updated general brain-based learning principles to support the existing foundations for teaching a language may lead to enhancements in any teaching situation. Thus, 12 brain/mind learning principles will be presented as an option to enhance English language teaching due to their connection with brain research.

Theory

The main theory underlying this study was derived from the 12 brain/mind learning principles proposed by researchers that believed that an understanding of the workings of the human brain may lead to effective teaching and learning (Caine, Caine, Klimek, & McClintic, 2009). They developed a list of 12 learning principles supported by brain research aiming to improve the way teaching is performed. Their efforts have been validated by studies related to cognitive neuroscience, specifically research conducted on one of its branches related to educational matters called; educational neuroscience or mind, brain and education.

All the studies performed in this area seek to support the science of learning and its applications in education (Blakemore & Frith, 2005; Erlauer, 2003; Geake, 2009; Howard-Jones, 2014a; Howard-Jones, 2014b; Immordino-Yang & Damasio, 2007; Jensen, 2008; Medina, 2008; Rodriguez & Fitzpatrick, 2014; Tokuhama-Espinosa, 2014; Tokuhama-Espinosa, 2011; Willis, 2008; Zull, 2002; Zull, 2011). It is necessary to mention that despite the efforts, contributions and findings that the experts in this area are making, they have also received criticism leading to interesting discussions on the effective connection between education and brain-science (Bruer, 1997; Bruer, 2016).

The 12 Brain/Mind Learning Principles

The foundation of the following analysis was mainly supported by the 12 learning principles, which as described by their authors are universal for all human beings (Caine, Caine, Klimek, & McClintic, 2009). Each principle aims to promote the inclusion of specific aspects critiical to learning. All those aspects are based on the workings of the brain when it undergoes any learning experience.

Moreover, apart from presenting the 12 principles, their authors arranged them within three distinct elements; relaxed alertness, immersion in complex experience and active processing. In this way, each principle fits one of the three elements which at the same time provide support for their effectiveness. These

three elements can be consider as fundamentals aspects of any teaching and learning process. At the same time, they mirror the general aspects found in the theories of how language teaching is supposed to be taught as well as how it has to be learned (Brown, 2000; Harmer, 2007a; Harmer, 2007b). The three elements and their corresponding 12 principles are presented in table 1. The order of the principles, within each element, is the same one their authors suggested.

Table 1. The 12 Brain/mind principles within each element

Relaxed Alertness	Immersion in Complex Experience	Active Processing
(11) Complex learning is enhanced by challenge and inhibited by threat	(6) The brain/mind processes parts and wholes simultaneously	(9) There are at least two approaches to memory: archiving isolated facts and skills or making sense of experience
(2) The brain/mind is social	(1) All learning is physiological	(7) Learning involves both focused attention and peripheral perception
(3) The search for meaning is innate	(4) The searching for meaning occurs through patterning	(8) Learning always involves conscious and unconscious processes
(5) Emotions are critical for patterning	(10) Learning is developmental	(12) Each brain is uniquely organized

Note. The 12 brain/mind learning principles are presented following the same order their authors proposed (Caine, Caine, Klimek, & McClintic, 2009).

The previous table described the principles based on the three elements, therefore the original order of the principles is presented in table 2 as follows.

Table 2. The 12 brain/mind learning principles.

Principle 1	All learning is physiological
Principle 2	The brain/mind is social
Principle 3	The searching for meaning is innate
Principle 4	The searching for meaning occurs through patterning
Principle 5	Emotions are critical for patterning
Principle 6	The brain/mind processes parts and wholes simultaneously
Principle 7	Learning involves both focused attention and peripheral perception
Principle 8	Learning always involves conscious and unconscious processes
Principle 9	There are at least two approaches to memory: archiving isolated facts and skills or making sense of experience
Principle 10	Learning is developmental
Principle 11	Complex learning is enhanced by challenge and inhibited by threat associated with helplesness
Principle 12	Each brain is uniquely organized

Note. The 12 brain/mind learning principles are presented following the same order their authors proposed (Caine, Caine, Klimek, & McClintic, 2009).

Theory Application

In order to connect English language teaching with the 12 principles, the following arrangement will be followed; the analysis will be presented firstly by stating a connection with each element followed by the reflections of their corresponding principles.

The First Element: Relaxed Alertness

Language teaching has been recognized by promoting the inclusion of strategies that pay attention to affective factors (Krashen, 1982). They play fundamental roles when learning. In that way, the principles under this element are definitely related to English language learning.

Principle 11. Complex learning is enhanced by challenge and inhibited by threat

Suggestions: Plan activities in which students use the language in a progressive and challenging manner. It means that they should feel that they improve in the process of learning. For example, when they finally acquire new vocabulary and they are able to use it, they will feel that they beat the content and they will want to know and learn what is next. The (i+1) hypothesis supports this idea (Krashen, 1982). This positive challenge experience will lead them to a feeling of achievement, which consequently may lower their affective filters in a language learning situation. Also, include activities in which the learners feel relaxed, calm, engaged and interested. For instance, include topics they really like, allow them to choose materials and let them be creative. Let them create their own dialogues, writings or choose their readings from a set of sources. All these ideas will allow them to enjoy the learning process by making them feel considered in the decisions of the class. All of them aim to keep their emotional states calmed and threat free.

Principle 2. The brain/mind is social

Suggestions: There is no doubt that human beings value socialization and rely on it to accomplish goals. If the aim of learning a language is to communicate then we need others to accomplish it. Plan activities in which learners are allowed to work in pairs and in groups. However, even though this practice is generally observed in language learning contexts, its inclusion is sometimes focused on some specific moments of the class. The suggestion then is to overuse socially-based learning activities. Instead of having a moment for socialization and interactive activities, it would be more beneficial to plan a whole session in which learners have the chance to interact while using the language. Similarly to the previous principle, let students use, play and discover features of the language with their peers. In the end, is it not the ultimate goal of language to share ideas with others?

Principle (3). The search for meaning is innate

Suggestions: Human beings are curious by nature. The need to understand and relate to what is happening around us is definitely a fundamental aspect of our lives. However, sometimes the learners may feel that what or how they learn is not useful. It is then the aim of the teacher to provide the reasons for learning, to let them know how certain activity or task will allow them to increase their knowledge and improve their skills. They need to be active actors in their own

learning process. They need to feel and also be aware of the benefits that a certain activity will provide them. Plan activities in which students need to discover, assess, think critically, feel engaged and reach a solution to a given problem. In doing so, it will be their curious nature that facilitates the memory formation leading to learning of the language.

Principle (5). Emotions are critical for patterning

Suggestions: This principle could explain itself without a reflection. It should be added that emotions are critical to all kind of learning, not only for patterning. Even though people can learn, by mainly memorizing something they do not like, this experience can become a long and strenuous process. The key element to learning comes from within the learners, it does not matter what the teacher does if the learner is not emotionally engaged, and therefore learning without an emotional connection may be impeded. It is then the job of the teacher to ignite those emotions inside the students. How? The previous principles already stated some ways to reach these emotional connections. All activities that will make the student feel interested, included, relaxed and curious will lower the affective filters of the brain. If you are teaching a class where students chose to be there, then you are one step ahead and it may be easier to manage this principle. However, in classes where language is mandatory for all, despite your interests, your aim is to find the ways to put all the benefits of the principles to promote, firstly, the interest of the learners, if you succeed at getting it, then you and your students are ready to go.

The Second Element: Immersion in Complex Experience

The emotionally and cognitively immersion in learning experiences facilitates the way learning is processed in the brain. Learners need to be active participants in the classroom, especially in language learning situations. In consequence, teachers need to pay attention to those activities that allow learners to be actively involved.

Principle (6). The brain/mind processes parts and wholes simultaneously

Suggestions: The nature of the workings of the brain and mind are inherently related. The way they both allow us to understand the world is critical. In that sense, the way they operate together and/or individually can be considered as fundamental parts of the way we perceive and experence reality. When we learn, we observe, assess and internalize the parts and the whole of the experiences we encounter. In the language classroom, teachers need to make sure that all learners understand the whole idea supporting the content they are learning as well as how its constituents parts interact to produce meaning. To be more specific, in english language learning, and from a gramatically point of view, the tenses have auxiliaries that allow words in sentences to obtain meaning related to time. Thus, students need to know how this parts will promote their accurate production of language in the correct tense to transmit the appropiate meaning in that specific timed-bound context.

Principle (6) All learning is physiological

Suggestions: When people learn, their whole body is receiving stimuli from the outside world. At the same time, their inner bodies are also experiencing several changes. It would be then possible to think that any effective learning

experience must guarantee the inclusion of the whole physiology. Plan activities that require learners to engage all their senses, be able to perform physical activities or games related to the contents. These ideas may lead to active learning experiences that will facilitate the body to receive several ways to identify, code and retain the stimulus being presented. The multiple asssociations that the senses and the physical experiences will permit to integrate the content from different perspectives. Use role-playing, acting and games that require movements to involve the whole body of the student in the learning process.

