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REVISITING MATHEMATICAL RESILIENCE AND ANXIETY AMONG SENIOR HIGH STUDENTS

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Abstract
Resilience is vital in recovering from mathematical anxiety since it gives motivation in pursuing despite obstacles and challenges. This study aimed to measure the mathematical resilience and anxiety of grade 11 students at Visayas State University-Main campus as well as to elucidate its relationship. Secondary data was used in this study from a current paper by Casinillo et al. (2020). Mean average, standard deviation, coefficient of variation, and Spearman rho correlation was employed to summarize and extract inference from the data. On average, the perception scores of students' levels of resilience and anxiety are 82.2 and 29.5, respectively. Results suggested that students are resilient and moderately anxious in learning mathematics. This implies that students are motivated even if they are facing some challenging problems in mathematics. On the other hand, students are somehow uneasy or experiencing a little worry in doing mathematical problems. Findings depicted that there is no significant relationship (*p*-value=0.4725) between the students' level of resilience and anxiety. This means to say that resiliency of students does not lessen the level of anxiety in learning mathematics. In that case, teachers must not only be focusing on the resiliency of their students but also on creativity, self-determination, and motivation, among others. Furthermore, to eliminate the anxiousness of students in facing mathematical problems, teachers must encourage and cultivate their interest in learning mathematics.

Keywords: correlation, mathematical anxiety, mathematical resilience

Introduction
Mathematics is one of the subjects in senior high level with a high demand of complexity and difficulty as well as in the form of abstraction. Consequently, students are experiencing mathematical anxiety that hinders their motivation in learning and affects their academic achievement (Wang et al., 2014). According to Choi et al. (2020), mathematical anxiety is a predictor of the numerical ability of students. It means that anxiety is adversely affecting the cognitive behavior of students which causes tension and stress (Passolunghi et al., 2020). Perry (2004)

depicted that mathematical anxiety has continually haunted most mathematics careers of students by causing them the inability to work positively. Meanwhile, mathematical resilience mediates the effects of anxiety and leads to recovery from the unproductive way of learning. Ariyanto and colleagues (2017) stated that resilience is a way to progress a positive behavior in learning mathematics that will enable students to continue despite the challenges. In that case, it is practical to investigate the role of resilience in students' anxiety in learning mathematics. In fact, several studies in the literature have dealt with the positive stance of mathematical resilience to overcome anxiety in learning (Johnston-Wilder et al., 2013; Johnston-Wilder et al., 2014; Cousins et al., 2019; Muntazhimah and Ulfah, 2020).

The study of Hjemdal (2011) has revealed that the resilience level of students is significantly correlated to anxiety and stress in learning. It is also shown in a study that investigating resilience and its factors may supply suitable interventions to lessen the level of students' anxiety. It is worthy to note that the effect of anxiety on learning is adverse to mathematics achievement. According to Juniati and Budayasa (2020), a higher level of anxiety results to lower mathematical achievement due to depression and stress. On the face of it, mathematical anxiety is a hindrance to students' cognitive thinking and problem-solving skills. Aldrup and colleagues (2020) stated that mathematical anxiety is a problem for most students that results in worrying and unpleasant reactions that adversely affect well-being. Another thing is that anxiety can diminish the students' interest and happiness in learning mathematics. In fact, interest and happiness in learning are important factors of good mathematics achievement (Casinillo & Aure, 2018; Casinillo & Casinillo, 2020). Apparently, it is necessary that teachers must encourage the students and develop their mathematical resilience by being sensitive to their learning attitude to intervene in the process. Hence, studying the students' mathematical resilience and anxiety will help educators and policymakers in the educational system understand, and develop the cognitive behavior and well-being in learning mathematics.

Although resilience and anxiety are well-researched and investigated, some properties of students' mathematical resilience and anxiety are not focused on details. In addition, studies of mathematical resilience and anxiety of senior high students in a University especially in grade 11 students are a bit limited in the literature. Hence, this current study is realized. To accomplish the goal of this research study, it sought the following specific objectives: (1) to measure the level of students' mathematical resilience and anxiety in learning general mathematics; and (2) to determine the relationship between mathematical resilience and anxiety. The significance of this study is to see the role of mathematical resilience in the anxiety of students in learning mathematics. Results of this study may help mathematics teachers understand their students learning behavior in connection to anxiety and create an intervention that might improve their academic achievement. Moreover, the findings may also help mathematics students improve their learning capability, interest, motivation, and well-being, among others. Furthermore, this study may contribute to the body of literature, and serve as a guide for researchers in mathematics education to progress the educational system in the Philippines and beyond.

Method

This study considered a descriptive-correlational research design to elucidate the mathematical resilience and anxiety of grade 11 students. Descriptive statistics and correlation analysis was employed to capture the objectives of this study. A secondary data from the study of Casinillo and colleagues (2020) titled "Assessing Senior High Student's Learning Experiences in Mathematics" was utilized. Table 1 shows the cross-tabulation of the age and sex of students involve in this study.

Table 1. Demographic profile of students

Sex	Age			Total
	16 years old	*17 years old*	*18 years old*	
Female	15	45	11	71
Male	2	37	9	48
Total	**17**	**82**	**20**	**119**

The study focused on the different learning experiences of students in mathematics but has not dug into the different characteristics of their mathematical resilience and anxiety. In that case, the study investigates the characteristics of mathematical resilience and used the Mathematics Resilience Scale (MRS) by Kooken et al. (2013) to seize the level of resiliency of grade 11 students in learning general mathematics. In the questionnaire, a low level of mathematical resilience score refers to the least resilient and a high level of mathematical resilience score refers to the most resilient students. In addition, the said questionnaire deals with six (6) negative questions and seventeen (17) positive questions in relation to the mathematical resiliency of students in general mathematics subjects. Meanwhile, the study also considers a questionnaire for anxiety, that is so-called the Mathematics Anxiety Scale (MAS) formulated by Betz (1978) which measures the mathematical anxiety of students. MAS questionnaire deals with five (5) positive questions and 5 negative questions. A lower score in the MAS tells the least anxious and a higher score tells the most anxious in terms of learning general mathematics. The two said questionnaires (MRS and MAS) follow a Likert scale consisting of the following choices: 5-Strongly agree, 4-Agree, 3-Undecided, 2-Disagree, and 1-Strongly disagree. Table 2 depicts the range of perception scores and their corresponding qualitative response.

Table 2. Summary of students' perception score and their over-all response

Range of perception Scores	Response
1.00 – 1.80	Strongly disagree
1.81 – 2.60	Disagree
2.61 – 3.40	Undecided
3.41 – 4.20	Agree
4.21 – 5.00	Strongly agree

Readers may pertain to the study by Casinillo et al. (2020) in regards to the scoring guidelines of both MRS and MAS questionnaires. Table 3 shows the reliability test (Cronbach's alpha) which indicates the two instruments are reliable to use (Cronbach, 1951).

Table 3. Reliability test for the research instrument

Instrument	No. of Items	Average Inter-item Covariance	Scale Reliability Coefficient
MRS	23	0.1591	0.8743
MAS	10	0.2762	0.8289

In data management, the study used descriptive measures (mean (M), standard deviation (SD), and coefficient of variation (CV)) to summarize and evaluate the variables of interest. Moreover, in elucidating the relationship between the mathematical resilience and anxiety of students, the Spearman rho correlation coefficient (r) was used and adopted the following range of values and its interpretation (Table 4). Lastly, all calculations in the data analysis were done using a statistical software called STATA version 14.0.

Table 4. Range of correlation coefficient and its interpretation.

Correlation Coefficient (*r*)	Degree of Association
$0.0 < |r| \leq 0.3$	Weak
$0.3 < |r| \leq 0.7$	Moderate
$0.7 < |r| \leq 1.0$	Strong

Note: Adapted from Casinillo and Guarte (2018).

Results and Discussion
Mathematical Resilience

Table 5 depicts the different characteristics of mathematical resilience that are experienced by grade 11 students. It is worth noting that all the coefficients of variation are greater than 10%, which indicates that students' responses are inconsistent and might change depending on their situation (Casinillo & Guarte, 2018). Most of the students understood that struggles and obstacles are normal in working with mathematical problems (M=4.41, SD=0.62). This implies that students are anticipating a challenging experience in doing mathematics activities. Even mathematics teachers are doing some interventions to lessen the difficulties of students in learning mathematics concepts (Utterberg et al., 2019). Students do not believe that nothing can be done if someone is weak in mathematics (M=1.96, SD=1.00). They believe that through hard work and dedication, mathematics can be achieved by someone who is not a good student. Casinillo and Aure (2018) stated that to increase the level of achievement in mathematics, a teacher must cultivate their interest to work hard in doing their class activities. Additionally, students expect that mathematics can be learned by anyone (M=4.53, SD=0.61).

Students also have an understanding that if they face mathematics problems, they will somehow encounter struggles at some point (M=4.36, SD=0.70). Guntur and colleagues (2019) stated that challenges and obstacles are normal in mathematics learning that needs to be addressed to further improve students' understanding. On average, students are likely undecided (M=3.28, SD=0.99) to believe that a certain individual is good or not good in mathematics. In other words, mathematics can be learned by anyone who wants to study the said subject comprehensively. In fact, with the right learning strategies, students can easily comprehend the lessons and activities in mathematics (Lin & Tai, 2015). Students also believe that in the middle of the learning process, it is natural that they can

commit mistakes (M=4.27, SD=0.67). Moreover, students agree that mistakes are meant to be learned to progress their learning ability in mathematics problems (M=4.11, SD=0.81). Santagata (2005) depicted that mistakes must be handled carefully by teachers to avoid the negative response behavior of students. Meanwhile, students disagree that some people cannot learn mathematics (M=2.34, SD=0.94). This goes to infer that students believe that mathematics can be learned by anyone and not by some people only. They also disagree that mathematics can be learned only by smart people (M=1.84, SD=0.81). Gamoran and Hannigan (2000) stated that mathematics can be learned by anyone who wants to put their focus on it and also found out that mathematics is worthwhile to all students.

Furthermore, students believe that learning skills in mathematics can develop their critical thinking skills which are useful in their chosen careers in the future (M=3.96, SD=0.73). Apparently, students depict that without knowledge of mathematics, it is difficult to be successful in life (M=3.45, SD=1.05). In fact, Watt and colleagues (2017) expressed that a mathematics background plays a very crucial role in choosing careers. The overall perception score of students is 82.20 which can be interpreted as "resilient". This implies that students, on average, are motivated to learn mathematics despite the obstacles and challenges that they are facing. According to Ariyanto et al. (2017), a resilient and positive behavior towards learning can progress their mathematical ability to solve challenging problems. In the study of Ishak et al. (2020), it is depicted that resilience is defined as an attribute that results in a positive attitude that adapts to adverse scenarios or challenging situations. On the face of it, through resilience, students can be progressive in their learning behavior and attain a desired academic performance in mathematics.

Table 5. Mathematical resilience of students

	M ± SD	CV (%)	Response[a]
1. Maths is very helpful no matter what I decide to study.	3.82±0.82	21.47	Agree
2. Struggle is a normal part of working on Maths.	4.41±0.62	14.06	Strongly agree
3. If someone is not good at Maths, there is nothing that can be done to change that.	1.96±1.00	51.02	Disagree
4. Maths can be learned by anyone.	4.53±0.61	13.47	Strongly agree
5. Everyone struggles with Maths at some point.	4.36±0.70	16.06	Strongly agree
6. Maths is essential for my future.	4.02±0.92	22.89	Agree
7. If someone is not a Maths person, they won't be able to learn much Maths.	2.56±0.93	36.33	Disagree
8. Good Mathematicians experience difficulties when solving problems.	4.18±0.79	18.90	Agree
9. People who work in Maths-related fields sometimes find Maths challenging.	4.27±0.71	16.63	Strongly agree
10. People are either good at Maths or they aren't.	3.28±0.99	30.18	Undecided
11. Everyone makes mistakes at times when doing Maths.	4.27±0.67	15.69	Strongly agree
12. Maths will be useful to me in my life's work.	3.82±0.82	21.46	Agree

13. People in my peer group sometimes struggle with Maths.	4.18±0.64	15.31	Agree
14. Everyone's Maths ability is determined at birth.	2.24±0.93	41.52	Disagree
15. People who are good at Maths may fail a hard Maths test.	3.53±0.95	26.91	Agree
16. Knowing Maths contributes greatly to achieving my goals.	3.75±0.77	20.53	Agree
17. Having a solid knowledge of Maths helps me understand more complex topics in my field.	3.86±0.83	21.50	Agree
18. Some people cannot learn Maths.	2.34±0.94	40.17	Disagree
19. Learning Maths develops good thinking skills that are necessary to succeed in any career.	3.96±0.73	18.43	Agree
20. Making mistakes is necessary to get good at Maths.	4.11±0.81	19.71	Agree
21. Thinking mathematically can help me with things that matter to me	3.55±0.77	21.69	Agree
22. Only smart people can do Maths	1.84±0.81	44.02	Disagree
23. It would be difficult to succeed in life without Maths.	3.45±1.05	30.43	Agree
Over-all Perception Score	**82.20[b]**		**Resilient[c]**

Note: **a** - See Table 2 for details; **b** - See scoring guidelines in Casinillo et al. (2020); **c** - (23.0-41.4)-Not resilient, (41.5-59.8)-Slightly resilient, (59.9-78.2)-Moderately resilient, (78.3-96.6)-Resilient, (96.7-115.0)-Very resilient.

Mathematical Anxiety

Table 6 shows that the coefficient of variation for all anxiety characteristics is above 10%, which implies that all responses are not consistent (Casinillo & Guarte, 2018). Students are bothered if they have to take more classes in mathematics (M=2.60, SD=0.98) as shown in Table 6. This means that students are worried about the challenges and difficulties when they encountered mathematical problems. Additionally, students are uneasy during their mathematics tests (M=2.50, SD=0.89). In that case, students are not comfortable taking their mathematics examinations due to anxiousness about the challenging problem-solving items.

Table 6 also shows that students are undecided to say that they are at ease or comfortable in any mathematics class (M=2.61, SD=0.89). Moreover, students are worried about their learning ability in cognitive mathematics concepts (M=2.39, SD=0.90). On the face of it, they are facing uncomfortable feelings or anxiousness while answering mathematics problems. Students are undecided if they are uptight while taking exams in mathematics (M=2.72, SD=0.74). This means that they are in the middle of being anxious or not about the challenges and obstacles. According to Milovanović (2020), anxiety is a significant determinant of lower mathematics achievement. In other words, anxiety kills the confidence of students and adversely affects their cognitive thinking. Ramirez et al. (2013) depicted that mathematics anxiety is a negative response to the topics and concepts of mathematics subjects.

On average, students are having a sinking feeling when they are trying to solve hard mathematical problems (M=3.50, SD=0.85). There were times also when these students are experiencing loss of memory and were unable to think clearly in doing mathematics problem activities (M=3.14, SD=1.02). In addition to that, some students feel nervous and not comfortable with mathematics class (M=3.38, SD=1.04). And they are uneasy and confused about what to think during the mathematics problem-solving activities (M=3.45, SD=1.03). Overall, students are moderately anxious based on their perception score of 29.5 (Table 6). This implies that students are troubled when they are doing their mathematics lessons and in times of examinations. Apparently, mathematical anxiety affects negatively the working memory and causes tension and stress to students (Passolunghi et al., 2020). The result coincides with the findings of Aldrup and colleagues (2020) that anxiety causes a problem for students in the aspect of critical thinking ability, and diminishes their motivation and interest in learning mathematics.

Table 6. Mathematical anxiety of students

	M $\pm$ SD	CV (%)	Response[a]
1. It wouldn't bother me at all to take more maths classes.	2.60$\pm$0.98	37.69	Disagree
2. I have usually been at ease during maths tests.	2.50$\pm$0.89	35.60	Disagree
3. I have usually been at ease in maths courses.	2.61$\pm$0.89	34.10	Undecided
4. I usually don't worry about my ability to solve maths problems.	2.39$\pm$0.90	37.66	Disagree
5. I almost never get uptight while taking maths tests.	2.72$\pm$0.74	27.21	Undecided
6. I get really uptight during maths tests.	3.22$\pm$0.80	24.84	Undecided
7. I get a sinking feeling when I think of trying hard maths problems.	3.50$\pm$0.85	24.29	Agree
8. My mind goes blank and I am unable to think clearly when working on mathematics.	3.14$\pm$1.02	32.48	Undecided
9. Mathematics makes me feel uncomfortable and nervous.	3.38$\pm$1.04	30.77	Undecided
10. Mathematics makes me feel uneasy and confused.	3.45$\pm$1.03	29.86	Agree
Perception Score	**29.5[b]**		**Moderately Anxious[c]**

Note: **a** - See Table 2 for details; **b** - See scoring guidelines in Casinillo et al. (2020); **c** - (10.0-18.0)-Not anxious, (18.1-26.0)-Slightly anxious, (26.1-34.0)-Moderately anxious, (34.1-42.0)-Anxious, (42.1-50.0)-Very anxious.

Correlation Analysis

Table 5 shows that students' mathematical resilience and anxiety have a weak correlation (See Table 2 for details). In fact, the relationship between these two variables is not significant (*p*-value=0.4725). This result implies that the level of resilience of students does not lessen the anxiety in learning mathematics. Even if resilience is helping the students cope with the obstacles and challenges, anxiety remains constant as the result suggested. The resilient behavior of students does no anymore affects their anxiety level. Based on the coefficient of variation, only 0.44% of the variation of the resilience perception scores can be attributed to the

anxiety perception scores. This result is not consistent with the findings of Hjemdal et al. (2011) that has shown a significant relationship between the level of mathematical resilience and the level of anxiety of students. Likewise, the study of Trigueros and colleagues (2020) has shown that resilience and meta-cognitive strategies help decrease the level of mathematical anxiety. It proves that resilience gives motivation to learning which is positively related to mathematics achievement. Hence, the result shows a contradictory outcome that mathematical resilience does not influence the students' anxiety. This goes to infer that students lack proper motivation and guidance from their mathematics teachers. Aydin and Aytekin (2019) depict that mathematical anxiety can be controlled by guidance and counseling in the middle of the class session. Moreover, to progress their academic performance and lessen students' anxiety, teachers must cultivate their interest and motivation (Casinillo & Aure, 2018; Casinillo & Casinillo, 2020). Furthermore, in the study of Calderon et al. (2021) and Hood et al. (2021), it is progressive to increase the well-being and happiness in learning of students to develop their level of achievement in mathematics. In fact, lively and active students will result in a positive attitude that gains confidence in facing mathematical problems.

Table 7. Relationship (Spearman rho) between the student's mathematical resilience and anxiety

Variables	Sample size	$\widehat{r}_s$	$\widehat{r}_s^2 x\ 100$ (%)	*p*-value
Resilience and Anxiety	119	0.0665^{ns}	0.4422	0.4725

  Note: ns - not significant.

Conclusion

The study's aim is to investigate the level of mathematical resilience and anxiety of senior high students and its correlation. The students' perception score for their level of resilience in learning mathematics is interpreted as resilient. Students believe that the challenges and obstacles they are facing in mathematics class are just part of their learning experiences. It is also shown that they are somehow motivated to learn mathematics concepts since they think that their learning is useful for their future career. They also think that learning mathematics is helpful in their everyday lives because it develops their cognitive thinking. On the other hand, it is concluded that students are moderately anxious about learning mathematics. Every time they are taking mathematics exams, they feel nervous and uncomfortable due to the challenges and obstacles.

The correlation analysis has shown that students' mathematical resilience and anxiety have no relationship. This implies that the current resilience level does not lessen or influence the level of anxiety. As we all know, anxiety can adversely affect mathematical achievement, hence, it is necessary to investigate factors that may influence anxiety aside from resilience. In that case, it is concluded that interest, well-being, learning attitude, cognitive thinking, and motivation, among others, must be focused on to lessen the students' anxiety and progress their performance in mathematics. It is highly recommended that mathematics teachers must boost a positive attitude toward their students and encourage them to work hard despite challenges and difficulties. Furthermore, teachers must give their students interesting and real-life mathematics activities to motivate them in doing their

learning tasks. For future studies, one may focus on the process of boosting resilience in learning mathematics to diminish the level of anxiety.

References

Aydin, D., & Aytekin, C. (2019). Controlling mathematics anxiety by the views of guidance and psychological counseling candidates. *European Journal of Educational Research*, *8*(2), 421-431. https://doi.org/10.12973/eu-jer.8.2.421

Aldrup, K., Klusmann, U., & Lüdtke, O. (2020). Reciprocal associations between students' mathematics anxiety and achievement: Can teacher sensitivity make a difference?. *Journal of Educational Psychology, 112*(4), 735–750. https://doi.org/10.1037/edu0000398

Ariyanto, L., Herman, T., Sumarmo, U., & Suryadi, D. (2017). Developing mathematical resilience of prospective math teachers. *Journal of Physics: Conference Series, 895*(1), 012062. https://iopscience.iop.org/article/10.1088/1742-6596/895/1/012062/meta

Betz, N. E. (1978). Prevalence, distribution, and correlates of math anxiety in college students. *Journal of Counseling Psychology, 25*(5), 441-448. https://doi.org/10.1037/0022-0167.25.5.441

Calderon Jr, R., Pupanead, S., Prachakul, W., & Kim, G. (2021). Happiness, perceived stress, psychological well-being, and health behaviors of Thai university students: Preliminary results from a multinational study on well-being. *Journal of American College Health*, *69*(2), 176-184. https://doi.org/10.1080/07448481.2019.1657871

Casinillo, L., & Aure, M. R. K. (2018). Econometric evidence on academic performance in basic calculus of science, technology, engineering and mathematics (STEM) senior high students. *Journal of Educational and Human Resource Development (JEHRD)*, *6*, 238-249. https://www.ijterm.org/index.php/jehrd/article/view/101

Casinillo, L. F., & Casinillo, E. L. (2020). Econometric modelling on happiness in learning mathematics: the case of senior high students. *Indonesian Journal of Curriculum and Educational Technology Studies*, *8*(1), 22-31. https://doi.org/10.15294/ijcets.v8i1.38031

Casinillo, L., & Guarte, J. (2018). Evaluating the effectiveness of teaching strategies: The case of a national vocational school in Hilongos, Leyte. *Review of Socio-Economic Research and Development Studies*, *2*(1), 65-80. https://www.reserds.com/vol-2-paper-4/

Casinillo, L. F., Palen, M. A. E., Casinillo, E. L., & Batidor, P. G. Assessing senior high student's learning experiences in mathematics. *Indonesian Journal of Educational Studies*, *23*(1), 44-60. https://doi.org/10.26858/ijes.v23i1.13437

Choi, S. S., Taber, J. M., Thompson, C. A., & Sidney, P. G. (2020). Math anxiety, but not induced stress, is associated with objective numeracy. *Journal of Experimental Psychology: Applied*, *26*(4), 604. https://doi.org/10.1037/xap0000268

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334. https://doi.org/10.1007/BF02310555

Cousins, S., Brindley, J., Baker, J., & Johnston-Wilder, S. (2019). Stories of mathematical resilience: How some adult learners overcame affective barriers. *Widening participation and lifelong learning*, *21*(1), 46-70. https://doi.org/10.5456/WPLL.21.1.46

Gamoran, A., & Hannigan, E. C. (2000). Algebra for everyone? Benefits of college-preparatory mathematics for students with diverse abilities in early secondary school. *Educational Evaluation and Policy Analysis*, *22*(3), 241-254. https://doi.org/10.3102/01623737022003241

Guntur, M. I. S., Setyaningrum, W., Retnawati, H., Marsigit, M., Saragih, N. A., & bin Noordin, M. K. (2019). Developing augmented reality in mathematics learning: The challenges and strategies. *Jurnal Riset Pendidikan Matematika*, *6*(2), 211-221. https://doi.org/10.21831/jrpm.v6i2.28454

Hjemdal, O., Vogel, P. A., Solem, S., Hagen, K., & Stiles, T. C. (2011). The relationship between resilience and levels of anxiety, depression, and obsessive–compulsive symptoms in adolescents. *Clinical psychology & psychotherapy*, *18*(4), 314-321. https://doi.org/10.1002/cpp.719

Hood, B., Jelbert, S., & Santos, L. R. (2021). Benefits of a psychoeducational happiness course on university student mental well-being both before and during a COVID-19 lockdown. *Health Psychology Open*, *8*(1), 2055102921999291. https://doi.org/10.1177/2055102921999291

Ishak, N. H. F. B., Yusoff, N. F. B. M., & Madihie, A. (2020). Resilience in mathematics, academic resilience, or mathematical resilience?: An overview. *Universal Journal of Educational Research*, *8*(5), 34-39. https://doi.org/10.13189/ujer.2020.081905

Johnston-Wilder, S., Brindley, J., & Dent, P. (2014). *A survey of mathematics anxiety and mathematical resilience among existing apprentices*. London: The Gatsby Foundation.

Johnston-Wilder, S., Lee, C., Garton, L., Goodlad, S. and Brindley, J. (2013). *Developing coaches for mathematical resilience*. 6th International Conference on Education, Research and Innovation, Seville, Spain. http://iated.org/iceri2013/

Juniati, D., & Budayasa, I. K. (2020). Working memory capacity and mathematics anxiety of mathematics undergraduate students and its effect on mathematics achievement. *Journal for the Education of Gifted Young Scientists*, *8*(1), 271-290. https://doi.org/10.17478/jegys.653518

Kooken, J., Welsh, M., McCoach, D., Johnston-Wilder, S., & Lee, C. (2013). *Measuring mathematical resilience: An application of the construct of resilience to the study of mathematics.* Paper presented at national conference of the American Educational Research Association, San Francisco, CA.

Lin, S. W., & Tai, W. C. (2015). Latent class analysis of students' mathematics learning strategies and the relationship between learning strategy and mathematical literacy. *Universal Journal of Educational Research*, *3*(6), 390-395. https://eric.ed.gov/?id=EJ1066252

Milovanović, I. (2020). Math anxiety, math achievement and math motivation in high school students: Gender effects. *Croatian Journal of Education*, *22*(1), 175-206. https://doi.org/10.15516/cje.v22i1.3372

Muntazhimah, M., & Ulfah, S. (2020). Mathematics resilience of pre-service mathematics teacher. *International Journal of Scientific and Technology Research*, *9*(1), 1442-1445.

Passolunghi, M. C., De Vita, C., & Pellizzoni, S. (2020). Math anxiety and math achievement: The effects of emotional and math strategy training. *Developmental science*, *23*(6), e12964. https://doi.org/10.1111/desc.12964

Perry, A. B. (2004). Decreasing math anxiety in college students. *College student journal*, *38*(2), 321-325. https://link.gale.com/apps/doc/A119741942/AONE?u=anon~8b0bf2f8&sid=googleScholar&xid=b95fccfe

Ramirez, G., Gunderson, E. A., Levine, S. C., & Beilock, S. L. (2013). Math anxiety, working memory, and math achievement in early elementary school. *Journal of Cognition and Development, 14*(2), 187-202. https://doi.org/10.1080/15248372.2012.664593

Santagata, R. (2005). Practices and beliefs in mistake-handling activities: A video study of Italian and US mathematics lessons. *Teaching and Teacher Education*, *21*(5), 491-508. https://doi.org/10.1016/j.tate.2005.03.004

Trigueros, R., Aguilar-Parra, J. M., Mercader, I., Fernández-Campoy, J. M., & Carrión, J. (2020). Set the controls for the heart of the maths. The protective factor of resilience in the face of mathematical anxiety. *Mathematics*, *8*(10), 1660. https://doi.org/10.3390/math8101660

Utterberg, M., Tallvid, M., Lundin, J., & Lindström, B. (2019). Challenges in mathematics teachers' introduction to a digital textbook: Analyzing contradictions. *Journal of Computers in Mathematics and Science Teaching*, *38*(4), 337-359. https://www.learntechlib.org/primary/p/183518/

Wang, Z., Hart, S. A., Kovas, Y., Lukowski, S., Soden, B., Thompson, L. A., ... & Petrill, S. A. (2014). Who is afraid of math? Two sources of genetic variance for mathematical anxiety. *Journal of child psychology and psychiatry*, *55*(9), 1056-1064. https://doi.org/10.1111/jcpp.12224

Watt, H. M., Hyde, J. S., Petersen, J., Morris, Z. A., Rozek, C. S., & Harackiewicz, J. M. (2017). Mathematics—A critical filter for STEM-related career choices? A longitudinal examination among Australian and US adolescents. *Sex Roles*, *77*(3), 254-271. https://link.springer.com/article/10.1007/s11199-016-0711-1

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STUDENTS' REFLECTION ON THE EXPERIENCE IN ONLINE SCHOOL INTERNSHIP PROGRAM BASED ON EXPERIENTIAL LEARNING

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Abstract
Program Pengalaman Lapangan (School Internship Program), abbreviated as *PLP*, is an obligatory course in the curriculum of study programs under the faculty of teachers training and education. It adopts an experiential field learning to provide comprehensive, direct, and real experiences in school. A long-term goal is set to develop professional teacher competencies. In the Covid-19 pandemic, *PLP* has been implemented online. This research aimed to analyse the students' reflections on experiences in online *PLP* on School Environment to find out to what extent they understand the school environment, good and inspirational experiences, meaning or values that were developed by students, intentions for self-development that arouse based on the experience and reflections, obstacles faced by students and how to solve them. This research was a qualitative research. The results of the study indicated that students' experiences in getting to know the school environment were included in the good category, students gained various good and inspirational experiences, experiences in overcoming obstacles that arose due to the pandemic, developed meaning or values, and developed intentions for self-development as a teacher candidate. Thus, the meaningful learning cycle based on experiential learning was experienced by the students participating in the online *PLP*.

Keywords: experiential learning, field experiences, introduction to school environment, online learning, school internship program, students' reflections

Introduction
     Pengenalan Lapangan Persekolahan/PLP (The School Internship Program) is a compulsory subject for students of *Fakultas Kegururuan dan Ilmu Pendidik/FKIP* (Faculty of Teacher Training and Education). This *PLP* program is an internship program conducted by students by being directly involved in the field at a school. *PLP* is categorized as an experiential or practical course that aims to provide comprehensive hands-on experiences, as prospective teachers, about the school and schooling, as well as develop skills and competencies that a professional teacher should possess. Therefore, *PLP* Program is expected to help students find the identity of a teacher and further strengthen the various competencies of a professional teacher (*Pedoman PLP Lingkungan Sekolah Daring*, 2020).

PLP is an application of experiential learning (EL) that is learning based on real experience. Kolb states that experiential learning is "a process by which knowledge is generated from making meaning as a result of direct experience", or simply "learning from experience" (Zhou & Brown, 2017). Here, students learn through observation, interviews, and direct interaction with the school principal, teachers, students, education staffs, and all parties in the school.

The Coronavirus Disease (Covid-19) pandemic has forced schools and universities to shift totally from face-to-face to online learning (Nariman, 2021). Therefore, during the Covid-19 pandemic, the implementation of *PLP* uses a different model, namely online. This decision referred to the Announcement of a Joint Decree from the Government regarding Guidelines for the Implementation of Learning in the Even Semester of the 2020/2021 Academic Year during the Covid-19 Pandemic on November 20, 2020, in which learning activities both in grade schools and universities were still going on but carried out online. In online learning, teaching activities were carried out through online digital platforms in which schools, teachers and students used e-learning resources (Sahoo, Gulati, & Ul Haq, 2021). Broadly speaking, the concept of online *PLP* was that during the *PLP* implementation period students were in their respective residential locations, and interacted with the school through online communication media. Assistance from and consultation with both supervisors and guiding teachers were also carried out online.

Through the online learning platforms, students and teachers continued to conduct teaching and learning activities, even though they conducted in different places. This online learning policy implemented in most schools in Yogyakarta during the pandemic was that teachers had to be present at school in the working hours, and conducted online teaching activities while students studied at home. The interaction between teachers and students in learning activities was carried out through digital technology-based media, such as mobile phones and laptops that relied on the internet network. Various platforms were used to facilitate ongoing learning activities in the midst of the Covid-19 pandemic, such as the Learning Management System (LMS), Zoom Meetings, Google Classroom, Google Meet, e-mail, WhatsApp social media application, and many others.

As a field practice course, the implementation of online *PLP* was actually considered less than ideal to facilitate students so that they could not have real experience about schooling and develop teacher competence. *PLP* which is based on experiential learning prioritizes experience as the basis for acquiring knowledge. However, due to the worrying situation of sending students to school, and considering that the student's study period would be longer if the *PLP* program was postponed, online *PLP* was finally selected to be the solution. During the pandemic, online learning was the only alternative for continuing education, especially in higher education (Capinding, 2021; Mahyoob, 2020; Purwadi, Saputra, W. N. E., Wahyudi, A., Supriyanto, A., Muyana, S., Rohmadheny, P. S., Ariyanto, R. D. & Kurniawan, 2021).

On the other hand, in online learning during pandemic there were many obstacles, which were often less supportive, for example, the internet connections were not stable, the teacher's or student's voice was not clear, the teaching materials were not standard, students could not concentrate, and the learning processes were not effective, which had an impact on decreasing the student competency

achievement (Ngabiyanto, Nurkhin, A., Mukhibad, H., 2021; Wismawarin, 2020). This phenomenon had prompted many experts and academicians to conduct researches on online learning implementations during the Covid-19 pandemic (Ngabiyanto et al., 2021). Likewise, a research on the implementation of online *PLP* was interesting to conduct.

In Sanata Dharma University, *PLP* is implemented in three stages, which consist of *PLP* on School Environment, *PLP* on Instructional Planning, and *PLP* on Instructional Implementation. In the period of January-February 2021, most of the study programs at FKIP, including *Pendidikan Bahasa Inggris* (*PBI* = the English Language Education Study Program) carried out *PLP* on School Environment, which was conducted in a block/compacted system lasting for ten days. In particular, PBI in January 2021 only conducted *PLP* on School Environment. Concerning this research, the survey that was selected to be the research method were limited to students' participating in *PLP* on School Environment conducted by *PBI* students.