Principle (4). The searching for meaning occurs through patterning

Suggestions: In simple words, neurons in the brain work by creating connections called synapses. Most of the information we receive will be linked and storaged in that way, through connections. Plan lessons that allow students to connect what they know with the contents they will have to learn. Let and guide them to find patterns, similarities and differences in the topic they are learning as well as relate them with what they have already learned. Most teachers know the impact that previous knowledge in any learning experience has. Instead of presenting a new topic in isolation, you should relate it to the things they have already studied. Set this as the base for the new knowldege. The findings of patterns and relationships within the contents will enhance the way new memories are created because neurons that wire together fire together (Hebb, 1949). It means that patterning create connections that once reactivated will produce faster recalling of the iformation. The more connections created for one content may lead to better memorization and recalling.

Principle (10). Learning is developmental

Suggestions: Language teachers know that the language level of the students will direct and guide the planning of the lessons. The level and complexity of the contents must be related to the cognitive development of the learners which is strictly related to the level of english they have. If possible, group learners based on their performance, set standards of achievement for the class and include any type of differentiate instuction. This action, rather than aiming to create differences will aim to promote improvements in the class. Students will get promoted to the next stage once they reach the appropiate and required level. Take diagnostic tests to observe and make decisions according to the students level. Similarly, design different activities for each level within your own class.

The third Element 3: Active Processing

If students are in the classroom doing their assignments does not mean they are learning. There is a need for active processing of the information in order to reach effective learning. The process must be guided and provided by the teacher. This active processing is strictly related to memory formation, attention and metacognitive aspects of learning.

Principle (9). There are at least two approaches to memory: archiving isolated facts and skills or making sense of experience

Suggestion: This principle deals with the way in which memories are formed in the brain/mind. As mentioned earlier the brain works through connections. In that way, include in your teaching activities that allow learners to go beyond the simple rote memorization of vocabulary and grammatical into the inclusion of

different events to enhance remembering and memorization. The idea is to try mix the way the brain stores the information. Teachers should make the process of memorization fluid, comprehensive and dynamic aiming to provide students with opportunities to make sense of experience. The inclusion of experiencial learning in the way of using language in concrete and real world. Plan acitivities that bring the outside world to the classroom, go beyond the simple memorization of facts and allow students to use language as they would use it in daily conversations.

Principle (7). Learning involves both focused attention and peripheral perception

Suggestion: Attention is critical for learning, without it we cannot learn or at least the process will be more complicated. This principle is guided, by four main factors; interest, novelty, emotion and meaning (Caine, Caine, Klimek, & McClintic, 2009). Plan lessons that include them all. As mentioned earlier, learners' emotions and interest are fundamental. Moreover, take advantage of novelty. Start the lesson in a different way, do something unexpected, use your voice as an attention caller, gestures, music, feel free to be creative. If you gain their attention they will be ready to learn. In the language classroom, you can create situations in which students learn from the content and the context. There is a hidden attention system that also helps us to learn. We also learn without knowing. We assimilate information from the context eventhough we decide not to pay attention to an specific part of it.

Principle (8). Learning always involves conscious and unconscious processes

Suggestion: The keyword here is reflection. Most of the time we learn things conciously, some of them are taught while others are somehow absorbed by oursleves. Students' decisions to learn are bound to some of the things prevously described such as attention, affective factors and various mental processes that occur without being noticed. To some extent, the unconcious part of learning occurs when the learner is allowed to reflect and undergo metacognitive processes. This processes allow learners to internalize the contents. Provide students with some thinking time, allow them to reflect on what they have learned. Encourage them to think in the target language, to explain a partner the topics of the class. This may allow the memorization and the internalization of the contents. Moreover, it will also provide time for social learning. The 1-minute teacher is an easy to apply way to promote and use those self-reflections students did. The 1-minute teachers have the mission to tell a partner, in their own words, what they learned in the class and viceversa.

Principle (12). Each brain is uniquely organized

Suggestion: Every brain is individually shaped through experience. In that way, all learners may have unique and specialized preferences for learning. We are not refering to learning styles or multiple intelligences which have been considered as a neuromtyths due to the lack of scientific evidence to support them (Howard-Jones, 2014b). Take advantage of students' preferences by supporting their preferences, however with the same energy guide them to explore those ways of learning they believe are weak at. As mentioned earlier, challenge brings rewards, therefore if we can guide them to improve their weaknesses using their strong ways of learning they will feel satisfied. The concept of differentiated

instruction comes to play in this principle. Every learner is unique, in terms of level of language, previous experiences , skills and disposition to learn all this is influenced by affective factors. In that way, it would be advisable to include in your language classes alternative assessment to reach and respect all the differences among your students. Include choices, let students decide how they would like to be taught and assessed. If they feel important and included, their disposition to learn may be increased.

Conclusion

The three elements and their 12 brain/mind learning principles are observed in this analysis aim to promote general and equal ways of learning for all learners. It was then the first intention to propose a connection between them and English language teaching. The aim was to provide educators with 12 fundamentals aspects of how people learn. Secondly it aimed to show a way to how to add these ideas into English teaching. All the suggestions were mainly included as a way to add further explanation to each principle rather than presenting them as the only way to use the principles. As with any theory, method and strategy, it is the educator's mission to contextualize and add her own creativity to them. In education nothing is fixed, nothing is the perfect and ultimate solution to most educational problems. However, we also proposed, through the work supporting this analysis under the 12 principles (Caine, Caine, Klimek, & McClintic, 2009) that a higher understanding of the human brain may lead to higher opportunities for learning to occur, not only in the English language classes but in all of them.

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PROMOTING RESPONSIBILITY THROUGH THE MATHEMATICS CAPITA SELECTA COURSE WITH RECIPROCAL TEACHING STRATEGY BASED ON IGNATIAN PEDAGOGY

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Abstract
The purpose of this research is to describe the students' responsibility on the Mathematics Capita Selecta Course with Reciprocal Teaching Strategy based on Ignatian Pedagogy. The competence focus helps students to create an article in the Mathematical topics. The conscience focus is expected to help students hone responsible attitude. And the compassion focus is expected to appreciate diversity. Data analysis method used is descriptive qualitative-quantitative. The subjects are students who take the Mathematics Capita Selecta Course in the second semester of 2016-2017. In this course, lecturer use Reciprocal Teaching Strategy, where students in groups are given the task of discussing a mathematics article, presenting in class, and producing new articles. The results showed that the reciprocal teaching strategy helps students to increase their responsibilities. There is 6 groups can present their articles at the National Conference at Muhammadiyah University Purworejo. This strategy requires students to understand the selected articles and discuss in the classroom. In the aspect of responsibility is very high. On the student reflection, almost all students claimed to always strive to serve and be trustworthy when given responsibility, there is no need to force anything to remain their tasks.

Keywords: Ignatian Pedagogy, Mathematics Capita Selecta Course, Reciprocal Teaching Strategy, responsibility

Introduction
A student of Mathematics Education is prepared as a teacher and or a mathematician. As a teacher, they must have deeply knowledge of mathematics. As a mathematician, students must have a responsibility to develop the mathematical subject according with the times. The Mathematics Capita Selecta is an elective courses in mathematics education program. This course aims to help students to make a small research about latest topic in mathematics. In addition, this course will be very useful for broadening insights of mathematics. They can continue their small research into an undergraduate thesis or as a basic knowledge

to continue the master (S2). The students are expected to be able to review the articles of mathematics and then produce a simple articles on topics they like.

As an elective course, not all students will choose this course. Therefore, students who choose this course are expected to have an interest in mathematical studies and its application. Based on my experience on elective courses, the problem of students' understanding are caused by the lack of motivation. The lack of motivation causes the students to be less responsibility for their election course. Through the learning model based on Ignatian pedagogy, students are expected to be responsible for this course. Because this model not only prioritized the academic ability but also facilitates to develop the social ability. While the reciprocal teaching strategy is a cooperative learning that refers to students to work together in small groups and help each other in the learning process. Activity in this strategy is expected to promote the ability and attitude of student responsibility. Reciprocal teaching strategy makes the basic skills of effective reading comprehension visible to all (Cooper and Greive (2009), Pilten (2016)).

Combination of learning model based on Ignatian pedagogy and reciprocal teaching strategy needs to be implemented in this course. The focus of learning achievement based on Ignatian pedagogy includes competence, conscience, and compassion. The competence focus will help the students to complete the assignment in this course well. While in conscience will help students to develop their responsibility as a teacher or mathematician. The responsibilities are also intended attitude, diligence and seriousness of students to complete their assignment and course activities. In this paper, we will only discuss about the students‘responsibility in Mathematic Capita Selecta course.

Theory

Ignatian pedagogy

Ignatian pedagogy developed into a learning model that develops learners as a whole person. In practical terms, the application of Ignatian pedagogy is usually formulated in a system that has the main elements: context - experience - reflection - action - evaluation. Based on this cycle, a lecturer can assist the student to facilitate the process of learning and developing by gazing at the truth and exploring its human meaning. The basic framework of Ignatian pedagogy can described as follows:

1. Context: The context describes the readiness of students to grow and develop, campus and class environment, and lecturer.
2. Experience: There are two types of experience in learning, namely direct and indirect experience. The direct experience is the events that experienced by the students themselves both inside and outside the classroom. Indirect experience is the experience that students gain from hearing, reading, and looking through various media.
3. Reflection: Reflection is an important element in this model because it becomes the link between experience and action. Reflection is a process leading to personal change that can affect changes their surrounding environment. Reflection means making careful consideration using memory, understanding, imagination, and feelings concerning the field of knowledge learned. The purpose of the

reflection activity is to capture the value of the material learned, to find the interconnection between knowledge and between knowledge and reality, to understand the implications of knowledge and all responsibilities, and to form conscience.