The research questions were formulated as follows: 1) What are the *PBI* students' experiences in participating in the online *PLP* on School Environment in order to recognize the school environment? 2) What good and inspirational experiences have the students obtained from completing the online *PLP* on School Environment in the context of teacher education? 3) How do students solve the problems and obstacles they have faced in conducting the online *PLP* on School Environment? 4) Is the learning cycle in experiential learning theory experienced by students?

Experiential Learning

Morris T. Keeton and Pamela J. Tate (1978) define experiential as "Learning in which the learner is directly in touch with the realities of being studied. It is contrasted with the learner who only reads about, hears about, talks about, or writes about these realities but never comes into contact with them as part of the learning process" (Kolb & Kolb, 2017).

Experiential Learning Theory (ELT) defines learning as "…the process by which knowledge is created through the transformation of experience. Knowledge results from the combination of acquiring and transforming experience." (Kolb & Kolb, 2005). ELT provides a holistic model of the learning process and a multi-linear model of people development. adults. In other words, it is an inclusive adult learning model that intends to explain the complexities and differences between adult learners within a single framework. The focus of this theory is experience, which serves as the prime mover in learning, as knowledge is constructed through a transformative process of reflection on one's experience (Zhou & Brown, 2017).

The learning model developed from Experiential Learning Theory (ELT) contains two different ways to gain experience related to each other (dialectically) on a continuum, namely: concrete experience and abstract conceptualization. In addition, there are also two different ways to change experiences so that learning is achieved, namely: reflective observation and active experimentation. When these four ways are viewed together, they constitute a four-stage learning cycle that students should experience during the learning process. Learners start with concrete experiences, which then lead them to observe and reflect on their experiences. After this reflective observation stage, students then collect their thoughts to create an

abstract concept of what happened, which will serve as a guide for future actions. With this guide, students actively prove what they have built to shape new experiences and renew learning cycles (Kolb & Kolb, 2005; Kolb & Boyatzis, 1999; Zhou & Brown, 2017).
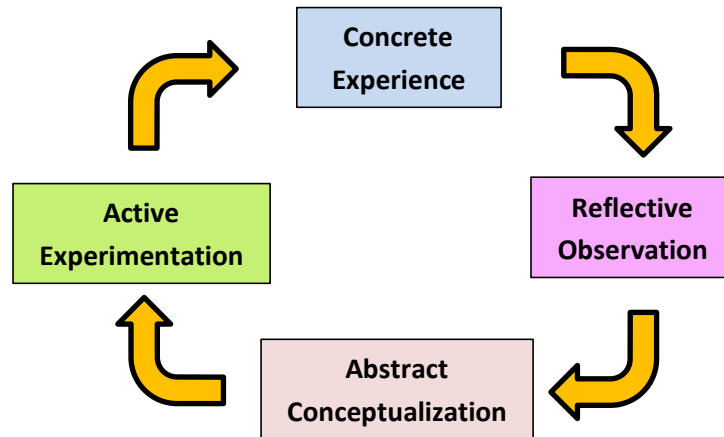
Figure 1. The Four Stages of the Learning Cycle in Experiential Learning Theory

Internship

Internship is a form of experiential learning. Davies states that internship is an experiential learning process, in which students get the opportunity to apply the theory they have learned from school to real work situations (Chen & Chen, 2011). There are many definitions of internship. Pauze, Johnson and Miller view that internship is similar to field work, field experience, practicum, co-op (cooperative education) or experiential learning. Internships are experiential learning that give students the opportunity to integrate and consolidate thought and action. Renganathan, Abdul Karim and Chong define internship as an opportunity for students to incorporate their work experience and knowledge into their studies by being in a supervised and planned professional work environment (Cheong, Yahya, Shen, & Yen, 2014).

In internship activities, students will have the opportunity to find their interests and future work goals under a professional mentor (Chen, Hu, Wang, & Chen, 2011). The importance of integrating classroom learning with real-world practical experience has been recognized as an important component of student engagement and development in higher education. Internships have been recognized as an effective way to bridge classroom learning with professional practice and have been cited as an integral aspect of educational and professional development (Stirling, Kerr, MacPherson, Banwell, Bandealy, & Battaglia, 2017). In the context of teacher candidate education, the internship program provides many benefits. Students have the opportunity to practice teaching in schools, applying the knowledge they have learned in theoretical lectures so as to improve students' teaching abilities. In addition, students also get new information that was not given during lectures. Students gain a lot of experiences through internships at school, such as how to communicate, carry out learning, solve problems, and be aware of student behavior (Filiz & Durnali, 2019).

Pengenalan Lapangan Persekolahan (PLP)

In *Permenristekdikti Nomor 55 Tahun 2017* (Decree of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 55 concerning Teacher Education Standards, it is explained that *Pengenalan Lapangan Persekolahan/PLP* (School Internship Program) is a process of observation and apprenticeship conducted by students of the Bachelor of Education Program to study aspects of learning and education management in an education unit that is school. Meanwhile, *Program Pengalaman Lapangan/PPL* (Field Practice Experience) is the practice learning program in *Program Profesi Guru/PPG* (Professional Teacher Education Program) curriculum intended to practice their professional skill as a teacher at school.

Previously *PPL* belonged to curriculum of undergraduate *Strata-1/S1* program (=Bachelor) in teacher training and education, but after the issuance of *Permenristekdikti Number 55 of 2017*, *PPL* has belonged to *Pendidikan Profesi Guru/PPG* Program. Referring to this *Permenristekdikti*, *PLP* is obligatory experiential learning in S1 curriculum.

In the curriculum of study programs at the Faculty of Teacher Training and Education, Sanata Dharma University, the School Internship Program Program, namely *PLP*, consists of 3 parts: 1) *PLP* on School Environment, 2) *PLP* on Instructional Planning, and 3) *PLP* on Instructional Implementation. *PLP* on School Environment aims to build the foundation of educator identity and enhance educational academic competence. *PLP* on Instructional Planning aims to enhance the academic competence in education and professional competence in the related field of study that is English education, and the basic ability of prospective teachers to develop instructional instruments. *PLP* on Instructional Implementation aims to provide initial experience (such as being a teacher assistant) to prospective teachers in implementing academic competence in education and professional competence, through guided teaching by a professional teacher at school (*Pedoman Pelaksanaan PLP, 2020a*).

There was no change in the learning outcomes of online *PLP* on School Environment, as compared to the previous implementation of the normal *PLP* which was conducted at school. There are three learning outcomes of the *PLP* on School Environment course, namely: 1) getting to know the school culture; 2) recognizing the characteristics of students; and 3) recognizing the image of an educator's identity.

The school locations for the online *PLP* implementation were also different from the *PLP* implementation before pandemic. All students participating in *PLP* before the pandemic conducted *PLP* in partner schools located in the DIY and Klaten areas. The implementation of *PLP* during pandemic provided opportunities for students to conduct *PLP* in schools located near their homes, especially for students who were returning to their home areas, outside the DIY and Klaten areas. In this case, students found their own school in which they conducted *PLP*. Students who stayed outside DIY and Klaten were also allowed to take *PLP* in DIY area.

Method

This research was a qualitative research. The purpose of this study was to analyse the results of reflection on the experiences of students participating in online PLP School Environment to find out the experiences of students in getting

to know school culture, students, and the identity of teachers; positive experiences gained; inspirational experiences; attitudes or values that develop in students; intentions/plans in the future as a follow-up to the meaning that has been obtained, especially for self-development as a prospective teacher; and problems/obstacles faced by students, as well as how to overcome these problems.

This research was conducted to students of the English Education Study Program, Faculty of Teacher Training and Education, Sanata Dharma University, Yogyakarta, who have implemented *PLP* on School Environment. Data were collected by means of questionnaires which were distributed to students with a google form link. The questionnaire consisted of questions to reveal the implementation of online *PLP* on School Environment, and the results of reflections on student experiences while implementing the program. Broadly speaking, the questionnaire comprised: 1) the identity of the student, 2) the process of implementing the *PLP on* School Environment, which included the place of implementation of the *PLP*, the place of residence while carrying out the *PLP*, and the process of implementing the *PLP* (consultation process with the civil servant teacher, how to obtain information/data needed), used platform/technology application to get information/data online, 3) reflection of student experience, which included: a) Experience of getting to know the school culture, students, and teacher identity; b) positive experiences; c) inspiring experiences; d) meanings or values that developed in the individual students; e) intentions/plans in the future as a follow-up to the meaning that has been obtained, especially for self-development as a prospective teacher; f) problems/obstacles faced by students, and g) how to overcome these problems.

The obtained data were analyzed descriptively. Descriptive analysis was used to describe the data that had been collected without intending to make conclusions that applied to the general public or generalizations (Sugiyono, 2018). To find out to what extent the student experienced in getting to know school culture, students, and the identity of educators, a Likert scale was used. The data obtained were quantified and described based on categories which were interpreted using Benchmark Reference Assessment (PAP) Type II with percentile values as follows:

Table 1. Percentile Value Benchmark Reference Assessment (PAP) Type II

Percentile Values	Category
81%-100%	Very good
66%-80%	Good
56%-65%	Enough
46%-55%	Not good
0%-45%	Not very good

Findings and Discussion
Findings
Respondent Description

Respondents in this study were 62 students. Based on gender, the informants consisted of 15 (24.2%) male students and 47 (75.8%) female students. Based on places where the *PLP* on School Environment were implemented, as many as 53 respondents or 85.5% carried out *PLP* on School Environment in schools located in the DIY and Klaten areas and 9 respondents or 14.5% carried out *PLP* on School

Environment in schools outside the DIY and Klaten areas. Based on the place of residence, as many as 43 respondents or 69.4% lived in DIY and Klaten areas when carrying out *PLP* on School Environment and 19 respondents or 30.6% lived outside DIY and Klaten areas.

PLP on School Environment Implementation Process

Although *PLP* on School Environment was originally designed to be carried out online, in reality there were several schools that provided opportunities for students to come to school, conducted observations and direct interviews with various parties in the schools. The following describes in details the process of implementing *PLP* on School Environment, both online and offline, in DIY and Klaten areas as well as outside the areas.

Consultation with Guiding Teachers

During PLP on School Environment, consultations with the supervising teachers were carried out in several ways, namely: 1) face-to-face (Students were given the opportunity to come to school); 2) online from the place of residence; and 3) both. The proportion and number of students who consulted with their supervisors in each method are as follows:

Tabel 2. How to Consult a Guiding Teacher

How to Consult	Amount	Percentage
Face to face	11	17.7 %
Online from residence	21	33.9 %
Both of them	30	48.4 %
Total	**62**	**100%**

From Table 2. above, it is known that most of the students consulted in two ways, namely face-to-face and online, as many as 48.4%. Meanwhile, 17.7% of students consulted face-to-face, and 33.9% of students consulted online.

How to Get the Information/Data Required

There were several ways to get the information/data needed by students from the school, namely: 1) communicating with the school online; 2) communicate with the school face to face; 3) direct observation to schools; 4) through the school's website; 5) others. Each student obtained data from the school in one or more ways. The following is data of how students obtained data from schools:

Table 3. How to Get Data (1)

How to Get Data	Amount	Percentage
Online communication only	3	4.8 %
Online communication, face-to-face	1	1.6 %
Online communication, face-to-face, and school observation	12	19.4 %
Communication online, face to face, school observation, and others	3	4.8 %
Online communication, face-to-face, school observations, and the school website	13	21 %

Online communication, face-to-face, school observations, school websites, and others	2	3.2 %
Online communication and others	2	3.2 %
Online communication and school web	5	8.1 %
Online communication and observation to school	1	1.6 %
Online communication, observations to schools, and the school website	3	4.8 %
Online communication, observations to schools, school websites, and more	2	3.2 %
Face-to-face communication and school observation	7	11.3 %
Face-to-face communication, school observations, and the school website	8	12.9 %
Total	**62**	**100%**

When viewed from each method of obtaining data, the number and proportion of resource persons who used each method are as follows:

Table 4. How to Get Data (2)

How to Get Data	Amount	Percentage
Online communication	47	75.8 %
Face-to-face communication	46	74.2 %
Observation to school	51	82.3 %
school website	33	53.2 %
Other	9	14.5 %

Based on the Table 4, the most widely used method by students in obtaining data during *PLP* on School Environment was direct observation to schools, which was 82.3%, followed by online communication (75.8%) and face-to-face communication (74.2 %).

Platforms/Technology Applications Used to Obtain Information/Data Online

The online platforms/technology applications, used to get information/data needed by students from schools, were: 1) video conferencing (Zoom, Google Meet, and others); 2) telephone; 3) Whatsapp; 4) e-mail; 5) others. Each student obtained data from the school using one or more platforms/applications. The following is the data platform/application used by students to get data from schools by online.

Tabel 5. Platforms/Applications Used to Get Information (1)

Platform/aplikasi	Amount	Percentage
Video conference (Zoom, Google Meet, etc.)	2	3.2 %
Video conference (Zoom, Google Meet, etc.), telephone, Whatshapp	5	8.1 %
Video conference (Zoom, Google Meet, etc.), Whatshapp	26	41.9 %
Video conference (Zoom, Google Meet, etc.), Whatshapp, E-mail	5	8.1 %
Video conference (Zoom, Google Meet, etc.), Whatshapp, others	6	9.7 %

Telephone, Whatshapp	3	4.8 %
Telephone, Whatshapp, e-mail	1	1.6 %
Whatshapp	8	12.9 %
Whatshapp, e-mail	3	4.8 %
Whatshapp, others	1	1.6 %
Others	2	3.2 %
Total	**62**	**100%**

When viewed from each platform/application used, the number and proportion of students who used each platform/application are as follows:

Tabel 6. Platforms/Applications Used to Get Information (2)

How to Get Data	Amount	Percentage
Video conferencing (Zoom, Google Meet, etc.)	44	71 %
Telephone	9	14.5 %
whatsapp	58	93.5 %
E-mail	9	14.5 %
Other	9	14.5 %

Based on the Table 6, the most widely used platform/application by students in obtaining data during *PLP* on School Environment was WhatsApp (93.5%), followed by video conferencing (71%).

Reflection on Student Experience
Reflection was an important part of *PLP* activities. Students reflected on their experiences while carrying out *PLP* activities. This section describes research data in the form of student reflections on the experience of implementing *PLP* on School Environment by online. The results of the reflection were related to: a) the extent to which students comprehend the school culture, students, and the identity of teachers; b) the gained positive experiences; c) the inspiring experiences; d) the attitudes or values that developed in the individual students; e) intentions/plans in the future as a follow-up to the meaning that had been obtained, especially for self-development as a prospective teacher; f) problems/obstacles faced by students and how to overcome these problems.

Experience Knowing School Culture, Students, and Teacher's Identity
There were various ways that students did in gaining learning experiences while carrying out online *PLP* on School Environment, namely:
1. Interview with the Principal (A)
2. Interview with PLP on School Environment Coordinator at School (B)
3. Interviews with teachers (C)
4. Interview with administrative/administrative employees (D)
5. Interview with students (E)
6. Documents obtained from school (F)
7. Others (G)

The following table presents data on the proportion of students in each way of getting a learning experience in each type of experience.

Table 7. Proportion of Students in Each Way of Getting Learning Experience

No.	Type of Experience	Proportion of Students in Each Way of Gaining Learning Experience (%)						
		(A)	(B)	(C)	(D)	(E)	(F)	(G)
1	Recognize the implementation of the school's vision and mission	41.9	67.7	56.5	29	37.1	90.3	8.1
2	Recognize the school organizational structure	40.3	66.1	38.7	30.6	12.9	83.9	6.5
3	Recognize the implementation of school rules and regulations	35.5	67.7	64.5	29	45.2	66.1	11.3
4	Recognize the school achievements	22.6	61.3	53.2	21	25.8	85.5	6.5
5	Recognize the academic activities at school	22.6	64.5	62.9	14.5	46.8	59.7	12.9
6	Recognize the school network	21	69.4	51.6	27.4	9.7	46.8	9.7
7	Recognize the school's relationship with parents and the School Committee	16.1	69.4	51.6	21	17.7	21	9.7
8	Recognize the use of information technology in schools for learning, administration or communication	22.6	69.4	62.9	24.2	35.5	27.4	11.3
9	Recognize the peculiarities or good practices that appear in the school	32.3	64.5	59.7	16.1	35.5	40.3	9.7
10	Recognize the relationship between students	11.3	48.4	54.8	11.3	72.6	11.3	14.5
11	Recognize the development/characteristics of students at school	9.7	51.6	66.1	4.8	53.2	25.8	6.5
12	Identify problems that students usually encounter	6.5	48.4	67.7	6.5	62.9	11.3	9.7
13	Know the information about teacher attendance in schools and classes	22.6	62.3	56.5	17.7	12.9	37.1	11.3
14	Recognize the relationship between teachers and students and colleagues	17.7	61.3	69.4	19.4	54.8	11.3	8.1
15	Recognize the involvement of teachers in scientific activities, and professional associations	19.4	58.1	64.5	9.7	8.1	29	6.5

To obtain data from reflections on experiences in understanding school culture, students, and the identity of teachers which are formulated in the learning outcomes of *PLP* on School Environment courses was done by giving 15 questions to students. These questions were intended to determine to what extent students experienced in school in understanding school culture, students, and teacher identity. Each question provided 5 alternative answers measured in Likert scales. The following table presents the results of scoring and interpretation of student experience data in PLP on School Environment courses, based on Benchmark Reference Assessment or LAP Type II.

Table 8. Interpretation of Student Experience Data

Score range	Criteria	Frequency	Percentage
X > 63	Very good	10	16.1
54 < x ≤ 63	Good	38	61.3
48 < x ≤ 54	Enough	7	11.3
42 < x ≤ 48	Not good	5	8.1
x ≤ 42	Not very good	2	3.2
		62	100

The Table 8 shows that 16.1% of students are in the very good category, 61.3% of students are in the good category, 11.3% of students are in the moderate category, 8.1% of students are in the poor category, and 3, 2% of students are in the very poor category, in getting to know school culture, students, and the identity of teachers. Thus, it can be concluded that the experience of most of the students participating in *PLP* on School Environment is in the good category in recognizing school culture, students, and teacher identity.

Good Experiences Gained by Students During Implementing PLP School Environment

There were various good experiences that students had in PLP on School Environment courses. Broadly speaking, the good experiences experienced by students are summarized as follows:
1. Students could understand the school environment through interviews, documents, and photos, even though it was done online. Some students could get to know the school environment through direct observation, even though they did not meet with students.
2. Students understood more about school culture, student characteristics, educator identity, the meaning of the vision and mission of a school, school structure, school system, implementation of school rules and management which were quite complex
3. Students experience were perceived well and sincerely by the school. Teachers and employees were very friendly, open, and informative in providing the required data.
4. Students gained new things, valuable and enjoyable experiences, and inspiration through interviews and interactions with teachers, employees, and students, and gained deeper understanding of the teaching profession so that they were helped in preparing themselves to become teachers who could be an inspiration to others. Students also became more and more confident to become teachers.

5. Students gained experience in establishing relationships, communicating effectively and collaborating (long distance) with the school (principals, teachers, staff, and students) and fellow students, and lecturers, thereby improving public speaking skills which were useful as prospective teachers.
6. Students had experiences in participating in school activities.
7. Students knew the school's performance, obtained a lot of information and new insights about the process and ways of educating and managing schools.
8. Students improved their ability to work together in groups, because they were in different locations, some in Yogyakarta and some outside Yogyakarta.
9. Students increasingly understood the duties of each school member, the activities of educators, and the role of teachers in addition to their main task of teaching students. Students could also observe how school members work together to run school organizations.
10. Online *PLP* School Environment provided an interesting experience for students as prospective teachers for future preparation.
11. Students understood the "ups and downs" of teachers, the concerns and challenges faced by teachers and students, how to overcome various problems that arise in carrying out online learning. Teachers were still trying to get their students to take part in online learning activities.
12. Students gained experience in practicing patience.

Inspirational Experience Gained from Implementing PLP School Environment

There were various inspiring experiences that students gained through *PLP* on School Environment courses, most of which were conducted online. Broadly speaking, the inspiring experiences experienced by students are summarized as follows:

1. Students felt the fighting spirit of the teachers with tenacity, sincerity, and patience. They continued to work professionally and tried to teach as best as they could, even in the midst of pandemic and some limitations. Teachers were also happy and enthusiastic to make visits to students' homes, boarding houses, and dormitories to provide motivation and teaching to students.
2. Students found that teachers were always willing to develop their potential by participating in various kinds of activities as support so that they could teach according to the times.
3. There was a strong desire from students to become teachers who can be close to students.
4. Students admitted that students at schools were still enthusiastic in carrying out online learning. They realized that sometimes they felt lazy to take online lectures.
5. Students were impressed by the school's ability to manage teaching and learning activities during the pandemic. All school personnel looked ready to face the pandemic. Facilities such as hand washing stations and new lesson plans were ready for use.
6. Students obtained experience from teachers about the difficulty of teaching during a pandemic, which was very different from the period before the pandemic. For example, the responses of students who were not communicative, tended to only be silent readers in the group, the answers to assignments that

were collected were the same as several students, and the limited data quota for students due to the uneven distribution of quota from the government.

7. Students admitted that it could be fun to be a teacher in a good school environment.

8. Students were impressed with the actions taken by the school to help students who had limited technology and internet networks to participate in learning. For example, the school took the initiative to establish poskos in every sub-district in Ketapang district to distribute tasks to every student in the interior/village.

9. Students were impressed by the 5S culture (smiles, greetings, greetings, politeness, manners) that the school does. This was evident from the students who always greeted the teachers before entering school, and the daily prayer activities.

10. Students had the experience that said "Nothing is impossible as long as we are willing to try. Even though the conditions are not possible, but if we are willing to try, we will get good results".

11. The experience of the discipline of the entire school community, the excellent interaction of teachers, employees, and students had made the school atmosphere more lively, and learning comfortable.

12. Students found the commitment of teachers in carrying out learning, which could be seen from the fact that no teacher was late when starting online classes, and senior teachers were willing to learn technology in order to be able to teach during the pandemic.

13. Students found an idea of a good teacher or favorite teacher, namely a teacher who could teach in a friendly, patient, kind, sincere heart, supports students' interests and talents.

14. Students had experiences from teachers, in which teachers could position themselves as teachers as well as friends for students. There were times when the teacher had be firm and wise in teaching in class (academic) and guiding students. However, they could still be friends who always supported for the character development of the students (non-academic). In addition, school principals, teachers, staff and employees also provided examples of discipline, namely being on time and being present for morning prayers. They put God at the top priority before carrying out activities and there are words of motivation that become a reference in carrying out activities.

15. Students had experiences from the teacher that when students were less interested in the material presented, the teacher had to continue to carry out their duties and try to understand how students learned so that they could convey the material well.

16. Students gained experience that as a teacher, it was very necessary to know the characteristics of students, such as students' backgrounds (physical, psychological, socio-economic and academic progress), because they greatly affected the progress of learning at school. Based on the results of the interviews, the teacher knew students well and were able to deal with various characteristics of different students. A teacher had to treat students according to their needs. Therefore, as a teacher, they had to learn to understand students and choose the right way to deal with students.

17. Students gained the experience that a teacher should try to create a pleasant learning atmosphere so that students could catch the learning material well. Teachers had be able to adjust learning conditions in case of sudden changes.
18. Students gained experience about the importance of the value of cooperation and mutual respect.
19. Students admitted that, as a teacher, they had to pay attention to many things when making a policy.
20. Students admitted that teachers and school staff had a huge responsibility in schools, and that building relationships in schools is very important.

Meanings/values Gained from Inspiring Experiences

There were meanings/values that developed in the individual students from the inspirational experiences gained during carrying out PLP School Environment. Broadly speaking, these values are summarized as follows:

1. Values of respecting others, respect, persistence, cooperation, mutual help, commitment, patience, kinship, responsibility, hard work, mutual help, mutual respect, discipline, optimism, perseverance, tolerance, good communication, thoroughness, honesty, solidarity, never give up, helping without choosing, spirit to move forward, innovative, more creative in finding information with limited resources.
2. Values of how to place yourself, divide your time well, being open to knowing the characteristics and situations of students, and willing to build good relationships with students' co-workers.
3. The value that, regardless of the conditions, must remain devoted wholeheartedly, must provide the best for students and be a role model for students. On the other hand, as a good teacher, he must learn to enter the world of students or in other words take a more specific approach so that the school's goal of creating a quality person is achieved.
4. The value of being open (more open) and sensitive to many things around us, keeping the spirit in various limitations.
5. The value that, even in any difficult situation, obligations are still obligations, keep moving forward even though obstacles befall us, and as long as we try, there must be a way.
6. Values of the importance of preparing for the future, deepening education in order to become a competent teacher, working hard in order to transfer knowledge well.
7. The value that being part of the school must be ready under any circumstances. In this pandemic period, where there is a limited distance in learning activities, teachers should be able to adapt to the current situation.
8. Discipline value, is the main component of a person in the process or offer and will produce a quality person.
9. The value of women's emancipation: Sometimes many people still think that women are not comparable to men and men are more deserving of education than women, in fact women are also comparable to men who are able to balance what men can do, for example in terms of achievement.
10. The value that a good teacher not only provides material but also understands the character of students; adapts to many student characteristics; gives more

emphasis on respect to students either as a person or their learning processes; and guides students according to their needs.

11. The meaning that being a teacher means a journey in the progress to become better in life. Teaching is a job that requires a willingness to be a lifelong learner.

12. The value that sincerity in helping others will be very visible and has an impact on others.

13. The enthusiasm of educators still radiates even though learning activities are happened by online. The teachers continue to provide the best service to their students.

14. There is a desire from students to mentally prepare themselves to face students in the future, because in the future students may have different emotional and thinking patterns, one of which is the effect of this pandemic, so it is necessary to mentally mature so that they can become teachers who can be "*digugu*" (Javanese) or imitated.

15. The meaning that being a teacher is not easy, because they have to pay attention to their students, and at the same time maintain their career.

16. The meaning that the success of a school is not only seen from the physical and financial aspects, but also from the dedication and high concern of the school to the students.

Future Intentions/Plans for Self-Development as a Pre-service Teacher

The future intentions or plans expressed by the students as a follow-up to the meanings that have been obtained, especially for self-development as prospective teachers, are summarized as follows:

1. As prospective teachers, students would try to be the right example for students as best they can and work wholeheartedly in accordance with the vision and mission of the school where they work, always updating their skills and knowledge so that when teaching they can give the right things for the students.

2. Students wanted to become teachers who are professional, creative, innovative, and try to adapt to the existing culture, changes, patient and friendly to students, can understand students, responsible, open to students, active, and humanist, liked by students (not a teacher who is feared but respected), can build close relationships with students, teachers who really explore their roles and try their best in carrying out their duties.

3. Students intended to become wise teachers, would always adapt to existing situations and conditions, be disciplined, explore the field or material they are concerned in, learn to control emotions, care more to the students, and have an open mind.

4. Students intended to study harder to prepare themselves as well as possible to become good, qualified/competent teachers, able to manage classes, understand the different characteristics of other people; trying to always help others and develop self-character/personality in order to be a good role model for students.

5. Students wanted to be more patient in dealing with all situations and accepting circumstances, developing students' interests and *talents* (non-academic), and shaping students' better characters.

6. Students would be more innovative, especially in terms of learning media because of the development of science and technology so that students are more enthusiastic in learning.
7. Students wanted to try to understand the materials for teaching, develop in recognizing the characteristics of other people, try to be able to manage time well, and build good relationships with every one.
8. Students tried to be optimistic that they would be able to overcome the challenges in teaching as long as they would be willing to try and give their best.
9. Students wanted to become good and professional teachers by applying kinship values in teaching, making good relationship with employees at school, obeying school rules, not being arbitrary to students, and empathizing with others.
10. Students would learn more about learning psychology and human psychology so that they could carry out learning well and students would get something valuable.
11. Students would create interesting learning activities for students so that they could stimulate students to be motivated in learning.
12. As prospective teachers, students wanted to have patience, able to find solutions to problems, understand problems faced by students, try to help students follow the lessons well and meaningfully, and explain the materials clearly and understood by the students very well.
13. Students wanted to take the opportunity to learn to be educating volunteer in teaching communities.

Constraints/Problems Faced When Implementing PLP on School Environment and How to Overcome Them

The following summarizes the various problems faced by students while carrying out PLP on School Environment and how to overcome them.

Table 9. Problems Faced by Students and How to Overcome Them

No.	Problems	How to Overcome
1.	Difficult internet network, internet connection that was not smooth/unstable, especially when using video conferencing (eg: Zoom, Google Meet) which required a lot of quota.	1) Find a suitable place and time to get a strong signal. 2) Look for free wifi or hitch a ride at a neighbor's house. Buy a card from a provider that has a strong and inexpensive network. 3) Asking the school's permission to come and make observations to the school directly. 4) Cooperate, communicate and help each other with other group members.
2.	Information/documents obtained from schools were incomplete and inaccurate, because the communication was not optimal.	1) Look for supporting data on the school's website and also monitor the school's social media accounts. 2) Share tasks with some friends to find data from the school, especially the PLP on School Environment coordinator at the school.
3.	Lack of understanding of students at school because there was no direct interaction with students, as	1) Make a questionnaire in the form of a google form which is then distributed to students. Ask the tutor for help and wait.

	well as difficulties in contacting students, observing and interviewing students directly because of the pandemic.	2)	Share information with other friends.
4.	Difficulty in communicating and coordinating with group mates, especially friends from other study programs and friends outside Java, causing misunderstandings among students which sometimes hindered the smooth running of *PLP* activities.	1) 2) 3)	Often ask other friends and respond immediately if there are questions through the group and try to always hold the cellphone. By discussing and collaborating with friends to solve existing problems. Try to be patient and try to communicate via WhatsApp group
5.	Students had difficulty in communicating with the supervising lecturer (long response), causing lack of guidance and direction from the supervisor.	1) 2)	Discuss with friends in the WA group about the problems they faced. Frequently contact the supervisor.
6.	It was difficult to adjust the schedule for online interviews with teachers, principals, and students because at that time they still had their own duties, and some teachers worked from home (WFH) and some at school.	1) 2) 3) 4)	Discuss with friends in the same group and communicate with the PLP on School Environment coordinator at the school and the supervising lecturer. Contact the school, such as teachers or staff, so that they can assist in collecting data. Make sure before coming to school to meet the teachers so that they can meet. Contact resource persons and adjust the schedule again, as well as studying the provided documents .
7.	Difficulty in contacting/ communicating with the school (teachers and employees), and lack of intensity in meeting with supervising teachers, for example slow responding due to busyness, so that it became an obstacle in getting data. In addition, long distance communication also made it difficult for students to get complete information.	1) 2) 3) 4) 5)	Try to communicate with the supervising teacher through the WA group and finally being able to overcome the problem. Wait for an answer from the teacher and looking at the school's website Request data in enough span of time Maintain good communication between friends in a group, and still respect each other's busyness. Consult with the supervisor.
8.	Because the PLP on School Environment was done by online, the data obtained were incomplete and there were not many opportunities to see directly the condition of the school.	1) 2)	Conduct online interviews and distribut questionnaires to students. Try to get school-related information from other friends and discuss with group friends or with teachers online.
9.	Students who were not in Yogyakarta could not get directly involved in interviews with teachers or students.	1) 2)	Job distribution: They prepared reports and analyzed the results of interviews, as well as documents provided by other friends. Communicate with friends to get the information needed.

		3) Try to help when friends in Yogyakarta had difficulties.
10.	Difficulty in analyzing the situation of students/student relationships with teachers because they did not meet them directly.	Ask a lot of questions, observe more details and listen carefully to the information given.
11.	There was miscommunication between students and students, students and the school, as well as students and supervisors.	1) Discuss with friends and wait for information from the school. 2) Immediately contact the party concerned to ask for an explanation and/or provide an explanation regarding the topic at the root of the miscommunication.
12.	Difficulty in determining what activities should be carried out on the first day of PLP implementation.	Ask the supervisor and discuss with the group
13.	There were students who were not motivated to carry out *PLP* online so that these students did not want to try to work very well. Meanwhile, other students had been trying hard to find data from schools. This disturbed the psychological condition of other friends and the efficient completion of *PLP* activities.	Speak carefully to students who were not motivated to take PLP, and could finally be invited to work together. Meanwhile, friends who had been trying hard to find data, consult reports, ask for signatures, and submit reports to school, motivated themselves that what they were experiencing now would be a useful in the future.
14.	Lack of insight into the ins and outs of schools, and lack of an overview of school conditions because PLP was not carried out directly.	Ask the school's permission to come and make direct observations in school.

Discussion

From the results of reflection on student experiences in understanding the school environment which includes: school culture, students, and teacher identity in the online *PLP* School Environment implementation, it shows that students could understand the school environment in accordance with learning outcomes in *PLP* School Environment courses. This can be seen from the reflection scores obtained by the questionnaire, indicating that most of the students were in the good category. This can be interpreted that although *PLP* on School Environment was mostly conducted by online, in general it can be said that the learning process could still take place well.

Reflection activities are integrated in the *PLP* course, helping students in interpreting every experience they experience, so that they can form new abstract conceptualizations. In this case reflection is an important process in supporting learning through experience. According to Wurdinger & Allison, the learning process occurs when a person goes through experiences, reflects on them, and forms concepts that can be applied to future experiences. According to Kolb's theory, reflecting on experiences allows one to make connections between experiences and

theoretical concepts that can then help refine and enhance similar future experiences. Living an experience without reflection leaves the learning that occurs (Wurdinger & Allison, 2017).

Reflection activities are not only needed in the learning process of prospective teacher students through apprenticeship programs, but are also still needed in the professional development of teachers. Personal development, as part of professional development, is often done through reflective activities. Teachers as active participants in learning are encouraged to carry out professional development through reflective practice. This focus on reflection and active participation in professional development is theoretically supported by experiential learning theory (Girvan, Conneely, & Tangney, 2016). Reflection on action as a key tool for professional development has been used both as a tool for self-direction (Minott, 2010), and to develop understanding and practice through sharing experiences (Girvan et al., 2016). In the development of teacher professionalism, the application of experiential learning has been widely carried out. The focus is on teachers' experiences in developing learning practices in the classroom, teachers experimenting, reflecting on, and adapting new theories, practices and content to suit their contexts.