4. Actions: Action is an activity that reflects inner growth based on experience that has been reflected. The action involves two steps, namely growing inner choices and expressing this choices. In the process of learning, action is to interpret the learning outcomes with the mind and heart to realize his knowledge in real life practice.

5. Evaluation: Education is expected to form a human personality intact, intellectually competent, willing to always grow, be religious, and full of love and determination to do justice in service to others. In Ignatian Pedagogy, the achievement of the goal is done by conducting a thorough evaluation on aspects of knowledge, attitude development, priority setting, and action. Evaluation is an activity to monitor the student progress. Evaluation is a systematic process of collecting, processing and deciding upon data about an object for subsequent consideration of assigning value to the object based on a certain criterion. The determination of whether an object is good or not good, pass or not pass, refers to a clear criterion. In the evaluation of learning, the object of assessment is the process and learning outcomes.

Reciprocal Teaching Strategy

Reciprocal teaching strategy is a cooperative learning step. This strategy invites students to work together in small groups and help each other in the learning process. There are four steps to doing this strategy:

a. Composing Questions: In this step, the student asks a question to himself. Steps are used to identify students' understanding of the material they have learned.

b. Predicting Answers: In this step, students connect their knowledge with information from reading and predict answers to questions that have been made by themselves.

c. Clarify: In this step, students clarify answers with reference to material provided by lecturer or other groups.

d. Summarization: In this step, students make summaries to distinguish between important and unimportant things. In addition, reading and evaluation activities are also required.

Method

The type of this research is qualitative-quantitative descriptive. The researcher will describe the results of research based on data obtained in quantitative and qualitative. The students' responsibility are described quantitatively and qualitatively based on the collected data. The subjects of this research are 6th semester student of Mathematics Education of Sanata Dharma University which chooses the Mathematic Capita Selecta course on 2nd semester of academic year 2016-2017. While the object of research is the attitude of responsibility in the Mathematic Capita Selecta course based on Ignatian Pedagogy with Reciprocal Teaching strategy.

The instrument that used in this study is an open questionnaire to explore the context and the responsibilities of students (prospective educators and scientists). Personal and friend's assessment sheets and observation sheets to collect data about the process of student responsibility. Assessment also uses student activity and reflection journals. These activities include discussion, searching for topics, seeking references, preparing proposals, solving problems in proposals, compiling articles and presenting in scientific forums. This data will be presented descriptively.

Findings and Discussion

At the first meeting, students write about all matters related to the student's decision to choose this course and their family background. Next, the students determine their group and select a mathematic article according to the rules that given at class and then present again in their papers and presentations. Students are given 2 weeks to complete their group assignment.

Based on the questionnaire, most of the students come from Java (82%) especially Yogyakarta. In addition, this class is dominated by students of class of 2014 (64%) and the rest of the students of class 2012 and 2013. This has an impact on their diversity both local origin, motivation, and academic ability. In general, the students choose this course because interested in this course, but also because of a best friend. Through this course, students hope to be easier to learn mathematic articles and find ideas in completing the undergraduate thesis later. During the lesson, students are very enthusiastic in dynamics. This is their first experience in selecting their own articles to be presented and discussing other group in the class.

Students work in groups, either independently or structured in the classroom. Experience starts from the second meeting. At the second meeting, students were asked to report the names of the groups and the titles of mathematic articles that discussed in presentations. In this meeting also determined the order of groups of presenters, discussers and moderators-notes. The meeting also clarified things that were not yet clear in completing the group task. This is also in accordance with the Reciprocal Teaching Strategy step, (1) the teacher explains to the students that in the first segment and acts as a model. Lecturer provide insights on the selection of Mathematics articles, extracting material from the article and the things that can be raised as a follow-up study. Lecturer also provide examples of articles that have been submitted by one of the groups for a brief review.

The second step of the Reciprocal Teaching Strategy is that students are asked to read the lesson material they have provided (in this case chosen by the group) and take the next step: predict the questions that might be asked by the lecturer and friends from other group, answer the questions, and class in the class. This preparation is done in the next meeting and is also done independently by students with discussion in the group.

The next step of the Reciprocal Teaching Strategy is to give students the opportunity to present their opinions or to ask questions when they uncover the less obvious and summarize the points in the subject matter provided. In this case, the lecturer may appoint one of the students to read the summary. Students are

trained to act as lecturer during lectures to encourage other students to participate in discussions.

In this lesson, students begin to present their papers. There are 4 groups that can present their group work. However, at the time of discussion and discussion, the process has not been dynamic and optimal. Some groups are still not confident at presenting, discussing or moderating. Other groups are also focused on their own papers.

At the next meeting, the students completed the revision of the paper. Furthermore, students make simple research proposals as the development of the articles they have presented. The proposal must be completed by the students into a new article to be presented at a national seminar. Lecturer provide assistance in making articles in groups. Articles made in accordance with previously proposed proposals. At this meeting, each group is given the opportunity to discuss in group and do question and answer with lecturer. The lecturer accompanied the group intensively and each group showed an attitude to quickly complete their task by questioning with the lecturer. Groups that have not had the opportunity to discuss with the lecturer, still enthusiastic to wait even until the end of the meeting still seemed the spirit to discuss.

Several groups were given the opportunity to practice the presentation because about 6 groups have been received to be presenters at the National Seminar on Mathematics and Mathematics Education at Muhammadiyah University of Purworejo on May 20, 2017. Each group presented their articles, others watched quietly and enthusiastically to give some input, whether related to the material or how the presentation.

In the final lecture held simultaneously held Internal Seminar of Mathematics. At the end of this meeting, the lecturer invited students to reflect on their seminary for a semester when they made an article and presented their study at the National and Internal Seminar. The reflection question is about: experience during this lesson about: (a) group formation, (b) selection of topics, (c) group work, (d) communicating the thoughts and results of discussions, (e) article creation; the real benefits gained by students and the real development of responsible attitudes; and tell related to: (a) things that support (exciting), (b) things that hinder (sad), (c) notes or input during this course.

Based on the student reflection, they say that: in the formation of groups, lecturer give the freedom to determine members of a maximum of 3 people. Most of the students said that forming groups based on the similarity of forces, based on class of class, and the closeness of friendship. There is also a heavy feeling because it is always in groups with one of his friends because all this time in their lectures are always in groups together. Some of the reasons that arise are to make it easier in determining the time to gather, facilitate communication and feel confident. In determining the topics to be studied in groups, there are groups that can define topics quickly and smoothly, but there are also groups that are time-consuming and time-consuming to determine the topic of group review. The freedom of choosing friends in this group may feel the discomfort in group work.

Students of this course admitted that they are always together in determining the theme of the article, doing the discussion and preparing the presentation. Each

contributes in his group according to their abilities. Among them are some who share roles by searching the literature, translating the selected articles, discussing and preparing presentations. In the presentation, they also share roles in presenting and answering questions from other groups and lecturer. There is a change in them that now does not always play HP during lectures, pay attention to the opinions of other friends and appreciate the differences of ideas and ideas. They also become more appreciative of the time for the tasks assigned during the lecture to be completed.

The most perceived benefit of students based on reflection writing is the group dynamics that contribute to each other's ways, can make other group members comfortable and work well together. Whatever the contribution, all have been given and give good results and should be grateful.

The development experienced by students is trying to serve and be trusted when given the responsibility. When you have a responsibility, there is no need to force things to remain trustworthy. Each student must be able to choose and accept any input or individual differences.

Supportive things are members who help each other and can work together. The sad thing is during the seminar. The reason, because it only presents to most of the friends of one class, so cannot convey to the crowd and do not get more input from outsiders.

Based on the observations made by the lecturer that every student will try to understand the material review of math article as possible. This is done either by discussing with friends or with lecturer. Even if the lecture time is over, the students are still discussing either by meeting the lecturer directly or through the WA group. It is possible to encourage students' comprehension skills to be more and data complete the whole task well.

Table 1. Achievement of Responsibility

Indicator	Score	Percentage	Category
Willingness to work together in groups	4.52	90.40%	Very high
Ability to work together in groups	4.25	85.00%	Very high
Willingness to complete the task	4.55	91.05%	Very high
Ability to complete the task	4.17	83.42%	Very high
Willingness to communicate with friends in groups	4.32	86.32%	Very high
Ability to communicate with friends in groups	4.14	82.89%	Very high

Based on the results of Table 1 above, it is known that for all indicators of responsibility attitude, classically can be categorized as very high. This is possible because of the demands that the group can present the results of the study at the National Seminar in order to obtain a better point. Each group strives to complete the assigned tasks as well as possible.

Conclusion

The conclusion of this research is that all the students who choose Mathematics Selecta Capita course have evaluation average of the responsibility

is very high category. In the aspect of competence, the students in their group are able to determine the topic of self-study, conduct group discussion, present study result, make proposal of study development, make article and present at National Seminar and Internal Seminar. In the compassion aspect, students are increasingly willing and able to complete their responsibilities both individually and in groups shown by indicators working together, completing tasks and communicating very high. So that as many as 6 groups can present their articles at the National Conference at Muhammadiyah University Purworejo.