The positive experiences that students get, and the obstacles they face, as well as the values and attitudes that develop within students during the implementation of PLP School Environment, help students prepare themselves as prospective teachers comprehensively. All experiences experienced and reflected by students become new knowledge that can be useful in the next learning process as well as when they become teachers. As revealed by Chen at al. (2011) that internship activities help familiarize apprentices with practical skills, improve social relationships, motivate future learning, and develop socially acceptable personalities.

Various obstacles that are actually faced by students with the Covid-19 pandemic, have indirectly trained students to solve new problems that they have never experienced. This kind of experience actually plays a role in enriching students' knowledge and skills. This is in accordance with what was conveyed by Wurdinger & Carlson, that experiential learning also prioritizes the application of direct learning principles, using problem solving processes, overcoming real problems, encouraging social interaction and interaction with content, and using several subjects in an interdisciplinary manner (Wurdinger & Allison, 2017).

Students also find many inspirational experiences while conducting PLP School Environment online. The experience is certainly a meaningful and memorable experience for students, which can stimulate the emergence of positive intentions that are beneficial for their personal development as pre-service teachers. Experiential learning provides authentic real-world practice through situations students experience (they can see the consequences of their or others' actions) and authentic, real-world feedback from employers that encourages further learning (Ambrose & Poklop, 2015). Thus, Kolb's Experiential Learning Theory, has great potential in the educational environment and the ability to improve the teacher education process (Clark, Threeton, & Ewing, 2010).

Conclusion

PLP courses as a form of implementing experiential learning are intended to provide direct experience to prospective teacher students in order to understand the world of schooling and develop their competencies as a whole so that they have adequate provisions when they enter the world of education as a teacher.

During the Covid-19 pandemic, *PLP* was carried out online, so most students could not get hands-on experience at the school where *PLP* was implemented. Interaction of students with supervising teachers and students is done remotely. This practice is less than ideal for *PLP* courses which are field practice courses.

The data obtained from the students, in the form of reflections on their experiences while carrying out *PLP* School Environment, shows that although *PLP* was mostly carried out online, students could gain experience in getting to know the school environment well. Various good experiences, experiences of overcoming obstacles that arouse due to the pandemic, the development of positive meanings and values also complemented and enriched student learning experiences in *PLP* School Environment courses. Inspirational experiences were also experienced by the students, thus giving rise to positive intentions for self-development that were useful for them and while undergoing the profession as a teacher. Thus, the learning cycle in experiential learning theory, namely from concrete experience, reflective observation, abstract conceptualization, and active experimentation were experienced by students who conducted *PLP* School Environment, which was mostly carried out online.

References

___. (2020a). *Pedoman pelaksanaan PLP*. Yogyakarta: FKIP Universitas Sanata Dharma Yogyakarta.

___. (2020b). *Pedoman PLP lingkungan sekolah daring*. Yogyakarta: FKIP Universitas Sanata Dharma Yogyakarta.

Ambrose, S. A., & Poklop, L. (2015). Do students really learn from experience? *Change: The Magazine of Higher Learning*, *47*(1), 54–61. https://doi.org/10.1080/00091383.2015.996098

Capinding, A. T. (2021). Analysis of learning and academic performance of education students Before and during the coronavirus disease pandemic. *European Journal of Educational Research*, *10*(4), 1953–1962. https://doi.org/10.12973/eu-jer.10.4.1953

Chen, C. T., & Chen, C. F. (2011). The influence of internship experiences on the behavioral intentions of college students in Taiwan. *Asia-Pacific Education Researcher*, *20*(1), 73–92.

Chen, C. T., Hu, J. L., Wang, C. C., & Chen, C. F. (2011). A study of the effects of internship experiences on the behavioural intentions of college students majoring in leisure management in Taiwan. *Journal of Hospitality, Leisure, Sport and Tourism Education*, *10*(2), 61–73. https://doi.org/10.3794/johlste.102.294

Cheong, A. L. H., Yahya, N. binti, Shen, Q. L., & Yen, A. Y. (2014). Internship experience: An in-depth interview among interns at a business school of a malaysian private higher learning institution. *Procedia - Social and Behavioral Sciences*, *123*(1995), 333–343. https://doi.org/10.1016/j.sbspro.2014.01.1431

Clark, R. W., Threeton, M. D., & Ewing, J. C. (2010). The potential of experiential learning models and practices in career and technical education & career and technical teacher education. *Journal of Career and Technical Education*, *25*(2), 46–62. https://doi.org/10.1007/978-3-642-77393-8_18

Filiz, B., & Durnali, M. (2019). The views of pre-service teachers at an internship high school on pedagogical formation program in Turkey. *European Journal of Educational Research*, *8*(2), 395–407. https://doi.org/10.12973/eu-jer.8.2.395

Girvan, C., Conneely, C., & Tangney, B. (2016). Extending experiential learning in teacher professional development. *Teaching and Teacher Education*, *58*(May), 129–139. https://doi.org/10.1016/j.tate.2016.04.009

Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education*, *4*(2), 193–212.

Kolb, A. Y., & Kolb, D. A. (2017). Experiential learning theory as a guide for experiential educators in higher education. *ELTHE: A Journal for Engaged Education*, *1*(1), 7–44.

Kolb, D. A., & Boyatzis, R. E. (1999). *Experiential learning theory: Previous research and new directions*. https://www.researchgate.net/publication/284458870_Experiential_Learning_Theory_Previous_Research_and_New_Directions_in_in_Perspectives_on_Thinking_Learning_and_Cognitive_Styles

Mahyoob, M. (2020). Challenges of e-learning during the COVID-19 pandemic experienced by EFL learners. *Arab World English Journal*, *11*(4), 351–362. https://doi.org/10.24093/awej/vol11no4.23

Minott, M. A. (2010). Reflective teaching as self-directed professional development: Building practical or work-related knowledge. *Professional Development in Education, 36*(1-2), 325–338. https://doi.org/10.1080/19415250903457547

Nariman, D. (2021). Impact of the interactive e-learning instructions on effectiveness of a programming course. *Advances in Intelligent Systems and Computing, 1194 AISC*. Springer International Publishing. https://doi.org/10.1007/978-3-030-50454-0_61

Ngabiyanto, Nurkhin, A., Mukhibad, H., & H. (2021). E-learning evaluation using general extended technology acceptance model approach at schools in Covid-19 pandemic. *European Journal of Educational Research*, *10*(3), 1171–1180. https://doi.org/10.12973/eu-jer.10.3.1171

Permenristekdikti Nomor 55 tahun 2017, (2017).

Purwadi, Saputra, W. N. E., Wahyudi, A., Supriyanto, A., Muyana, S., Rohmadheny, P. S., Ariyanto, R. D., &, & Kurniawan, S. J. (2021). Student perceptions of online learning during the Covid-19 pandemic in Indonesia: A study of phenomenology. *European Journal of Educational Research*, *10*(3), 1515–1528. https://doi.org/10.12973/eu-jer.10.3.1515

Sahoo, B. P., Gulati, A., & Haq, I. U. (2021). Covid 19 and challenges in higher education: An empirical analysis. *International Journal of Emerging Technologies in Learning*, *16*(15), 210–225. https://doi.org/10.3991/ijet.v16i15.23005

Stirling, A., Kerr, G., Macpherson, E., Banwell, J., Bandealy, A., & Battaglia, A.

(2017). Do postsecondary internships address the four learning modes of experiential learning theory? An exploration through document analysis. *Canadian Journal of Higher Education*, *47*(1), 27–48.

Sugiyono. (2018). *Metode penelitian kuantitatif*. Bandung: CV Alfabeta.

Wismawarin, B. (2020). *Pembelajaran daring di masa pandemi, solusi atau masalah?*. IAP2. https://iap2.or.id/pembelajaran-daring-di-masa-pandemi-solusi-atau-masalah/

Wurdinger, S., & Allison, P. (2017). Faculty perceptions and use of experiential learning in higher education. *Journal of E-Learning and Knowledge Society*, *13*(1), 27–38. https://doi.org/10.20368/1971-8829/1309

Zhou, M., & Brown, D. (2017). Educational learning theory. In S. Dijkstra, F. Schott, N. Seel. R. D. Tennyson, N.M Seel (Eds.). *Instructional Design: International Perspectives I* (1st ed.). London: Routledge. https://doi.org/10.4324/9780203062920-11

THE IMPACT OF COMPUTERIZED EXAM FEATURES, EFFECTIVE EXAM IMPLEMENTATION, TOWARD STUDENT SATISFACTION

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Abstract
This paper intends to examine in detail the relationship between computerized exam features and effective exam implementation toward student satisfaction. The main goal is to examine the synergistic relationships which impacting student satisfaction after they using a computerized standardization exam in the college setting. Design/methodology/approach –an initial exploratory analysis was conducted methodically to confirm the proposed model through a structural equation modeling approach. The computerized exam features (especially, clear wording instruction and exam rulebook) had high effects on student satisfaction. Secondly, Effective Exam implementation (especially, efficient effort, time and cost) also impacted student satisfaction. Thirdly, the statistical testing result confirmed a joint impact of computerized exam features and effective exam implementation toward student satisfaction. The conceptual model has been validated to understand the role of both variables toward student satisfaction. However, there is lack of empirical validation and generalization of the model into wider scope due to limited time of research and a small number of the participant which suggest future research.

Keywords: computerized exam features, effective exam implementation, student satisfaction

Introduction
There are two types of exams. Firstly, a paper based exam which delivered through paper sessions and classroom face-to-face meetings. Secondly, the computerized exam used by technological supports with computer facilities. Many colleges have implemented computerized standardization exams to improve their education results (Moser, et al., 2015). However, the exam quality is rarely to be assessed from student perspectives. The issues bring us to observe further methodically and in detail about the constitution or structure of the exam process and its benefit to the students, especially the computerized exam typically for purposes of education and exam goal (Meier & Knoester, 2017; Flynn & Featherstone, 2017). Therefore, we need to analyze the benefit of the exam and how the exam implementation more clearly from the student position.

As education competition is increased, a trend of implementation of the standardization exam is been raised. However, implementing such an exam method in a multicultural school is still debatable. On the first hand, as schools accepting many students they have to facilitate the students with adequate services. Technology has been offered to provide such services with challenging tasks (Tidd & Bessant, 2018; Strayhorn, 2018). On the other hand, there is increased complaints about the integration of technology into educational services. There are opportunities from the growth of educational technology systems such as the adoption of eLearning, computerized exam, and administration management system in many colleges (AlAzawei et al., 2016; Trelease, 2016). However, their benefits to the students are still rarely inspected.

Some reports have indicated that such technology has visible weaknesses such as lack of clear wording instruction, misunderstandable questions, and unfair exam rulebook (Skinner, 2016). Even though many colleges have provided assurance and guarantee of the technology adoption for their education service (Johnson, et al., 2016), however, many critics and complaints have still occurred especially from their users (eg, students). Therefore, providing computerized exams and measuring its exam quality from student's perspectives are challenging efforts (Debuse & Lawley, 2016).

The system quality of the computerized exam also contains issues of low student satisfaction (Napitupulu, et al., 2018; Horvat, et al., 2015). Such issues can be divided into two types, eg, clear working instruction and timing schedule. For clear working instruction, there is a debatable result about how computerized exam can help the exam participants to understand the exam instruction (Smith, et al., 2019). Thus, there is an issue that the question instruction of the computerized exam is sometimes given problem and difficult to be understood by the student since it contains a technical term. Such an issue can prevent the development of a social cognitive aspect of the students (Bjorklund and Causey, 2017).

For the timing schedule, there is a difficulty faced by the exam participants since they have very tight time to finish the exam. Such lack of time in exam timing impact on the student perception that the exam is unfair (Bottiani, et al., 2017). Such an issue leads to a gap to find the scale of fair timing toward student satisfaction. However, developing a new scale to measure student satisfaction toward the exam is challenging because it needs modeling and testing.

Research De Marco and Broshek, (2016) showed that computerized exams have more benefits than weaknesses. However, understanding the process of how the user getting the benefit is often challenging because it has a complex process. From the user side, we have to understand how the user will perceive the exam's usefulness, ease of use and acceptance of information technology (Moridis, et al., 2018).

There is a debatable definition and construct of exam effectiveness from its dimension (e.g., effort, time and cost) (Yu, 2016). In many studies, these three types of constructs are often examined separately (Hwang, et al., 2016; Apugliese & Lewis, 2017). This separation has an impact on the difficulty to know the integrative relationship between the three constructs. Such confusion leads many scholars to put the exam effectiveness as dependent variables so than an independent variable. Therefore, it is important to evaluate how the satisfaction will fit with the context of the computerized exam system.

By evaluating the effectiveness of the system, it can be seen that the exam potentially affects student satisfaction (Hanus & Fox, 2015; James & Casidy, 2018). However, such satisfaction is often ignored by satisfaction scholars, especially its impact on student anxiety in exam implementation. Thus, student distress in a web-based distance education course is often ignored, which impacted on their concentration and cognitive load during exams (Grangeia, et al., 2016). Thus, exploring the relationships between clear working instruction and student satisfaction is challenging tasks for some reason.

Firstly, an exam with good quality is indicated by adequate instructional and student acceptance (Nilson, 2016). Also, a good computerized exam system will shape self efficacy and self-regulated effort among the student to improve their development (Bol, et al., 2016). Through self-regulated effort, students can maintain their response and error prevention promptly.

Secondly, from the programmer's perspective, they have to design and facilitate the exam system with adequate and powerful exam features (Romiszowski, 2016). They also have to provide a good system with the assurance of objectivity to support the student's interaction with the system. Such assurance improves the user's willingness to use the exam system since it increases user acceptance (Yang, et al., 2016). This means that a good system must provide accurate and fast results to be a predictor of student satisfaction. When students can answer exam questions and obtain a good response promptly and accuracy, the exam will be perceived as fair and consequently have an impact on student satisfaction.

Overall, some problems need to be addressed through this research. Although the computerized exam promises advantages of the accuracy of the test results and the efficiency of cost and manpower, it also has weaknesses because the system is complex to be understood by an unexperienced user (Malik & Khan, 2016). Such complexity can shape the perception and satisfaction of students toward the exam system. This problem will increase if there are technical problems such as power outages, programs, and computer equipment during the exam (Card, 2018). These problems will cause prospective graduates to feel disadvantaged due to the limited time so that it might affect their satisfaction. Therefore, this study will examine the relationship between computerized exam features and effective exam implementation toward student satisfaction with the population of STMIK SWADHARMA students.

Previous studies Holinka (2015) revealed a significant number of causes of student satisfaction. Through the adequate review, two main factors are impacting the student satisfaction toward the computerized exam system (eg, exam features and effective exam implementation) (Permzadian & Credé, 2016). To understand the relationship and how they can impact on student satisfaction, it needs to clarify whether computerized exam features will effect on satisfaction. Furthermore, the synergistic relationship can be found among the effective exam implementation toward student satisfaction. Therefore, their relationships need to be investigated. Following the above explanation, the purpose of this paper is to investigate the effect of computerized exam features and effective exam implementation on student satisfaction. consequently, this paper will describe the synergistic relationship between the variables.

The proposed model will be tested using Exploratory Factor Analysis (EFA) (to uncover the underlying structure of variables) and Confirmatory Factor Analysis (CFA)(to refine the resulting scales in EFA). Each variable is divided into dimensions and constructs to determine the loadings of the measured variables and confirm pre-established theories. Therefore, a Structural Equation Modelling (SEM) approach is implemented.

This paper consisted of five main parts. The first part contains an introduction and problem background. The role of each variable is described and explained. The third part contains the research methodology, population, and the statistical testing approach. The result analysis and discussion are given in part fourth. Finally, the discussion, conclusion and managerial implications are also given.

Literature Review
Theories of Social Cognitive and Blended Learning

Scholars have studied the role of the social foundation of humans in their thought and action (McDougall, 2015). The human can improve their interaction with the environment through multifacets variables and constructs. However, measuring such constructs are complex and time consuming. By following Bandura's social cognitive theory, many scholars have focused on the methodological choices in studying student experience toward computerized exams as part of blended learning especially in higher education (Devi, et al., 2017; Connolly, 2017).

To get the best results student must understand how they will adapt and interact with the system. Practically, this means that the students should be fully involved in achieving the optimal result through their interaction with the system (Myers, et al., 2016). A student satisfaction may be one variable which also important to change or shaped the students to gain better performance.

For example, in a system with adequate interaction, the users can easily develop interaction and establish their responsibility to achieve student satisfaction (Yilmaz, 2017). Thus, a good system must have the ability to establish an organizational atmosphere to facilitate others. They can be driven to be actively engaged with the system collectively in the achievement of the exam score.

Researchers have used various perspectives to understand the cause of high student satisfaction. These include the theory of social cognitive and theory of blended learning in higher education. A theory of social cognitive theory is a conceptual paradigm that influencing studies of human behavior in the education environment (Whiteside, 2015; Harasim, 2017). The theory becomes the social foundation of interaction between students and the environment to shape their thought and action. For example, a good exam system can provide interaction that supports the student (user) to finish the exam since it has clear wording instruction. The theory is based on the determinant of interaction that will result in agreement or rejection about the exam system (Wampoid, 2015). If a student can interact better with the system, the interaction will be repeated or continued. Based on the relationship between the social exchange theory, a system designer can add a computerized exam with higher interaction features to increase student satisfaction. From both theories of social cognitive and blended learning, there is a research focus and methodological choice in studying the student's experience about the

blende learning in both theories have been implemented and expected to provide a positive relationship between the exam system quality toward student satisfaction for at least two reasons (Jones & Alba, 2019; Oliver, 2017). First, students' perception of exam theory can lead to a higher benefit for the students. Secondly, such benefit is given as education institution supports which then increases the interaction of the student with the system. These attributes could translate into important behavior adapted by the students to achieve a higher score and frequent action.