This strategy requires students to understand the selected articles and discuss in the classroom. In the aspect of responsibility attitude including very high category. On the student reflection note, almost all students claimed to always strive to serve and be trustworthy when given responsibility. When you have a responsibility, there is no need to force things to remain trustworthy. Students are increasingly willing and able to complete their responsibilities both personally and in groups shown by indicators working together, completing tasks and communicating very high. So the this implementation can be said to be successful and useful for improving students' skills and graduation of students who choose this course and improve the attitude of responsibility.

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USING EXELSA MOODLE TO DEVELOP MATHEMATICS TEACHING SKILLS AND SPIRIT IN THE MICRO TEACHING COURSE

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Abstract
The purposes of the implementation of digital learning resources in the Micro Teaching Course are to (i) design and implement active and constructive learning dynamics to develop students' Ignatian Pedagogy-based teaching skills by utilizing Exelsa Moodle Learning Management System; (ii) produce teaching design and teaching videos that students can use to develop their teaching skills. In general, the implementation of learning is about 90% in accordance with the plan. The expected final achievement is generally achieved, namely that students have good skills in managing mathematics learning in the peer teaching (Competence), have high spirit in developing teaching ability (Conscience) and have high concern in helping their friends to develop their teaching skills (Compassion). The course design, explanations and materials are communicated optimally through Exelsa Moodle. Videos from short film projects can also be utilized properly. So far, the video recording of their teaching practice are treated merely as a collection. In fact, these videos can be utilized as examples and models to discuss teaching skills, in terms of material mastery, delivery or class management.

Keywords: Learning Management System, Ignatian Pedagogy, Micro Teaching Course

Introduction
As prospective teachers, Mathematics Education students should develop their teaching skills seriously. They should also be encouraged in teaching, considering they also have diverse motivations in responding to their vocation as teachers. They need to undergo training and mentoring to practice teaching with their friends in a small group. In order to do that, they need to take the Micro Teaching Course which integrates ICT in the teaching and learning activities by utilizing the Learning Management System at Sanata Dharma University, called Exelsa Moodle. The Learning Management System using Moodle is widely used in higher education institutions and gives very positive results. This can be seen in Raman, et.al., (2014), Mtebe (2015) and Rachel and Parthasarathy (2016).

The Micro Teaching Course is a compulsory course offered to students in semester 6. In semester 7, they practice teaching in school in PPL (Field Teaching Experience). This course provides opportunities for students to practice teaching their peers, monitored and guided by the Micro Teaching lecturers. In the previous semesters, the students have been equipped with courses that support this practice, such as Learning Psychology, Learning Methods, Lesson Plans and Learning Evaluations. In this Micro Teaching Course, they practice peer teaching in a Mathematics class and by giving each other support and suggestion for improvement.

This subject is very relevant as a vehicle to improve skills, foster spirit and concern for fellow students in learning to implement the learning process. Ignatian Pedagogy-based learning which focuses on aspects of competence, conscience and compassion (3C) is implemented. This course is believed to be able to assist students optimally in improving their skills (competence), the spirit of teaching (conscience) in an atmosphere full of concern for the development of teaching skills among the participants (compassion). The Ignatian Pedagogy Paradigm has also been applied in some college institutions and has given very satisfactory results. This can be seen in Foster (2012), Connor (2014), Vicki (2014) and Mauri, et al., (2015).

With Ignatian Pedagogy paradigm, learning is expected to be highly relevant and supportive of the vision and mission of the study program, whose vision is to be a venue for preparing candidates for professional humane Mathematics teachers. One of its missions is to prepare students to become Mathematics teacher candidates who have pedagogical, professional, personal, and social competence, and who empathize to the problems faced by learners and who appreciate plurality.

Therefore, in this course, the students will actively develop themselves to achieve the above competencies by joint learning activities in the Micro Teaching course passionately and whole-heartedly. In this semester, the Micro Teaching course will utilize the Exelsa Moodle Learning Management System to support communication, to display results and to facilitate class discussion, both between lecturer with students or student with student. Through the implementation of the learning management system in the Micro Teaching Course, students: (1) (Competence) have a qualified skill in managing mathematics learning in the scope of peer learning exercise; (2) (Conscience) have a high spirit in developing teaching skills; (3) (Compassion) have a high concern for fellow students to develop teaching skills.

The objectives of the implementation of learning with the development of Digital Learning Resources in the Micro Teaching Course are (1) to design and implement active and constructive learning dynamics to develop students'

teaching skills based on Ignatian Pedagogy by utilizing Exelsa Moodle Learning Management Systems; and (2) produce instructional designs and teaching videos that students can use to develop their teaching skills.

The benefits of the implementation of learning with the development of Digital Learning Resources in the Micro Teaching Course are (1) to provide guidance and tools in the dynamics of learning and teaching activities, i.e. the interaction patterns between lecturers and students and among the students to develop their teaching skills; And (2) produce micro teaching videos and knowledge that can be utilized to improve teaching skills.

Theory

This course employs various learning methods such as discussion, practice and discussion of feedback. The method of discussion in learning is a way of delivering instructional materials in which teachers provide opportunities for students or groups of students to hold scientific talks to collect opinions, draw conclusions or develop alternative solutions to problems (Aqil, 2007). Discussions are held in groups as well as class discussions facilitated by lecturers. Students discuss to prepare the scheduled teaching preparation with the lecturers and their peers. Direct practice is an educational experience involving children actively in the manipulation of objects to increase knowledge or experience (Haury & Rillero, 1994). Meinhard (Haury & Rillero, 1994) suggests that direct practice activity is the activity of using objects, in the form of living things and inanimate objects, which are available directly for research. The student will then practice from what he has designed before. During the practice, students will be observed by lecturers. From the observation then will be given feedback. Understanding feedback according to Eggen & Kauchak (1994) is the information provided by teachers to students about certain behaviors in order to improve students' performance.

Moodle is a course content management (CMS), first introduced by Martin Dougiamas, a computer science and teaching expert in Perth, Australia (https://docs.moodle.org/35/en/History). Moodle is an open source CMS that is currently used by universities, educational institutions, businesses and individual instructors who want to use web technology for the management of their courses. Moodle is currently used by over 2000 educational organizations around the world, including Sanata Dharma University with its Exelsa Moodle, to deliver online learning and as an enhancement to face-to-face learning.

In the design of lectures, Moodle will be used primarily as a learning management system to facilitate discussions between lecturers and students, as well as students and students, which can take place on-line outside of face-to-face meetings. In the Moodle web it is mentioned that the design and development of Moodle is guided by "social constructionist pedagogy", which is related to concepts: constructivism, constructivism, social constructivism, and connected

and separate (https://docs.moodle.org/24/en/Philosophy). From a constructivist point of view, people actively build new knowledge because they interact with their environment. We are not just passive memory banks that absorb information, or knowledge will "infect" us just by reading something or listening to someone. Constructionism asserts that learning is very effective when building something for others to experience. It can be anything from a spoken sentence or an internet post, to more complex artifacts such as paintings, houses or software packages. Social constructivism extends constructivism in social settings, in which groups construct knowledge of each other, collaboratively create small cultural artifacts along with shared meanings. Separate Behavior is when one tries to remain on 'purpose' and 'factual', and tends to defend their own ideas by using logic to find holes in the opponents of their ideas. Connected Behavior is a more empathic approach that accepts subjectivity, seeks to listen and ask questions in an attempt to understand other points of view. Built Behavior is when a person is sensitive to both of these approaches and is able to choose one of them that suits the current situation.

Method

The method used in this activity is the development method of teaching learning ability for prospective teachers. This lesson begins with an introduction to the principles of teaching skills and managing the classroom. Activities include the practice of teaching elementary mathematics, teaching junior high school materials, preparing teaching videos and teaching high school materials. The activity plan here also includes a draft guidance and tools in dynamics during lecture activities, supported by the Exelsa Moodle learning management system.

The implementation of the learning design will be recorded, analyzed and reported descriptively qualitatively, in terms of its implementation, the results of the student's work, evaluation and reflection. In general, the data are in the form of the practice of learning, observation result of the learning practice both from the lecturer and the students, self-evaluation of students' practice and students' reflection. In general, the data will be analyzed both quantitatively and qualitatively, in terms of the design of the practice, the results of the observation of the practice of assessment. In contrast, self-evaluation and students' reflection will be used as triangulation data. Quantitative data will be presented using descriptive statistics, while qualitative descriptive data will be analyzed by reducing, classifying in the topics, synthesizing and summarizing it.

Findings and Discussion

At the beginning of the activity, lecturers prepare a one-semester activity plan in Exelsa Moodle. Lecturers give an overview of activities for one semester, which includes the form of tasks that must be generated to students.

Practice teaching with elementary school materials

Before elementary school teaching and warming-up, students are asked to come to the front of the class introduce themselves, pretending to be new teachers. The forward sequence is shown randomly. In the checklist, the list of things is checked and written on the blackboard. Otherwise, the checking is done while the students are being observed.

In this elementary school practice, the students perform according to the order of the names in the attendance list. Each student performed for about 15 minutes, so in a two-hour course, four students perform. Students are given the freedom to choose their own topics and strategies. The schedule of students' elementary school teaching practice is uploaded to Exelsa Moodle. They first make a teaching preparation with a predefined format that the lecturer has uploaded in the Exelsa. The preparation is assisted by lecturers in the classroom or they can consult outside the classroom. Their finalized teaching preparation is uploaded at Exelsa Moodle no later than 2 hours before practice.

In this practice, lecturers make the most commentary and input. Students are occasionally given the opportunity to comment on their friends' performance, as they learn the skills of teaching directly. This comment is also uploaded in Exelsa Moodle so all students can read the comments.

After they perform, they get the recording video files of their teaching practice. They were asked to play back the video and do their self-evaluation while teaching. The format of self-evaluation has been determined by the lecturer and uploaded in the Exelsa Moodle. The self-evaluation results are required to be uploaded in Exelsa Moodle no later than 1 week after the show.

After every student finishes practicing in the elementary school teaching, they are asked to write a reflection on the perceived experience until the end of the elementary material practice. They must reflect on the changes they have felt after teaching. The reflection consists of 300 words and is uploaded before the junior high school practice begins.

Practice teaching with the junior high school material

Before teaching the junior high school materials, first the lecturer arranges the schedule based on the order, determines the observer and selects the material to be taught. The practice of teaching junior material lasts for about 30 minutes. The lecturer first uploaded the learning plan format in the Exelsa Moodle. There is one meeting in the classroom where the students jointly organize the preparation of teaching guided by the lecturer. It also explains how observers observe and comment on their performing friends. Every student who performs teaching will be observed and commented on by two students and lecturers. The observation format is uploaded in the Exelsa Moodle by the lecturer.

Before the teaching practice, students upload the final teaching plan at least 2 hours before practice. The Exelsa Moodle facility used is a forum, to enable the students, especially observers to access it before practice. The Observations made by two students are uploaded in the Exelsa Moodle Forum. After all the students have performed, the lecturer also uploads a summary of the comments submitted online. As in the practice of elementary materials, at the end of the junior high school practice, each student writes his reflection and uploads in the Exelsa Moodle Forum so that all his friends can also read and learn from each other's experiences.

Practice of Making Video

This activity was designed because the mid tests took two weeks which did not allow for the practice of learning in the classroom. In addition, this activity is considered important and relevant to the purpose of the course. Previously they were given an explanation on how to prepare materials for filming. This is because the film making is done independently outside of college hours.

Next, the students work in groups of three, so there are 6 groups in the class. They discussed in groups about story ideas, synopsis, and scenario of films to be made and written down in a script. The movie scenario is uploaded in the Exelsa Moodle Forum. On each occasion there is a meeting in the classroom to show and discuss the results of their film making process. Feedback and suggestion from the lecturer and students are used to perfect their movie. The movies that have been viewed in terms of material, capability and time are uploaded on YouTube and the links are uploaded in the Exelsa Moodle Forum. At the end of this short film project, each student is required to write a reflection and upload it in the Exelsa Moodle.

Practice teaching high school materials

In general, the practice of teaching high school materials is similar to the practice of junior high school materials. However, there are several differences. In high school teaching practice, the order of the performing students is made not based on the order in the attendance list. The order is made based on the drawing as suggested by the students. The duration for teaching practice is 45 minutes. Comments from observers and lecturers are shorter. Self-observation is required both in elementary school and the junior high school teaching practice. In the high school teaching practice, the special reflection is directly combined with the reflection of the whole lecture activities for one semester. In general, students rate this lecture as good in the Online Evaluation in Academic Information System, with an average score of 5.7, with very positive student comments. Of the 18 students who attended the lecture, all of them were able to complete the course, in which16 students got A (89%) and 2 got B (11%).

In general, lectures run according to plan, approximately 90% in accordance with the lesson plan. All students are enthusiastic and passionate about taking the course. The tasks are well executed and uploaded in the Exelsa Moodle relatively on time. Their teaching skills seem to show significant progress. Their concern for the progress of their friends is quite high, both as a student and as an observer when commenting and giving feedback.

Practice teaching with elementary school materials

When the students introduce themselves as teachers, quite a lot of dynamics happened. Some of them are used to talking in public, some are still nervous, their voice is still too loud, and the writing is not big enough. Some of his bearing are funny, cheerful, hesitant, and so forth. One of the introductory reflection fragments is as follows:

"Several hours passed, I passed everything well. Our introduction is through "acting" as a new teacher. The activity is quite unique and creative to me, in this way the awkwardness that once was like a wall of separation has begun to crumble. Laughter began our intimacy. Moreover, I acknowledge that the lecturers who are teaching this course are powerful enough and capable enough to embrace us to remove the fearful initial tension. "

Here students also began to enjoy their role as students. Things that did not fit were directly commented by lecturers in order for students to be more skilled in managing the class and teaching. Teaching skills are studied from direct practical cases from students.

When students prepared lesson plans, they seemed quite enthusiastic. They enthusiastically discussed the materials and learning approaches to be used, whether with lecturers or students. They were asked to use props available in the micro teaching room.

Students who became students were also quite supportive in the development of their friends' teaching skills. They could pretend as students naturally, although they learned many things from their friends' teaching skills. Here's the reflection from one of the students:

"I was nervous and afraid before the elementary school practice. I was afraid of running out of materials. I also feared that my friends did not want to work together. I prepared everything hastily and with a limited time, I finished the demonstration tools. I had alternative props to be used because I was confused which props were easy to understand and did not require much time. And it was stressful to see a friend who took the first turns run out of time. They panicked and the sound of the bell was a startling. After the practice, I just realized that being a teacher is not easy because I have to prepare everything and teach as well as control the class because students constantly seek attention from the teacher. The change that I felt was that I became less nervous when speaking in front of

the class, but I became a little bit confused because I did not want to be a teacher. I am also happy with this Micro Teaching course because besides being able to learn to be a good teacher we can also learn from any mistakes, shortcomings and evaluation from lecturers for us or other friends so that we do not repeat the same mistakes again and always strive to become professional teachers."

Practice teaching junior high school materials

In this practice teaching, students kept the spirit in the preparation. They are quite solid to help each other. Although some students belonged to different classes and they rarely met, they were quite easy to assimilate and accept. Different abilities among students are utilized so that they could learn from each other. Students who spoke softly learned from whose who spoke loudly. Students who lack self-confidence and courage could learn from those who were brave and assertive.

During the observation of their friends' practice teaching, the students were quite serious in giving comments and suggestions to improve their friends' performance. Likewise, friends must accept the feedback and suggestion gratefully and with an open heart. The suggestion and feedback must also be submitted, uploaded, and discussed in the Exelsa Moodle Forum. The Practice of

Making Video Learning

From their reflection in general students initially hesitate in accepting this task, because most of them did not have any experience in making a movie. During the briefing, lecturers boosted the students' spirit that they could do it. Through systematic steps and the support from the material resources, students do the task enthusiastically and whole-heartedly.

In the process of making the video, students discussed very intensely in the group. In the initial viewing discussion, they also gave each other feedback for the improvement of the film. Lecturers continue to encourage, suggest and propose a solution of the existing problem. One piece of reflection in filmmaking is as follows:

"From making this short film I get a lot of benefits, especially when it comes to prospective teachers. I became more interested in how to make the film, from the beginning until the end. However, during the filming I still had to ask for help here and there, and I had to repeat, edit, take back, and so on. So the spirit must be maintained, never give up despite failing continuously. I also learned that being a teacher is not only teaching in front of the class, being an expert in the material, but also being a creative teacher. The benefits may not be seen now. Probably, when one has become a teacher will he/she see the benefits. The most important thing is that the student has first-hand experiences in making the film. But the drawback is of the limited time. In reality, teachers' jobs cover not only teaching but also school management which takes so much time."

Practice teaching high school materials

In practice, this is the culmination of their skills that have been quite honed in the previous practices. The material they teach is also quite difficult and the time they spend is also quite long. In general, their ability and teaching skills show good progress.

Their enthusiasm either as teachers, students or observers does not recede; they remain passionate and enthusiastic in displaying their best abilities. Some students still have to deal with lack of material understanding. This is reasonable, since the material mastery when teaching is clearly required over a period of time. One of students' final reflection regarding the teaching of high school materials is as follows:

"After a special round in mini drama was completed, the final round was announced. It was high school teaching practice. I no longer play a role in the final scene. The initial state began to change, I felt I was among family. I could adapt very well. There was no more awkwardness that I experienced until the process which I called "Mini Drama" was over. I get everything in this subject, be it science, advice and family. I'm ready to be a teacher and have a dynamic with anyone, anytime and anywhere. This is the path I choose. I have completed one of the short mini dramas of my life, and now I am ready for other amazing dramas that are waiting for me to play a role in it .... "

Thus, in general, the lecture has been run as planned and the goals determined have also been generally achieved, from the aspects of Competence, Conscience and Compassion (3C).

Conclusion

In general, the implementation of learning is about 90% in accordance with the plan. The expected final achievement is generally achieved, namely that students have good skills in managing mathematics learning in the scope of Competence, have high spirit in developing teaching ability (Conscience) and have high concern in helping their friends to develop their teaching skills (Compassion). The results of the students' evaluation in general are also good, with an average score of 5.8 and with very positive comments. The grades obtained by students are also very good, in which 89% earned A and 11% got a B. The use of Exelsa Moodle was also quite optimal, in which the course design and explanations and materials used in the lectures could be well communicated. Videos from short film projects with mathematical themes could also be produced properly and were uploaded on Youtube.

In this lecture, the video recording of the teaching practice still tends to be used as a collection in the student laboratory. Actually, these videos can be utilized as examples in the discussion of teaching skills, in terms of material mastery, delivery or class management.