After reviewing the related literature, this study proposed three variables which expected to be inter-correlated, e.g., computerized exam features, effective exam implementation, and student satisfaction. To do so, it is important to understand the direct and indirect impact of the exam features and exam implementation and finally the student satisfaction. The individual parts of the model are discussed below, and then the hypotheses of this study are presented.

Standardization exam

Exam standardization has been trending among favorite colleges as an approach to adopt technology and educational process to provide high level education goals in the sense of the future community and help students to understand and respond positively to the personal future (Rangel and Coulson, 2017; Calderón, et al.,2019).

The standardization exam aims to identify the skills possessed by students as a requirement of passing the education level (DarlingHammond, 2015). The exam can be computerized as a collaborative tool for testing student competence through the transparent process (Shoemaker, et al., 2017). A good exam can help the students to do an effort to finish the exam. Such a process will create student received usefulness, perceived ease of use and user acceptance of the exam system quality.

Computerized standardization exam system

Recent research shows that the standardization exam has been integrated with technology to support students' interest in using computers in the college environment (Rashid & Asghar, 2016; Sung, et al., 2016). However, the success of the computerized technology based standardization exam still raises questions for the dependent variable, especially regarding the form of the test it can provide the results desired by its users (i.e., students).

Current research on examinations with systems tends to produce the desired results. However, it is difficult to explain how to design and evaluate the quality of the exam system to support student needs (Dennis, et al., 2018; Rowntree, 2015). Although some views show that a good system must be flexible and conducive to provide effective solutions to problems students face during the exam.

Some studies propose a model of measuring system user satisfaction exam system with satisfying results (Halpern, et al., 2016). It is considered that the exam system is very effective in increasing student scores. There are several important features of a quality system, that is, the system has powerful and powerful test procedures (Johansen, et al., 2015). Then, the system supports the system and provides optional computerized options.

Student satisfaction

Student satisfaction is a complex, multidimensional factor for which a global and unidimensional definition is still arguable and debatable. Regarding the definition of student satisfaction, it means that the variable must be measured from the student perspective, it also presents biased expectations, while also incorporating multifaceted dimensions such as system quality to measure the satisfaction level (Annamdevula & Bellamkonda, 2016).

Scholars have defined the debatable meaning of student satisfaction. In this paper, we synthesized many theories and defined the student satisfaction as a situation where students are pleased with their experiences in a virtual exam environment, including interactions with the system, features, and instruction (Lee, et al., 2017). If the system quality matches their expectations and provides support services, there is a tendency a higher student satisfaction.

Even though student satisfaction has been previously used by many authors (Turner and Briggs, 2017; Napitupulu, et al., 2018; Yilmaz,2017). The variable is derived from a scholar's perspective. Student satisfaction is still the area of psychology that lack matches criteria and definition to confirm its constructs. Therefore, the content validity of these items must be ensured. This means that establishing a validated scale important by comparing the terms of validity and reliability is important. Therefore, the student satisfaction must use the same scale was adopted by (Harrati, et al., 2016) and tested for its content validity, construct validity and reliability.

For example, in the exam system, satisfaction is the level of student's feelings after comparing the performance or the exam system results they experience toward their expectations. Following Ladhari, et al., (2017) satisfaction is a function of the difference between perceived performance and expectations. If the system performance is below expectations, disappointment arises. Student satisfaction will increase if the system performance is as expected. If the system performance exceeds the expectation, then, the student will be very satisfied. Thus, the student's expectations will be shaped by past experiences, comments from acquaintances or relatives, and the promises and information of the school. Satisfied students will make good comments about the exam system. To test both hypotheses, we propose a conceptual model (see Fig.1).

Computerized exam features

Considering the importance of the features that must be owned by a system, then we deepen through a review of this literature. Research Tarhini, et al., (2017) showed that user satisfaction was increased after using the exam system in developing countries. In the previous study, a good exam system quality is indicated by the ability of the exam system to prevent errors in answering the wrong questions. Besides, the exam system can improve self efficacy for self-administered exam forms. The exam implementation has increased the student score through the web based exam (Balta, et al., 2018). On average, students as the users have high satisfaction after participating in the exam because the system works well.

Several studies provided additional support to facilitate learning in web-based environments (Wang, et al., 2017; Rahimi, et al., 2015). The results showed that computers can shape human behavior during exams. On average the participants felt that the exam was in line with their expectations (Hanus & Fox, 2015). Some

recent evidence shows that a quality exam system can improve education management and ultimately deliver test results more quickly and accurately. Thus, a complete system feature can be a predictor of student satisfaction.

The students can internalize the need for the system features, devote their efforts to adapt toward the system deficiencies, and thereby achieve the goals of finishing the exam. Besides, they can provide feedback to evaluate performance, enabling the outcome of the quality of the system to be incorporated into the knowledge base after they finishing the exam (Dennis, et al., 2018). Beyond any doubt, the student must follow the procedures that are laid out in the exam instruction. Such instruction can be a driver of their perception and opinion after they experience the exam.

So, when the student is given the exam, they will try hard to finish the questions to provide the right answers. As students learn about the exam instruction and process, they also will get familiar with the features and their learning development is facilitated through the system features (Wlodkowski & Ginsberg, 2017).

The explanation above leads us to explore further the interaction that can play to drive student satisfaction. Student adaptation and familiarity toward the computerized system features will contribute to improved student satisfaction; generating new ability to finish the exam faster and working in a timely and effective way. Thus, the following hypothesis is proposed:

H1. Computerized exam features are positively related to student satisfaction.
Effectiveness of Use

Effectiveness of use has synonym with efficiency. It is a pattern of the desired result that is built to be systematic and as simple as possible, but complete and accurate. It also means a tight and strict procedure that can reduce errors. In a blended learning context, the effectiveness of use as attributes of student learning is recognized as an important factor of effective implementation of method efforts (Kintu, et al.,2017). For example, in exam implementation, the term represents efficient effort with scheduled time which adequate and right destination (McKnight, et al., 2016). It also concentrates on students being aware of and empowered to act on achieving the goal of the exam to resolve the tested questions through frequent interaction (Brock & Hundley, 2016). A student who has intensive engagement with the system will know better about their roles and goals. They will be aware of how to achieve the exam goals through such engagement. Through an active role in the system, they can develop and motivate themselves to improve the exam output.

The system has a role as equipment to achieve the goals set. If the chosen exam system is following the objectives set, then there will be a gradual achievement of these goals which will, in turn, be related to the effectiveness of the system's performance (De Boer et al., 2015). Thus, Cameron, (2015) distinguishes the effectiveness of performance in four approaches, e.g., achieving goals, system, constituency, and values.

Such effectiveness of use can be created through interaction with the system. Successful use of the system is an interaction that creating a bounded relationship between the system with the user and leads them to be motivated students (Bano &

Zowghi, 2015). After understanding the effectiveness of use, the effectiveness definition leads us to expose the role of student satisfaction.

Through the effectiveness of using the system, students will be satisfied, motivated and committed to response the system (Navimipour & Zareie, 2015). This means that the system with high effectiveness will predict positively related to student satisfaction. The engagement of students and the system can create a positive and conducive exam environment (Czerkawski & Lyman, 2016). If students are not involved in a good and effective environment and interaction, their satisfaction will be low. To determine the relationship between both variables, the second hypothesis is given:

H2. The effectiveness of use is positively related to student satisfaction.
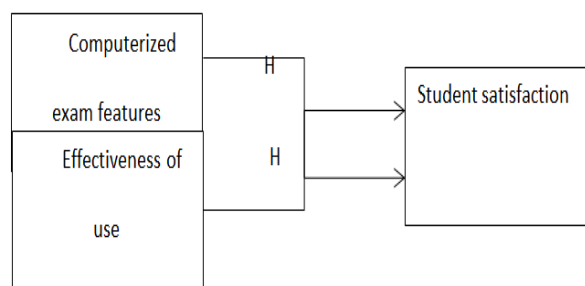

Figure 1. Proposed conceptual model

Method

Quantitative design is implemented as a research approach in this paper. The quantitative data is collected through a cross sectional survey from observed students (Simonetti, et al., 2015). The students are the analysis unit as a participant in this study.

Like quantitative research, this study tests the relationship between the variables through a correlational approach (Nardi, 2018). The proposed hypotheses are tested after data collection. The questionnaire survey was developed through the multistep process. Through a comprehensive literature review, the measured items of the questionnaire were validated for reliability using Structural Equation Modelling (SEM) Lisrel.

The data collection instrument was pretested by distributing to 30 participants. The pretests included structured interviews with the students. All of them were asked: first, whether the questions were easy to understand and clear enough to be accurately answered; second, whether any other questions needed to be added to the questionnaire; and third, who would be the most appropriate person(s) to contact for the study. Feedback from the pilot study was used to clarify some questions. Based on the feedback, some items in a few scales were either dropped or added. Finally, because of their familiarity with both organizational support and student performance, the general managers were determined to be the most appropriate participants. The survey instrument was pilot tested on the students proving its appropriateness and achieving the content validity of the constructs. All questions (40 items) of the four factors/dimensions were measured on a five point modified Likert scale (1 very low to 5 very high). The measurement items used in the survey are listed in the appendix. The questionnaire was sent by

email to participants that constitute the population size. We received two waves of responses including 89 and 107 questionnaires, respectively. A total of 196 valid questionnaires were collected, yielding a response rate of 38.75 percent, satisfying the criterion for SEM analysis (Wu and Liu, 2010). A profile of the responding firms is provided in Table I.

Table 1. The participants' demographic characteristics

Profile of the participants	No	%
Gender		
Male	134	68,4
Female	62	31,6
Age		
Less than 18 years old		
21 – 24 years old	53	27
24– 27 years old	89	45,4
28 – 31 years old	52	26,5
Greater than 31 years old	2	1
years of education		
Less than 1 years	78	39,7
23 years	103	52,5
Greater than 4 years	15	7,6

Source: Questionnaire data (2019)

Demographic characteristics

Site location is STMIK Swadharma which located in Jalan Malaka, Kota Administrasi Jakarta Pusat. The college has operated two faculties, e.g., Informatics Engineering (IE), and Information System (IS). The participant is collected from the site location. Most of them have enrolled in various years of study. The participant's demographic background is given in Table I which representing their gender, age, and years of study.

Method of Data Analysis

The tested variables in this study are the student's perception of the exam features, their effectiveness in using the exam, and their satisfaction toward the exam. We also want to test whether latent variables or constructs exist. To increase accuracy, the variables are expanded with some indicators that so called dimension of manifest variables to understand the relationship of the variables.

Structural Equation Model (SEM) Lisrel

Structural equation modeling (SEM) is used in this study comprehensively through the multivariate analysis process. There are two main characteristics of SEM testing. Firstly, an estimation of the interdependence of the multivariable, secondly, an ability to represent the unobserved concept in the model to measure the error of estimation. In the proposed model, it is assumed that variables have a normal distribution. A good model should have fitness values in the theoretical range to represent the TLI and CFI score with a normal distribution. The model testing is conducted through software SPSS and Lisrel. For testing the validity and reliability, a strict requirement is implemented on the sampling number, outliers and normality test.

The result of validity and reliability testing can be evidence that the proposed model is adequate. The result of the testing is given in the next part.

Data Analysis and Discussion
Validity and reliability testing

Validity testing is conducted by observing the value of the loading factor from the constructs. In the testing, the result is valid if the score of the loading factor >0.5. The result of validity testing from a total of 40 questions, there are 11 invalid statements with a loading factor <0.5. The invalid questions are dropped from the questionnaires with left 29 valid statements. The valid statement is tested to the reliability score to get AVE and CR. The valid statements are reliable if the AVE>0.5 AND CR>0.5.

It is evident that the entire model has adequate validity and reliability as shown in Table 2 (AVE>0.5; CR>0.7). the results showed that the model can be used for testing in a real situation. Therefore, we will implement the model to exam the research hypotheses. The steps in the model testing are" creation of the model, feasibility testing, and significance testing of exogen toward endogen variables. The complete scheme of the proposed SEM model and its specification is given in Fig.2. Figure 2. Result of Goodness of fit testing for the proposed SEM model and its specification

Chi-Square=2928.88, df=347, P-value=0.00000, RMSEA=0.195
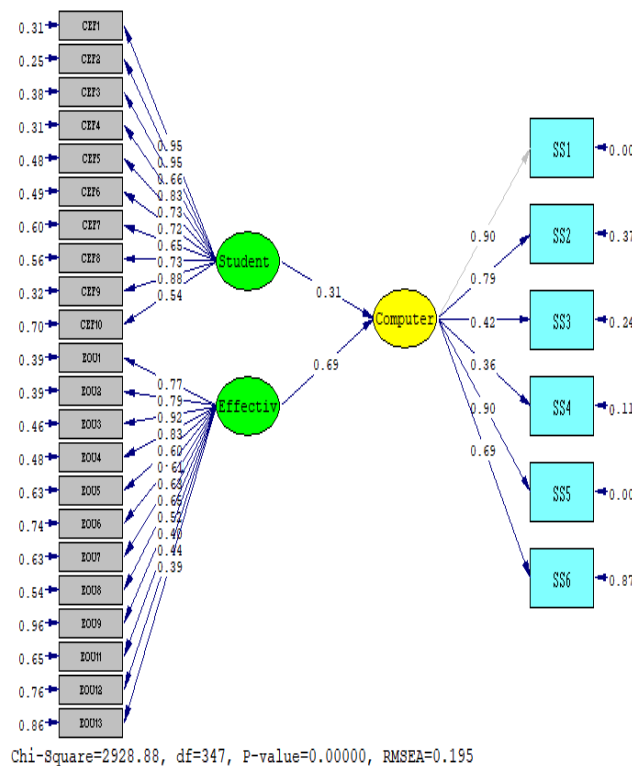
Source: analysis result of SEM Lisrel (2019)

From Table 2, it showed that the criteria of goodness of fit for the proposed model have been achieved especially on the Chi-square and probability with a value of over 0,05. The result showed that the proposed model has a covariant matrix equal

to the population covariant matrix. Therefore, the proposed model is adequate to be used in a real setting.

Table 2. Goodness criteria

Goodness of Fit	Cut off value	Result	Description
Probabilities Chi Square	$\geq 0,05$	0,077	Good Fit
CMIN/DF	$\leq 2,00$	1,422	Good Fit
GFI	$\geq 0,90$	0,838	Marginal Fit
AGFI	$\geq 0,90$	0,793	Marginal Fit
CFI	$\geq 0,90$	0,952	Good Fit
TLI	$\geq 0,90$	0,969	Good Fit
NFI	$\geq 0,90$	0,908	Good Fit
IFI	$\geq 0,90$	0,943	Good Fit
RMSEA	$\leq 0,08$	0,045	Good Fit
RMR	$\leq 0,05$	0,038	Good Fit

Source: analysis result of SEM Lisrel (2019)

Result of hypotheses testing

The hypotheses testing is conducted to understand the effect of each variable to create causal paths, their level of significance and the results of the squared multiple correlations for the endogenous factors. Therefore, we tested and compare their relationship.

For inspection of H1, the result indicates that, as expected, computerized exam features are positively related to student satisfaction.

Computerized exam features have a strong and significant positive effect on student satisfaction (H1: COM à SAT; p value = ***; CR=7,680; p value < 0,05; CR> 1,96). It is concluded that work computerized exam features have positively and significantly influenced student satisfaction. Higher computerized exam features will lead to increased student satisfaction, and vice versa. Therefore, H1 is accepted. The testing result of H2 is also provided satisfied result. As expected, the effectiveness of use has a strong and significant positive effect on student satisfaction (H2: EF à SAT; p value = ***; CR=6,878; p value < 0,05; CR> 1,96). It is concluded that the effectiveness of use has positively and significantly influenced student satisfaction. Higher effectiveness of use will lead to increased student satisfaction, and vice versa. Therefore, H2 is accepted.

Discussion

Several useful points are made in the present paper about the hypothesized model and its empirical validation. Several studies have attempted to address the effect of independent toward dependent variables and its related constructs. In this study, it presents and addresses four main constructs, namely, computerized exam features, the effectiveness of use, and student satisfaction. The constructs are tested using the data from STMIK Swadharma in the City of Jakarta.

After integrating the constructs into a defined model, we conduct and measure the respective items and the results showed that they have adequate and significant psychometric properties.

For computerized exam features in hypothesis H1, it affects student satisfaction positively. The result is similar to the previous study by Rohatgi, et al., (2016) that computerized exam features are also correlated since the computerized

exam features can provide a positive effect on student satisfaction. This means that a higher of computerized exam features will lead to better satisfaction.

This result is logical as supported by the theory of social cognitive and blended learning that satisfaction is related to their experience toward an environment that shaped their thought and action (Littlejohn, et al., 2016). Besides, by following Bandura's social cognitive theory, the computerized exam features can drive more intense engagement and finally higher satisfaction.