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NURSING STUDENT'S EXPERIENCE IN CARING CHILDREN WITH DISABILITY: A QUALITATIVE STUDY

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Abstract
Caring children with intellectual disability remains a challenge for nursing students due to unprepared feeling and lack of experience. Therefore it is important for the nursing students to increase their self-awareness in caring children with intellectual disability through their clinical placement. The aims of this study are to explore the experience of the nursing students caring children with intellectual disability. A qualitative approach using a phenomenological was applied to explore the experience of the nursing students in caring children with intellectual disability. One time semi-structured interviewed were conducted. Data were collected through personal interviews about their experience and the transcripts of these interviews were subjected categorically. Data analysis identified the emerging themes as changing perception, communication challenges, and life value in caring children with intellectual disability. Findings suggest strategies to promote competencies of the nursing students in caring children with intellectual disability.

Keywords: intellectual disability, nursing students, qualitative research

Introduction

Intellectual disability is neuro-developmental disorder classified as mild, moderate, severe and profound mental retardation according to ICD-10(1) (1) (WHO, 2010). Smiley (2007) mentioned that the incidence of people with intellectual disability as much as 2% of the population. The prevalence of children of 24-59 months with disability in Indonesia based on Riskesdas 2013 was 0,53% (Kemenkes, 2014). Furthermore, this information help to design the effective intervention for children with disability, so that they have the same chance to reach optimal function in their life (Isfandari, 2009). RCN (2017) mentioned that children with a mild intellectual disability may only need support in understanding health information, accessing health screening program or managing any complex health care, but children with a profound intellectual disability may need full-time support.

Children with intellectual disability have right to be educated in the school and accessed health care appropriately to prevent discrimination and inequality. It is a challenge for nursing education to prepare their student to have competency in

providing direct care for children with intellectual disability because they have a lifelong condition with difficulty in everyday tasks. Nursing students need to know how to caring children with intellectual disability to increase their competence. However, there is a lack of research that addresses the experience of nursing student caring children with disability. There is no discrimination in accessing health service and education wherever appropriate, especially in the school. School nurses play an important role in giving care to the same levels of service as other children. By directing their contact with complex of children with an intellectual disability, the nursing student gets experience in their clinical practice in a special school.

Working with children with disability remains a challenge for nursing students due to unprepared feeling and difficulty to communicated effectively (Singer, 2012). This accordance with Fisher, Frazer, Hasson, and Orkin (2007) found that lack of education in disability studies and a lack of experience may impend nurse to provide health care for children with intellectual disability. The aims of this study are to explore the experience of the nursing student working with children with intellectual disability. The research question was explored during this qualitative study what is the experience of nursing students in caring children with an intellectual disability?

Method

Study design

A qualitative study using a phenomenological was applied to explore the experience of the nursing student in caring children with intellectual disability. Data were collected using one time semi-structured interviewed through personal interviews about their experience in caring children with intellectual disability.

Participants

There were a total of 40 nursing students who take a clinical placement in caring children with disability, however; only 7 of the 40 nursing students have willing to participate in this study. The purposive sampling was chosen in this study in order to elicit the true experience of the nursing students in caring children with disability. Most of the participants were females and only one of them was male. All of them were 22 years old and in third grade of applied nursing study program Magelang, Poltekkes Kemenkes Semarang, Indonesia.

Ethical consideration

Institutional Review Board permission was obtained from Poltekkes Kemenkes Semarang that the researcher attended as well as the study school district. The nursing students signed informed consent prior to the study. All of the research materials were handled exclusively by the researcher and no student names were associated with any final written materials.

Data collection

The study was conducted in a public school setting in the special school, Balai Besar Rehabilitasi Sosial Bina Grahita (BBRSBG), Temanggung, Central Java. The nursing students were arranged for a 3-week clinical placement in BBRSBG, after finished their study for disability module in one semester in nursing program study, BBRSBG is a school for children with special needs

facilitates nursing students to practice nursing clinical placement as their new learning experience. This condition provides valuable learning opportunities for nursing students develop their communication skill in caring children with intellectual disability (Southgate, 2012). They learn to apply communication technique and nursing management in caring children with learning disability in school settings. Semi-structured interview was done at a mutually agreed upon time and place. After the interview was completed, data collection was done to gather the nursing student's experience in caring children with disability.

Data analysis

Once data were collected, a categorical analysis was used to analyze data and findings were reported using a narrative format. Data were analyzed using categorical analysis and transcribed after the interview occurred. The transcripts of these interviews were subjected categorically. Data were coded according to common experience. After that data were categorized into themes and interpreted to answer the research question. The final data were cross-checked among the researcher and with the participants to ensure the credibility of the research.

Findings and Discussion

Seven nursing students who underwent clinical placement in the special school participated in this study (see table 1).

Table 1. The sociodemographic characteristics of nursing students

Participants Pseudonym	Age	Sex	Grade
Hanna	22 years old	Female	Third grade
Emma	22 years old	Female	Third grade
Lisa	22 years old	Female	Third grade
Vanny	22 years old	Female	Third grade
Elly	22 years old	Female	Third grade
Sally	22 years old	Female	Third grade
Garreth	22 years old	Male	Third grade

The interactive experiences nursing students with children with intellectual disability give the students the opportunity to learn for the first time and practice the role as a caregiver. The nursing student demonstrated 3 common themes in caring children with intellectual disability. All of the details are as discussed below. A summary of the themes is shown in figure 1.

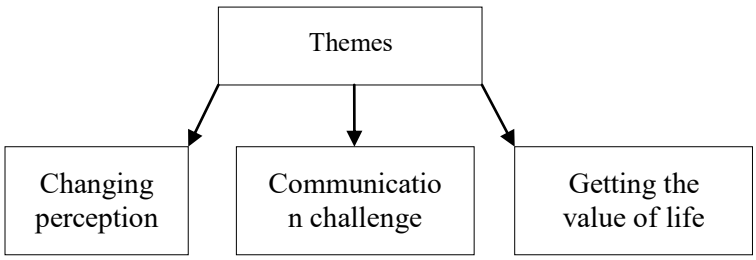

Figure. 1. Themes identified through analysis of caring children with intellectual disability during clinical placement.

Changing perceptions

The nursing students were encouraged to identify their perception of children with intellectual disability. Most of the nursing students avow stigmatization and marginalization of children with intellectual disability, but their perception was changed after they had interaction with.

> "I have expressed pessimistic with the label of intellectual disability, but when the first time I met them in the special school, they have shown hospitality more than usual kids. They behave politely, although some of them less cooperative. This occurs as a result of difficulty to participate in the activity." (Hanna).

> "I have thought that they prone to be lazy, but after we gave direction to simple instruction, they have a passion to follow it." (Garreth).

> "First time I met in the class, the children easily directed and manageable, it differs with my perception about their challenging behavior because of their disability. Now I have a better understanding of them." (Sally).

> "For the first time, I was surprised how they were so excited about our coming as if they have a new friend. That really changed my perception and it was really awesome to feel that way." (Vanny).

> "Now I would not stigmatize disability for did not have an ability, they were unique and special children who need caring." (Emma).

Communication challenge

Practicing effective communication is a challenge for nursing student dealing with different characteristics of children with intellectual disability. Collaboration with other healthcare member is another communication challenge in caring children with intellectual disability. Thus, the nursing student in this study applied their communication skills and learned to sharpen it during administering nursing care. The opinions of nursing students collectively support communication challenge, as demonstrated below:

> "Some children have unique ways of communication, some of them speaks fluently, but did not reach to the specific topic. In dealing with profound intellectual disability, patience was needed." (Lisa)

> "I learned to approach children in a proper way so that he/she can understand me and follow my simple instructions." (Elly)

> "They wanted to be heard. What they said to be heard well. I learned about their gesture, and using nonverbal communication is a challenge for me. (Sally).

> They become more sensitive if I did not sincere and genuine in what I say they can feel it. If they did not feel comfortable, they did not want to listen to us. (Vanny)

> "The special school gives us a chance for giving intervention in the class, and we also learn how to communicate in collaboration with psychiatrist and psychologist in caring children with intellectual disability." (Garreth).

Getting the value of life

The findings demonstrated that nursing students learned the value of life during their experience. The value of life as displayed below:

> "I started to realize you know how the children are going through and struggle with their life. I get connected with the children and realize the bigger picture. Sincerity is the important things in caring children with disability." (Hanna)

> "I am so fortunate and I cannot even begin to describe how grateful I am for a chance to have gone through my experience. They give me spirit I learned to be tough and fortitude. Sometimes I catch myself looking down on children for their issues."(Emma)

> "I am taught a certain thing from them. They were always excited despite their condition and they learned to respect each other. They interact lovingly and caringly." (Lisa)

All the participants were considered in the results and the data were included in the analysis. There was no issue of a difference of opinion between the 2 researchers during the process of theme extraction. This study explored the experience of nursing students in caring children with intellectual disability. The analysis of data provides information on the summary of the experience while caring children with intellectual disability from the clinical placement. Among the participants in this study, the nursing student's experience was explored as providing an information about changing their perception. The results demonstrated the process of changing perception from stigmatization into understanding the characteristic of children with intellectual disability. Nursing students needed to understand the task and make them understood the instruction. They need more time to think and grab relevant information from memory, so they could communicate their thoughts and feelings (WWILD, 2012). The results of the current study supported the fact that the students benefitted from the interaction. Antonsson et al. (2008) mentioned that if the interactions success, it to positive influences but if it is not, the interaction would lead to irritation, aggression, and violence among services user.

The children with intellectual disability usually have unique communication and unclear conversation. Emerson (2001) found that 60% of people with intellectual disabilities commonly used symbolic communication through pictures, symbols, signs or speech to communicate. The difficulty in communication associated with intellectual disability can be a barrier for children to express their

needs. Emerson (2001) found that 60% of people with intellectual disabilities commonly used symbolic communication through pictures, symbols, signs or speech to communicate. The difficulty in communication associated with intellectual disability can be a barrier for children to express their needs. Therefore it is important for the nursing student to be aware of the communication needs of children with intellectual disability to enable effective communication (RCN, 2017).

Nursing students have the challenge to differentiate when using pre-symbolic, symbolic and verbal communication to children according to their ability in understanding (Baron, 2009). A combination of both verbal and non-verbal strategies should be considered by nursing students. Sherko, Sotiri, and Lika (2013) mentioned that the nurse could use the communication technique such as active listening, sharing observations, sharing empathy. Chew, Iacono, and Tracy (2009) identified the way children with intellectual ability expressed their wants, needs or feelings such as speech, augmentative visual or behavioral cues. Martin, Fenelon, Lyons (2010) also mentioned that care, creativity, and innovation are required in communicated with children with intellectual ability.

Conclusion

From the result of the study, the nursing students also got life value in caring children with intellectual disability. They expressed their feeling which has demonstrated that children have a high sensitivity, so the nursing student learned to be patient. Nursing students had undergone a process of self-evaluation during the experiences. They mentioned sincerity, toughness, fortitude, respect, and love. While recognizing their stigmatization, nursing students showed their passion to give nursing care with plans and suggestions. This is accordance with the research of Cooper et al. that found that their students reflected both positive and negative characteristics in themselves while dealing with different patients.

The main weakness of the qualitative study is that it is not possible to make quantitative predictions. However, the strength of this research is that this study provides an understanding of nursing students' experiences in caring children with intellectual disability. In conclusion, the nursing students were being encouraged to be aware of their self-process in caring and develop their sensitivity and a new sight in caring children with intellectual disability.

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THE EFFECTIVENESS OF CAREER GUIDANCE PROGRAM FOR PSYCHOLOGY STUDENTS

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Abstract
Making a career decision is a complex process. Although some people make decision easily, others face difficulties in making their career decision. Therefore, identifying their difficulties in career decision-making process is an essential step to provide students' needs in their career planning. According to Gati, Krausz, and Osipow (1996), the proposed taxonomy of career decision-making difficulties was developed through interaction and sequential interplay between theoretical considerations and empirical testing. Specifically, in the proposed taxonomy the difficulties are divided into three major categories. The first major category is *Lack of Readiness*. Then the second and the third major categories are *Lack of Information* and *Inconsistent Information.* The participants of this study were 95 psychology students divided in two groups (experimental and control groups). The aim of this study is to describe career decision-making in psychology students and to determine the difference of career decision-making difficulties in students with different semesters. The result of this study shows that The Career Guidance Program is effective for decreasing difficulties of career decision-making (lack of information, inconsistent information, and total difficulty), but less effective to decrease the lack of readiness.

Keywords: career decision-making, career guidance, psychology students

Introduction
Students are learners who are registered and studied at certain universities (Government Regulation No.30 of 1990). Based on statistical data from the Directorate General of Higher Education (2015), currently there are 3,612,286 active students who are studying Strata 1 or the undergraduate education, while in Jakarta there are 501,191 active students, with an age range between 18-30 years old. According to Arnett (in Lemme, 2006) the age of 18-25 years old is a new stage of life. The transition period between adolescence and early adulthood is the length of time an individual gains the freedom to make long-term decisions. Decision making here includes career-related decision-making. Career-related decision-making is complex. Individuals may have difficulty in doing so. The difficulties individuals experience during the career decision-making process can

be classified into two categories, the lack of information and information inconsistencies. The lack of information includes about their own selves, work, and how to obtain the information. While the inconsistency of unreliable information includes internal conflicts, and external conflicts (Gati, Kraus, & Osipow, 1996)

In students who have entered a particular department or course of study, career choices should have been limited to the study field. Nevertheless, it is often found that final-year students find it difficult to make career decisions because there are lack of information about the career that they can take after graduating from university or because of there are so many career opportunities that can be taken. The examples here are the psychology students. Psychological science itself is divided into various areas of study, such as Educational Psychology, Clinical Psychology, Developmental Psychology, Industrial and Organizational Psychology, Forensic Psychology, and so forth. Each field of study has different career opportunities that require different tasks and competences.

Psychology Faculty of X University, conducting Career Guidance Course which aims to help students plan their career. The lecturer in this course creates a career guidance program, which contains a series of activities that can help students from career planning to career decision making. Nevertheless, the program has never been evaluated for its effectiveness on students' career decision-making abilities. Therefore, this study aims to determine the process of career decision-making on students, as well as evaluate career guidance program on students. Furthermore, this program is expected to be a model of career guidance programs in other education levels, such as high school or vocational high school.

Career Decision-Making

According to Gati, Krausz, and Osipow (1996), making a career decision is a complex matter. The career decision-making process has the same characteristics as in other decision-making processes, meaning that the process involves an individual choosing what he or she feels most appropriate from career possibilities based on comparison and evaluation of career alternatives, taking into account the reality that the comparison and evaluation process is influenced by both the characteristics of the educational/professional program and the individual character. In addition, the career decision-making process has several distinctive features, such as, an individual makes decisions of various career possibilities, for every career alternative there is abundant information available, and the fact that various aspects of the profession should be considered (e.g. duration of the educational process, independence in work etc.).

In career decision-making, the individual's ability impacts on whether the individual is accepted for the training or work he or she wants, while the ability of the individual also plays an important role in career decision-making (Gottfredson, 1986, in Gati, 2013). Individual capability measurement is often done as a consideration during the counseling process (Gottfredson, 2005; Osipow & Fitzgerald, 1996, in Gati, 2013). Measurement tools with paper and pencil, like intelligence test, only includes several capabilities. Individuals should use self-estimation in making consideration in career decision-making. Prediger (1999, in

Gati 2013) states specific domains on self estimation capability are more relevant in career selection than in general ability (intelligence).

Campbell and Hefferman (in Gati, 2009) classify difficulties in career decision-making in several categories and sub categories. The proposed taxonomy divides the difficulties of career decision-making into three major categories: 1) lack of readiness, 2) lack of information, and 3) inconsistent information. Taxonomy of career decision-making difficulties illustrates that there are two parts to the difficulty of career decision-making, based on the timing of the emergence of the difficulty. First, difficulties arise before starting the career decision-making process, and the second, difficulties that arise during the career decision-making process.

In difficulties before starting the career decision-making process there are categories of lack of readiness, including: lack of motivation, general indecisiveness, and dysfunctional beliefs. While on the difficulties facing individuals during the career decision-making process, there are two main categories. Category concerning lack of information, including: lack of information about the career decision-making process, lack of information about the individual's own self, lack of information about work, and lack of information on how to obtain information. The next category deals with inconsistent information, including: unreliable information, internal conflicts, and external conflicts.

Psychology Students

According to Sarwono (cited in "Definition of Student's Definition According to Experts, 2012), the student is every individual who is officially registered to attend college studies in university with the age limit of about 18-30 years old. Furthermore, Arnett (cited by Lemme, 2008) states that in that age period (which age 18-25) is a transition period from adolescence to early adulthood where an individual has the freedom to take long-term decisions. In this period Piaget (in Santrock, 2011) in his cognitive development theory also classified this early adulthood in the fourth period, formal operations in which the individual has the capacity to think systematically for abstract and hypothetic information.

Furthermore, psychology is a discipline of science about scientific research on mental behavior. It not only explains what we do and how we behave, but also examine the flow of thought and reason behind our actions. Ranging from perceptual thinking, cognitive recognition, and interpersonal relationships, psychological theories and information are often used to solve problems in a wide range of human activities. Some psychology studies include: developmental psychology, social psychology, personality psychology, educational psychology, industrial and organizational psychology, educational psychology, and clinical psychology.

Developmental psychology is a field of psychology that examines human development and the factors that shape a person's behavior from birth to elderly. Developmental psychology is closely related to social psychology, since most developments occur in the context of social interaction. Developmental psychology also closely related to the personality psychology, because the development of individuals can form a distinctive personality of the individual.

Furthermore, social psychology has 3 scopes, namely the study of social influences on individual processes, such as the study of perception, learning process motivation, attribution; the study of group processes, such as language, social attitudes, imitative behavior and so on. Then the personality psychology is the field of psychology that studies the behavior of humans in adjusting to the environment, personality psychology is closely related to developmental psychology and social psychology, because the personality is the result of individual development since childhood and how the individual itself doing social interaction with the environment. The next study is educational psychology. This field of study seeks to create a supportive situation for students in developing academic, socialization and emotional skills which aims to form the mindset of the students. Furthermore, industrial and organizational psychology focuses on developing, evaluating and predicting the performance of a work done by the individual. The field of clinical psychology is the field of psychology and also the application of psychology in understanding, preventing and restoring the individual psychological state to the normal threshold.