For general discussion, it is apparent from the results of the present study that computerized exam features and effectiveness of use are major contributors to student satisfaction (Rohatgi, et al., 2016). This result is supported by previous studies that representing the real situation, for example, STMIK Swadharma with a certain number of students always implement the exam effectively through routine knowhow and training, accept the changes required and present greater commitment to maintaining the exam system by adding and updating the exam system to improve the student satisfaction.

Conclusion

The purpose of this study is to analyze the effect of computerized exam features and effectiveness of use on student satisfaction. The result provides empirical support for the major structural relationships proposed in the conceptual model. Some student's attributes have a higher effect on student satisfaction as tested in this study. The hypothesized relationships between the factors have an acceptable fit with data. Thus, the results of this study clarify the controversial subject of the contribution of this study which has been related to student satisfaction literature.

Our study results have a contribution to the development of knowledge in the area. More specifically, the study provides a theoretical basis regarding the effect of computerized exam features and effectiveness of use on student satisfaction, as well as their final effect to maintain satisfaction.

Finally, this work has successfully bridged the gap between theory and practice by providing STMIK Swadharma with a framework to help them improve, and thus become more competitive and sustainable in implementing the computerized exam system. The study suggests that students must be well educated, empowered, involved and accept the changes required to achieve and maximize their participation to pass the exam system. A well-educated and continuously trained student base is vital to pass the system by following the rule and policies of the exam instruction.

Managerial implications

The results of this study offer significant implications for both the student and lecturers of STMIK Swadharma. The findings of this study should motivate the college to concentrate on the system quality and its features to improve student satisfaction. The enhanced computerized exam features of students will lead them to the creation of continuous improvement through online interaction. Besides, proper training and education of students at all levels of an organization also improve the effectiveness of use and finally the satisfaction. As managing satisfaction can be problematic, the research result in this paper can address these problems through better strategies and policies of updating the system features to

ensure that its features are relevance and adequate to support the student engagement with the computerized exam system.

The study also helps exam administrators to realize that the performance of the system must be based on the features needed by the students. Thus, the effectiveness of use directly, while they may influence student satisfaction is a key contributor to the successful exam system.

References

AlAzawei, A., Parslow, P., & Lundqvist, K. (2016). Barriers and opportunities of elearning implementation in Iraq: A case of public universities. *The International Review of Research in Open and Distributed Learning, 17*(5).

Annamdevula, S., & Bellamkonda, R. S. (2016). Effect of student perceived service quality on student satisfaction, loyalty, and motivation in Indian universities: Development of HiEduQual. *Journal of Modelling in Management, 11*(2), 488517.

Apugliese, A., & Lewis, S. E. (2017). Impact of instructional decisions on the effectiveness of cooperative learning in chemistry through metaanalysis. *Chemistry Education Research and Practice, 18*(1), 271278.

Balta, N., PereraRodríguez, V. H., & HervásGómez, C. (2018). Using socrative as an online homework platform to increase students' exam scores. *Education and Information Technologies, 23*(2), 837850.

Bano, M., & Zowghi, D. (2015). A systematic review of the relationship between user involvement and system success. *Information and Software Technology, 58*, 148169.

Bjorklund, D. F., & Causey, K. B. (2017). *Children's thinking: Cognitive development and individual differences.* Thousand Oaks: Sage Publications.

Bol, L., Campbell, K. D., Perez, T., & Yen, C. J. (2016). The effects of selfregulated learning training on community college students' metacognition and achievement in developmental math courses. *Community College Journal of Research and Practice, 40*(6), 480495.

Bottiani, J. H., Bradshaw, C. P., & Mendelson, T. (2017). A multilevel examination of racial disparities in high school discipline: Black and white adolescents' perceived equity, school belonging, and adjustment problems. *Journal of Educational Psychology, 109*(4), 532.

Brock, A., & Hundley, H. (2016). *The growth mindset coach: A teacher's month by month handbook for empowering students to achieve.* Berkeley, CA: Ulysses Press.

Calderón, A., Meroño, L., & MacPhail, A. (2019). A student centered digital technology approach: The relationship between intrinsic motivation, learning climate, and academic achievement of physical education preservice teachers. *European Physical Education Review,* 1356336X19850852.

Cameron, K. (2015). Organizational effectiveness. *Wiley Encyclopedia of Management*, 14.

Card, S. K. (2018). *The psychology of human computer interaction*. Boca Raton: CRC Press.

Connolly, G. J. (2017). Applying social cognitive theory in coaching athletes: The power of positive role models. *Strategies, 30*(3), 2329.

Czerkawski, B. C., & Lyman, E. W. (2016). An instructional design framework for fostering student engagement in online learning environments. *TechTrends, 60*(6), 532539.

Darling Hammond, L. (2015). *The flat world and education: How America's commitment to equity will determine our future*. New York: Teachers College Press.

De Boer, H., Jongbloed, B., Benneworth, P., Cremonini, L., Kolster, R., Kottmann, A., ... & Vossensteyn, H. (2015). *Performance-based funding and performance agreements in fourteen higher education systems*. Enschede: Center for Higher Education Policy Studies.

De Marco, A. P., & Broshek, D. K. (2016). Computerized cognitive testing in the management of youth sportsrelated concussion. *Journal of child neurology, 31*(1), 6875.

Debuse, J. C., & Lawley, M. (2016). Benefits and drawbacks of computer-based assessment and feedback systems: Student and educator perspectives. *British Journal of Educational Technology, 47*(2), 294301.

Dennis, A., Wixom, B. H., & Roth, R. M. (2018). *Systems analysis and design.* Hoboken: John Wiley & sons.

Devi, B., Khandelwal, B., & Das, M. (2017). Application of Bandura's social cognitive theory in the technology enhanced, blended learning environment. *International Journal of Applied Research, 3*(1), 721724.

Flynn, A. B., & Featherstone, R. B. (2017). Language of mechanisms: Exam analysis reveals students' strengths, strategies, and errors when using the electronpushing formalism (curved arrows) in new reactions. *Chemistry Education Research and Practice, 18*(1), 6477.

Grange, T. D. A. G., de Jorge, B., Franci, D., Santos, T. M., Setubal, M. S. V., Schweller, M., & de CarvalhoFilho, M. A. (2016). Cognitive load and self-determination theories applied to e learning: Impact on students' participation and academic performance. *Plus One, 11*(3), e0152462.

Halpern, M., Zhu, Y., & Reddi, V. J. (2016, March). *Mobile CPU'S rise to power: Quantifying the impact of generational mobile CPU design trends on performance, energy, and user satisfaction*. In 2016 IEEE International Symposium on High Performance Computer Architecture (HPCA) (pp. 6476). IEEE.

Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education, 80,* 152161.

Harasim, L. (2017). *Learning theory and online technologies.* New York: Routledge.

Harrati, N., Bouchrika, I., Tari, A., & Ladjailia, A. (2016). Exploring user satisfaction for elearning systems via usage-based metrics and system usability scale analysis. *Computers in Human Behavior, 61,* 463471.

Holinka, C. (2015). Stress, emotional intelligence, and life satisfaction in college students. *College Student Journal, 49*(2), 300311.

Horvat, A., Dobrota, M., Krsmanovic, M., & Cudanov, M. (2015). Student perception of the Moodle learning management system: A satisfaction and significance analysis. *Interactive Learning Environments, 23*(4), 515527.

Hwang, G. H., Chen, B., & Huang, C. W. (2016). Development and effectiveness analysis of a personalized ubiquitous multi device certification tutoring system based on bloom's taxonomy of educational objectives. *Journal of Educational Technology & Society, 19*(1), 223236.

James, L. T., & Casidy, R. (2018). Authentic assessment in business education: Its effects on student satisfaction and promoting behavior. *Studies in higher education, 43*(3), 401415.

Johansen, J. D., Aalto-Korte, K., Agner, T., Andersen, K. E., Bircher, A., Bruze, M., ... & John, S. M. (2015). European society of contact dermatitis guideline for diagnostic patch testing–recommendations on best practice. *Contact dermatitis, 73*(4), 195221.

Johnson, L., Becker, S. A., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC horizon report: 2016 higher education edition* (pp. 150). Austin, Texas: The New Media Consortium.

Jones, G., & Alba, A. D. (2019). Reviewing the effectiveness and learning outcomes of a 3D virtual museum: A pilot study. In *Virtual Reality in Education: Breakthroughs in Research and Practice* (pp. 5275). Hershey, Pennsylvania: IGI Global.

Kintu, M. J., Zhu, C., & Kagambe, E. (2017). Blended learning effectiveness: The relationship between student characteristics, design features, and outcomes. *International Journal of Educational Technology in Higher Education, 14*(1), 7.

Ladhari, R., Souiden, N., & Dufour, B. (2017). The role of emotions in utilitarian service settings: The effects of emotional satisfaction on product perception and behavioral intentions. *Journal of Retailing and Consumer Services, 34*, 1018.

Lee, J., Lim, C., & Kim, H. (2017). Development of an instructional design model for flipped learning in higher education. *Educational Technology Research and Development, 65*(2), 427453.

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. *The Internet and Higher Education, 29,* 4048.

Malik, M. F., & Khan, M. N. A. (2016). An analysis of performance testing in distributed software applications. *International Journal of Modern Education and Computer Science, 8*(7), 53.

McDougall, W. (2015). An introduction to social psychology. Kitchener, Ontario: Psychology Press.

McKnight, K., O'Malley, K., Ruzic, R., Horsley, M. K., Franey, J. J., & Bassett, K. (2016). Teaching in a digital age: How educators use technology to improve student learning. *Journal of research on technology in education, 48*(3), 194211.

Meier, D., & Knoester, M. (2017). *Beyond testing: Seven assessments of students and schools more effective than standardized tests*. New York City**:** Teachers College Press.

Moridis, C. N., Terzis, V., Economides, A. A., Karlovasitou, A., & Karabatakis, V. E. (2018). Using EEG frontal asymmetry to predict IT user's perceptions regarding the usefulness, ease of use, and playfulness. *Applied psychophysiology and biofeedback, 43*(1), 111.

Moser, R. S., Schatz, P., & Lichtenstein, J. D. (2015). The importance of proper administration and interpretation of neuropsychological baseline and post-concussion computerized testing. *Applied Neuropsychology: Child, 4*(1), 4148.

Myers, R. H., Montgomery, D. C., & AndersonCook, C. M. (2016). *Response surface methodology: Process and product optimization using designed experiments*. Hoboken, NJ: John Wiley & Sons.

Napitupulu, D., Rahim, R., Abdullah, D., Setiawan, M. I., Abdillah, L. A., Ahmar, A. S., ... & Pranolo, A. (2018, January). Analysis of student satisfaction toward the quality of the service facility. *Journal of Physics: Conference Series, 954*(1), 012019. IOP Publishing.

Nardi, P. M. (2018). *Doing survey research: A guide to quantitative methods.* New York: Routledge.

Navimipour, N. J., & Zareie, B. (2015). A model for assessing the impact of elearning systems on employees' satisfaction. *Computers in Human Behavior, 53,* 475485.

Nilson, L. B. (2016). *Teaching at its best: A research based resource for college instructors.* Hoboken: John Wiley & Sons.

Oliver, G. P. (2017). Taking it to heart: A case study of supporting English language learners through culturally responsive teaching, collaboration, and ESOL focused leadership. The State University of New York at Albany.

Permzadian, V., & Credé, M. (2016). Do first year seminars improve college grades and retention? A quantitative review of their overall effectiveness and an examination of moderators of effectiveness. *Review of Educational Research, 86*(1), 277316.

Rahimi, E., van den Berg, J., & Veen, W. (2015). Facilitating student driven constructing of learning environments using Web 2.0 personal learning environments. *Computers & Education, 81,* 235246.

Rangel, V. S., & Coulson, H. L. (2017). Educational resilience: How students navigate the challenges of attending an early college high school. *Annual meeting of the University Council for Educational Administration November.*

Rashid, T., & Asghar, H. M. (2016). Technology use, self -directed learning, student engagement, and academic performance: Examining the interrelations. *Computers in Human Behavior, 63,* 604612.

Rohatgi, A., Scherer, R., & Hatlevik, O. E. (2016). The role of ICT self efficacy for students' ICT use and their achievement in a computer and information literacy test. *Computers & Education, 102*, 103116.

Romiszowski, A. J. (2016). *Designing instructional systems: Decision making in course planning and curriculum design*. London: Routledge.

Rowntree, D. (2015). *Assessing students: How shall we know them?*. London: Routledge.

Shoemaker, J. R., Chavez, R. A., Keane, P., Butz, S., & Yowler, S. K. (2017). Effective utilization of computerized curricular assistive tools in improving NCLEXRN pass rates for a baccalaureate nursing program. *CIN: Computers, Informatics, Nursing, 35*(4), 194200.

Simonetti, V., Comparcini, D., Flacco, M. E., Di Giovanni, P., & Cicolini, G. (2015). Nursing students' knowledge and attitude on pressure ulcer prevention evidence based guidelines: A multicenter crosssectional study. *Nurse education today, 35*(4), 573579.

Skinner, B. F. (2016). The technology of teaching. BF Skinner Foundation.

Smith, G. G., Besalti, M., Nation, M., Feldman, A., & Laux, K. (2019). Teaching climate change science to high school students using computer games in an intermedia narrative. *Eurasia Journal of Mathematics, Science and Technology Education, 15*(6).

Strayhorn, T. L. (2018). *College students' sense of belonging: A key to educational success for all students.* New York: Routledge.

Sung, Y. T., Chang, K. E., & Liu, T. C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education, 94,* 252275.

Tarhini, A., Hone, K., Liu, X., & Tarhini, T. (2017). Examining the moderating effect of individual level cultural values on users' acceptance of E-learning in developing countries: a structural equation modeling of an extended technology acceptance model. *Interactive Learning Environments, 25*(3), 306328.

Tidd, J., & Bessant, J. R. (2018). *Managing innovation: Integrating technological, market, and organizational change.* Hoboken, NJ: John Wiley & Sons.

Trelease, R. B. (2016). From chalkboard, slides, and paper to e-learning: How computing technologies have transformed anatomical sciences education. *Anatomical sciences education, 9*(6), 583602.

Turner, J., & Briggs, G. (2017). Using third party audiovisual materials in module production: learning design, cost effectiveness, and student satisfaction on DD210 and DE200.

Wampoid, B. E. (2015). The intensive examination of social interaction. In Single Case Research Design and Analysis (Psychology Revivals) (pp. 105144). Routledge.

Wang, M., Cheng, B., Chen, J., Mercer, N., & Kirschner, P. A. (2017). The use of web based collaborative concept mapping to support group learning and interaction in an online environment. *The Internet and Higher Education, 34,* 2840.

Whiteside, A. L. (2015). Introducing the social presence model to explore online and blended learning experiences. *Online Learning, 19*(2), n2.

Wlodkowski, R. J., & Ginsberg, M. B. (2017). *Enhancing adult motivation to learn: A comprehensive guide for teaching all adults.* Hoboken, NJ: John Wiley & Sons.

Yang, H., Yu, J., Zo, H., & Choi, M. (2016). User acceptance of wearable devices: An extended perspective of perceived value. *Telematics and Informatics, 33*(2), 256269.

Yilmaz, R. (2017). Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classrooms. *Computers in Human Behavior, 70,* 251260.

Yu, G. O. (2016). Intellectual and personality factors in the achievement of high exam effectiveness in first year Russian university students. *Psychology in Russia: State of the art, 9*(3).

TEACHER'S CAPACITY MANAGEMENT TECHNIQUES FOR IMPROVED EDUCATIONAL OUTCOME AMONG PRIVATE AND PUBLIC SECONDARY SCHOOL STUDENTS IN NIGERIA

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Abstract
The study investigated teacher's capacity management techniques for improved educational outcome of private and public secondary school students in Nigeria. Design of the study was analytical survey and correlation. There were 297 private secondary school teachers in and 258 public secondary school teachers in approved secondary schools in Nigeria who served as respondents for the study. The results of the study showed private secondary school teachers differ from public teachers in capacity monitoring, capacity analysis, capacity tuning, capacity planning and demand management for student's improved educational outcome. There was also a significant relationship between these variables. It was concluded that capacity monitoring contributed to student's educational outcome and as such capacity management training was recommended for these teachers.

Keywords: capacity management, education, educational outcome, Nigeria, private

Introduction

Every learner as well as their parents and guardians look forward to consistent improvement in their educational outcome. This is because the educational outcome of students contributes significantly to their transition rate to higher levels of education as well as labour market opportunities. Student's educational outcome which is often determined through regular assessment also helps to identify the areas of academic strengths and weaknesses among students for necessary intervention. The educational outcome of students has several benefits to students, teachers, parents and other educational stakeholders as this output is used for several educational decisions and as such cannot be ignored in any educational system no matter the level.

The educational outcome of students in private and public secondary schools has been an issue of debate across different educational institutions: universities, polytechnics, colleges of education, secondary schools among others. This because, aside the learning facilities, it is believed that the teaching personnel also influences students learning outcome to a great extent. For example, the study conducted by Mijinyawa, Yeldu, Umar and Hussaini (2017) showed that the performance of students in Biology, Physics and Chemistry favoured the private secondary school students in Birni Kebbi Metropolis, Nigeria more than those in public schools.