Method

This research used a research design in the form of two groups, namely a pretest-posttest design. There was one experimental group that received treatment and one control group that was not treated. Measurements were performed twice in each group, which are before treatment (pretest) and after treatment (posttest). The treatment in this research is a career guidance program.

Participants in this research are students of 6th semester of Faculty of Psychology at private university in Jakarta. Overall, the number of participants in the study was 95 participants. The number of participants in the experimental group was 56 participants (58.9%), while 39 other participants (41.1%) were included in the control group. The sampling technique in this research is purposive sampling.

Measurement in this study is using Career Decision-making Difficulties Questionnaire (CDDQ). This CDDQ measuring instrument was developed by Gati, et al. through his research entitled "A taxonomy of difficulties in career decision making" (1996). Furthermore, in 2016, Imda (2016) translates this CDDQ measuring instrument in his thesis research entitled "*Pelatihan Model PIC dalam Mereduksi Kesulitan Pengambilan Keputusan Karir pada Remaja Panti Asuhan*". (In English: "PIC Training Model in Reducing Career Decision-Making Difficulties in Teen Orphans"; PIC stands for Prescreening, In-depth Exploration, Choice).

Findings and Discussion

Description of Intervention

The intervention process consists of eight meeting session. In general, the study participants looked enthusiastic in following each intervention session. Their enthusiasm appears in the form of questions asked, as well as the willingness and passion shown in each process of the activities undertaken. The eight sessions include the following: 1) The first session is an introduction, an

explanation of the intervention, mapping the participants' career picture through open-ended questions, and pretest, 2) The second session is the search for participants' potential and interests based on Donald Super and Holland's career theory, 3) The third session is a reflection of the advantages and weaknesses of the participants, as well as the search for the value of each work alternatives that the participants are interested in, 4) The fourth session is to create a list of career alternative considerations that are divided on the supportive considerations and the deliberate considerations, 5) The fifth session is the career decision-making based on the considerations that have been made, 6) The sixth session is the career planning in the next 5-10 years, 7) The seventh session is a presentation in front of the facilitator and other participants about the career exploration process that has been done by students, and 8) The eighth session is posttest and evaluation of the intervention process that has been done.

Description of Variable Research (Pre-Post)

In the experimental and control groups, overall or per dimension, the difficulty level of career decision-making during the pretest and posttest held by most participants was moderate or intermediate. This can be seen from the mean scores in the table below. Participants with a mean score of less than 3.329 were classified as participants who had difficulty making career decisions at a low level, mean scores 3.330 to 6.329 were classified as moderate, and mean scores over 6.330 were ranked as high.

Table 1. Difficulty level of Career Decision-Making in Experimental Group

	Pretest			Posttest		
	Low	**Moderate**	**High**	**Low**	**Moderate**	**High**
LoR	5	47	4	9	43	4
LoI	13	31	12	27	24	5
II	15	37	4	28	25	3
Total	10	42	4	20	32	4

Note: LoR =Lack of Readiness; LoI = Lack of Information; II = Inconsistent Information; Total = The Total of Difficulty Level of Career Decision-Making

Table 2. Difficulty level of Career Decision-Making in Control Group

	Pretest			Posttest		
	Low	**Moderate**	**High**	**Low**	**Moderate**	**High**
LoR	5	32	2	6	32	1
LoI	13	24	2	10	24	5
II	16	22	1	12	26	1
Total	11	27	1	10	27	2

Note: LoR =Lack of Readiness; LoI = Lack of Information; II = Inconsistent Information; Total = The Total of Difficulty Level of Career Decision-Making

Roughly speaking, it can be said that the difficulty level of career decision-making in the experimental group decreased after the experiment or manipulation was done. Major decreases occur particularly in the dimensions of lack of information (mean differences (MD) = 1.06), inconsistent information (MD = 0.85), and total career decision-making difficulties (MD = 0.72). While the dimensions of lack of readiness only slightly decreased from pretest to posttest (MD = 0.25). Different things happen to the control group. In the control group,

the score of career decision-making difficulties actually increased from pretest to posttest. The increase is quite large especially in the dimensions of lack of information (MD = 0.52). While the dimensions of lack of readiness (MD = 0.13), inconsistent information (MD = 0.17), and total career decision-making difficulties (MD = 0.27) only slightly increased from pretest and posttest.

Table 3.Dimension Description of Difficulty Level of Career Decision-Making

		Pretest				Posttest			
		LoR	**LoI**	**II**	**Total**	**LoR**	**LoI**	**II**	**Total**
Experimental	*Mean*	4.89	4.94	4.44	4.76	4.64	3.88	3.59	4.04
	SD	1.01	1.73	1.48	1.18	1.24	1.69	1.18	1.33
Control	*Mean*	4.50	3.99	3.86	4.12	4.63	4.51	4.03	4.39
	SD	1.22	1.61	1.40	1.24	1.27	1.70	1.48	1.32

Note: LoR =Lack of Readiness; LoI = Lack of Information; II = Inconsistent Information

Comparison Test of Pretest and Posttest Results

Table 4.Comparison Test of Pretest and Posttest Data

	***T* (sig.)**			
	LoR	**LoI**	**II**	**Total of Difficulty**
Experimental	1.981	4.17***	3.59**	4.21***
Control	-0.77	-2.89**	-1.10	-2.32*

*Note: LoR =Lack of Readiness; LoI = Lack of Information; II = Inconsistent Information; * p< 0,05; ** p< 0,01; *** p<0,001*

Based on the results of comparison test using Paired Sample T-Test, in the experimental group there were significant differences in score of lack of information, inconsistent information, and difficulty of overall career decision-making. However, there is no significant difference in readiness level or lack of readiness between before and after manipulation. Referring to the t score and the mean score at the time before and after the experiment is done, it can be said that significant differences occur due to the decrease of difficulty level in career decision-making in the participants.

While in the control group there are also significant differences in the lack of information and the difficulty level of overall career decision-making, but not on the lack of readiness and inconsistent information. However, referring to the t score and the mean score during pretest and posttest, significant differences occur due to an increase in the level of difficulty of career decision-making in participants. Improved scores also occur in other dimensions where there are no significant difference (lack of readiness and inconsistent information).

Overall, it can be concluded that the treatment or manipulation provided during this four-month period is effective in reducing the level of difficulty of decision-making (lack of information, inconsistent information, and total difficulties), but less effective in reducing the level of lack of readiness.

Conclusion

This study aims to determine the effectiveness of career planning programs in Psychology students. This program is conducted in 8 sessions. During the

intervention process the participants seemed enthusiastic about each activity. The experimental group and the control group were taken from the sample of Psychology students in the same semester, which is the 6th semester. The results of this study indicate that the treatment or manipulation provided during these eight sessions was effective in reducing the difficulty level of career decision making (lack of information, inconsistent information, and total difficulties), but less effective to lower the level of lack of readiness.

Advices for participants and students of the Faculty of Psychology in general, should the students seek a broader perspective on a career that can be occupied in the field of psychology. Furthermore, students can choose some career alternatives that match the potential, interest and value owned by students. Students can obtain information about this career through the internet, discussions with lecturers and with alumni who have worked in areas of interest of the students. Further suggestions for the Faculty or Psychology Study Program, the study program should facilitate students with training related to career-planning like this, so later as graduated from the Faculty of Psychology, the students can make the right career decisions for the future and ready to face the working world. Suggestions for parents, parents should invite their children to discuss this career problem since early stage. Parents as the closest people to the children can be a source of information for children to discuss career issues that match their children's character, potential and interests. However, parents need to be wise in expressing opinions and motivating children to be able to make career decisions independently, so that in the end the child can make the right decision because it is well thought out.

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1. Articles have not been published or accepted for publication, or are being considered for publication elsewhere.

2. In addition to the manuscript, a written statement should be attached which clarifies the originality and free of plagiarism.

3. Types of articles suitable for publication include research reports and conceptual ideas.

4. Each article should be between 2,500 and 4,500 words long and in form of essay written in English which includes:
a. Title (15-20 words) in bold type, upper case, and in 12- point size of Times New Roman font,
b. Author's name (without academic degree) with an e-mail address and institution's name.
c. Abstract in English (150-200 words) which includes research problems, methods, and results.
d. Keywords in English (3 - 5 words).
e. Introduction (without subsection) which includes the background and objectives. The introduction section ends with an emphasis on items to be discussed.
f. Theory (literature reviews/theoretical construct) of the research.
g. Method
h. Results (with sections)
i. Discussion (with sections) which includes data analysis, verification of hypothesis, findings, and the interpretation.
j. Conclusion (without sections) which includes the concluding remarks, research implications, and suggestions.
k. Reference list should appear at the end of the article and includes only literatures actually cited in the manuscripts. Reference list should contain at least 60% new primary literatures and at most 40% new secondary literatures. References are ordered alphabetically and chronologically. When writing a reference list, please use the APA style (the sixth edition).

5. Conceptual Idea
a. Introduction
b. Theory
c. Theory Application
d. Conclusion
e. Reference

6. Every section heading is in bold type and in upper case for the first letter, for example, Introduction, and every subheading is in bold type, in italics and in upper case for the first letter of each content word and in lower case for the first letter of each function word, except for the first letter of the function word which begins a subheading, for example, Data Analysis and Engaging Activities and Tasks.

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