Supporting this assertion, the study by Babalola (2018) also corroborated that despite having more experienced teachers than those in the private schools, students in public schools performed lesser academically than their private counterpart. Private and public secondary school students share arguably the same curriculum but sometimes show difference in capacity academically, entrepreneurially, socially and otherwise. Similarly, people have different opinions about the performance of private as well as public secondary school graduates in the society when saddled with the same responsibilities after schooling in the same environment. This has become an issue of concern to many stakeholders and as such an inquiry into the capacity management techniques teachers' use for this category of students for improved educational outcomes as well as labour market efficiency.

Capacity management is a concept used majorly in the field of Information Technology (IT) and it refers to the set of activities carried out to maximize productivity as well as efficiency at all times and under the same condition. This concept is also significant in the field of education as it is used to refer to all efforts put in place to ensure that educational output including performance is optimal under the same condition for different categories of people. Capacity management techniques of teachers refer to all efforts put in place by the teacher to ensure that the abilities of students meet the required standard in line with the objectives of that level of education. In order to balance the differences in the educational outcome as well as labour market competencies of private as well as public secondary school students, instructors must ensure that they regularly implement the needed capacity management techniques for these students so as to balance the educational differentials among them.

One of the techniques that instructors can apply to achieve this objective is by enforcing capacity monitoring techniques. Capacity monitoring is the act of supervising the activities executed by students as well as ensuring that relevant guidance is provided for the purpose of meeting outlined objectives. It is an important practice in the success of any organization (Hervie & Winful, 2018). Capacity analysis on the other hand, focuses on identifying the strength and weakness of each student and group. This strategy has been used to enhance performance in different organizations (Yilmaz & Alouini, 2010). This is necessary for the purpose of decision making as well as providing remedial action. Capacity analysis techniques will enable the teacher identify the point where further action will be required in the teaching and learning process. Teachers also need to enforce relevant capacity planning techniques. Utley and Worthington (2012:12) quipped that:

> Capacity planning is the process by which organizations determine the broad level of resources they make available for the delivery of a service or a set of services. Capacity planning is deciding on the amount of equipment or resources sufficient to enable an organization to meet demand for one or more packages of care or objectives while achieving specified service standards.

Capacity planning also involves making future forecast on classroom activities that will be carried out by these students taking into consideration the learning environment as well as the learner's personality. All of these factors are essential for balancing the educational outcome of Private and Public students. The teacher

needs to adapt relevant capacity planning techniques to bring all of these students to a point of optimality in educational outcome. Similarly, the teachers must in the same process engage capacity tuning techniques which is the act of putting in place strategies for improving the performance of each student. It is at the capacity tuning stage that the learning limitations of students are consciously turned to strength. In the same manner, Lalor, Wu and Yu (2017:4) asserted that capacity tuning aligns with the process of improving performance both in terms of accuracy and latent ability. Capacity tuning is also important in the school system such that through the *tuning* protocol, teachers share student work (Croft, Coggshall, Dolan, Powers & Killion, 2010) which ensures that all students are performing almost at the same level. Since these students are produced to take care of societal needs, teachers must make concerted effort to ensure that both categories of student meet the demands of the society and this is the focus of the demand management technique of teachers. Croxton, Lambert, García-Dastugue and Rogers (2002:51) asserted that:

> The demand management process is concerned with balancing the customers' requirements with the capabilities of the supply chain. This includes forecasting demand and synchronizing it with production, procurement and distribution capabilities. A good demand management process can enable a company to be more proactive to anticipated demand and more reactive to unanticipated demand.

Teachers who handle private and public secondary school students must ensure that as a result of the relatedness of both institutions, students should be trained to meet the demands of the society competently. This target will reflect in the educational outcome of these students. This will ensure that students in Private and Public meet the immediate and future educational goals and objectives of the education sector. The management of capacity can lead to the attainment of different objectives even in the same environment (Sajid, n.d.). Capacity management is vital for the improvement of the educational performance of private and public secondary school students. Since these students share almost the same curriculum contents, teachers handling these students both generally and specifically need to be acquainted with relevant capacity management techniques. It is the enforcement of these techniques that will close the gap in the educational performance of private and public secondary school students. It is based on this premise that the study x-rays teacher's enforcement of capacity management techniques for improved educational outcome among private and public secondary school students in Nigeria.

Theoretical Framework
The theory upon which this study was anchored is David Kolb's (1984) Experiential Learning Theory. This theory focused on how meaningful learning takes place for improved educational outcome, identified the conditions upon which this goal can be achieved. This theory point to the fact that skills and job requirements must be commensurate and such progress is only made when the cycle of learning is completed. This theory is explained under two stages which are the four-stage cycle of learning as well as the four separate learning styles. These stages work interdependently for the goals of learning to be achieved.

The learning cycle which is the first stage of the experiential learning theory consists of four phases which are concrete learning, reflective observation, abstract conceptualization and active experimentation. The separate learning styles which are the second stage identified the fact that learners want to adapt to a specific learning style, but this is determined by two factors which are how the learning process is approached as well as response to the task ahead. It is the enforcement of these practices that makes learning impactful with all intended objectives achieved. This cycle as postulated by Kolb is revealed in Fig. 1 below:
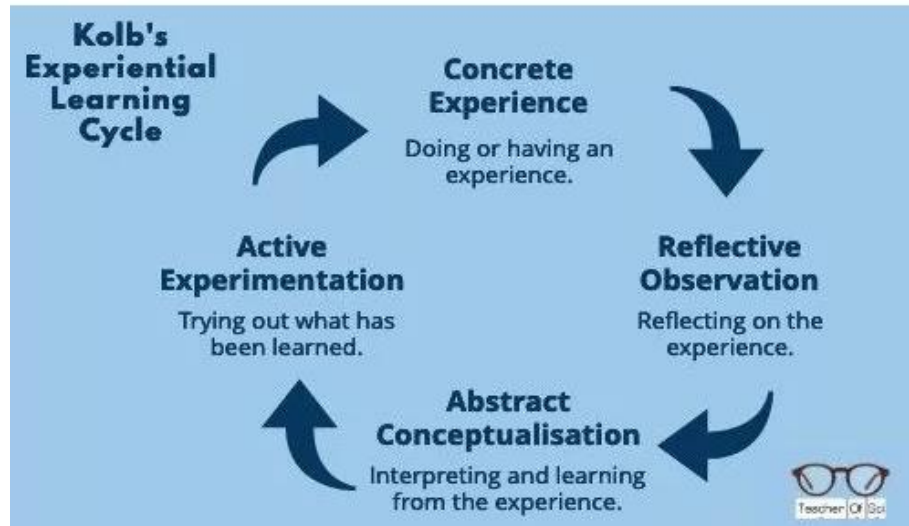
Figure 1. The Learning Cycle
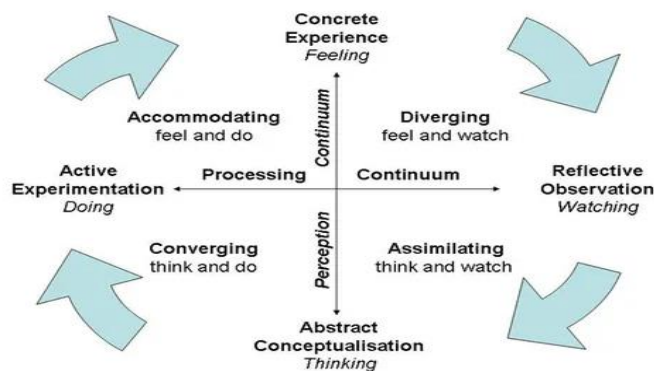
Figure 2. The Learning Style

The experiential learning theory no doubt captures how learning outcome can be enhanced in the classroom and the school in general. This theory focuses on key elements that make students learn meaningfully and these activities involve the participation of the teacher as well as the students. The teacher also has a lot of role to play to make learning easy for the students. This is why the teacher needs to be informed as well as engage meaningful capacity management techniques so as to improve the chances of the students performing well academically. The entire activities executed by the teacher in the capacity management process plays a

significant role in the performance of students across all stages captured in the experiential learning theory developed by David Kolb.

Purpose of the Study

The purpose of the study was to investigate teachers' capacity management techniques for improved educational outcome of private and public secondary school students in Nigeria.

Research Questions

The research questions raised in the study were as follows:
1. What are teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria?
2. What are teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria?
3. What are teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria?
4. What are teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria?
5. What are teacher's demand management techniques for improved educational outcome of private and public secondary school students in Nigeria?

Research Hypotheses

The following hypotheses were tested at 0.05 level of significance:
1. There is no significant relationship in teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria
2. There is no significant relationship in teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria
3. There is no significant relationship in teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria
4. There is no significant relationship in teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria
5. There is no significant relationship in teacher's demand management techniques for improved educational outcome of private and public secondary school students in Nigeria

Methodology

The design adopted for the study is both analytical survey as well as correlation. Population of the study comprised all the private and public secondary school in Nigeria. However, purposive sampling technique was used to draw two secondary schools from the Northern and Southern regions of Nigeria. Respondents used for the study were private and public teachers in these secondary school who were selected using stratified random sampling technique associated with

convenience sampling since the respondents were drawn based on their availability and accessibility. This was because the schools were drawn from the regions and this was followed by the individual schools and disciplines especially those who were available at the time of the study.

Sample of the study consisted of 297 private teachers as well as 258 public teachers who were drawn for the study. The instrument used for data collection was a 25 items questionnaire tagged "Capacity Management and Educational Outcome Questionnaire" (CMEOQ) and this was validated by four experts in University of Port Harcourt, Nigeria. The reliability of the instrument was determined using Cronbach alpha with an index of 0.84 which was considered adequate for the study. The research questions were answered using mean and standard deviation, while the hypotheses were tested using Cohen's d statistics at 0.05 level of significance. The criterion mean was determined by adding up the weight of the responses, Strongly Agreed 4, Agreed 3, Disagreed 2 and Strongly Disagreed 1 and the total was divided by 4 to arrive at the criterion mean score of 2.50 used for decision making. A criterion mean score of 2.50 was used to determine whether to accept or reject items in the research questions.

Results and Discussion
Answer to Research Questions
Research Question One: What are teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria?

Table 1. Mean and standard deviation scores of teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria

S/No	Items	Private n=297		Public n=258		Mean Set	
		Mean $\overline{X}_1$	SD	Mean $\overline{X}_2$	SD	X $\overline{X}$	Decision
1	Innovative ideas among students are often rewarded by the teacher	2.88	0.99	1.92	1.08	2.40	Disagreed
2	Improved ideas, methods and processes are shared by the teacher with the students	2.80	1.08	1.80	1.26	2.30	Disagreed
3	Teachers allow the creation of informal groups which contributes to students educational outcomes	2.64	1.28	2.36	1.21	2.50	Agreed
4	There is provision for regular feedback during teacher and	2.44	1.18	2.26	1.40	2.35	Disagreed

S/No							
	students interaction						
5	Underperforming students are regularly provided constructive assistance	2.68	1.19	2.66	1.10	2.67	Agreed
	Grand Mean and Standard Deviation	**2.69**	**1.14**	**2.20**	**1.21**	**2.44**	**Disagreed**

*Scale: 1-1.25: Strongly Disagreed (SD), 1.26-2.49: Disagreed (D), 2.50-3.25: Agreed (A), 3.26-4.00: Strongly Agreed (SA)

The responses of the private teachers sampled for the study to items 1, 2, 3, 4 and 5 produced mean scores of 2.88, 2.80, 2.64, 2.44 and 2.68. items 1, 2, 3 and 5 with mean scores of 2.88, 2.80, 2.64 and 2.68 means that the respondents agreed to the items while 4 with mean score of 2.44 was disagreed. The same set of items was responded to by teachers in public with mean values of 1.92, 1.80, 2.36, 2.26 and 2.66. Only item 5 with mean score of 2,66 was agreed to while the other items; 1, 2, 3 and 4 with mean scores of 1.92, 1.80, 2.36 and 2.26 were disagreed in response to the questions raised. In summary, the average mean score of 2.44 implied that the sampled respondents both disagreed on teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school in Nigeria. However, the grand mean of 2.69 from the private teachers showed that they agreed while the grand mean of 2.20 from the public teachers implied that they disagreed on teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria.

Research Question Two: What are teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria?

Table 2. Mean and standard deviation scores of teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria

S/No	Items	Private n=297		Public n=258		Mean	Set
		Mean $\overline{X}_1$	SD	Mean $\overline{X}_2$	SD	$X \overline{X}$	Decision
6	Students are not given educational responsibilities above their competence level	2.86	1.10	2.46	1.15	2.66	Agreed
7	The suitability of the physical classroom environment is considered before initiating teaching and learning activities	2.60	1.11	2.18	1.29	2.39	Disagreed

S/No	Items						
8	Teachers select the right combination of teaching tools that will improve student's educational outcome	3.00	0.92	2.34	1.38	2.67	Agreed
9	Teachers undergo regular personal assessment programs to improve their level of teaching competence	2.48	1.16	1.74	1.20	2.11	Disagreed
10	Competitive events are organized to determine students educational competence	2.88	1.10	1.92	1.19	2.40	Disagreed
	Grand Mean and Standard Deviation	**2.76**	**1.08**	**2.13**	**1.24**	**2.45**	**Disagreed**

*Scale: 1-1.25: Strongly Disagreed (SD), 1.26-2.49: Disagreed (D), 2.50-3.25: Agreed (A), 3.26-4.00: Strongly Agreed (SA)

It was revealed in table 2 that the responses of the private teachers sampled for the study to items 6, 7, 8, 9 and 10 produced mean scores of 2.86, 2.60, 3.00, 2.48 and 2.88. Items 6, 7, 8 and 10 with mean scores of 2.86, 2.60, 3.00 and 2.88 implied that the items were agreed while item 9 with mean score of 2.48 was disagreed in relation to the question items raised. Teachers in public also responded to the same set of items with mean scores of 2.46, 2.18, 2.34, 1.74 and 1.92. All of these items were below the criterion mean score of 2.50 used for decision making and as such implied that they were disagreed in respect to the questions raised. The average mean score of 2.45 showed that the private teachers as well as the public teachers collectively disagreed on teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria. However, the private teachers sampled for the study agreed with a grand mean score of 2.76 while the public teachers disagreed with a grand mean score of 2.13 on teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria.

Research Question Three: What are teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria?

Table 3. Mean and standard deviation scores of teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria

S/No	Items	Private n=297		Public n=258		Mean Set	
		Mean $\overline{X}_1$	SD	Mean $\overline{X}_2$	SD	X $\overline{X}$	Decision
11	Teachers have alternative action	3.10	0.93	2.16	1.41	2.63	Agreed

	plans for meeting educational goals and objectives						
12	The future roles and responsibilities of students are considered when designing classroom instruction	2.84	1.12	2.30	1.31	2.57	Agreed
13	The cost and benefit implication of educational programmmes are considered by teachers before initiation	2.72	1.18	2.34	1.07	2.53	Agreed
14	Requirements for each classroom activities are scheduled ahead of time in line with intended educational objectives	2.72	0.87	2.46	1.39	2.59	Agreed
15	Emphasis is laid on assembling the best skill sets that will improve student's educational outcome	2.90	0.96	1.90	1.32	2.40	Disagreed
	Grand Mean and Standard Deviation	**2.86**	**1.01**	**2.23**	**1.30**	**2.54**	**Agreed**

*Scale: 1-1.25: Strongly Disagreed (SD), 1.26-2.49: Disagreed (D), 2.50-3.25: Agreed (A), 3.26-4.00: Strongly Agreed (SA)

Table 3 showed the mean scores of private teachers sampled for the study to items 11, 12, 13, 14 and 15 as 3.10, 2.84, 2.72, 2.72 and 2.90 while the public teachers sampled for the study responded to the same set of items with mean scores of 2.16, 2.30, 2.34, 2.46 and 1.90. All the items responded to by the private teachers were all agreed in respect to the items raised while the same set of items were all disagreed by the public teachers sampled for the study. However, averagely, the respondents both agreed with an average mean value of 2.54 on teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria. Private teachers however agreed with a grand mean score of 2.86 while the public teachers disagreed with a grand mean score of 2.23 on teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria.

Research Question Four: What are teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria?

Table 4. Mean and standard deviation scores of teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria

S/No	Items	Private n=297		Public n=258		Mean Set	
		Mean $\overline{X}_1$	SD	Mean $\overline{X}_2$	SD	X $\overline{X}$	Decision
16	Educational problems among students are assessed and categorized	2.60	0.98	1.72	1.13	2.16	Disagreed
17	Students performance are measured before any modification in the curriculum	2.98	0.91	2.42	1.18	2.70	Agreed
18	Teachers identify learning bottlenecks among students and eliminate them	2.76	1.02	2.54	1.18	2.65	Agreed
19	Teaching strategies that improve student's educational outcome are often adopted	3.18	0.64	2.42	1.15	2.80	Agreed
20	Teachers fully understand the factors that contribute optimally to student's educational outcome	3.02	0.97	2.32	1.08	2.67	Agreed
	Grand Mean and Standard Deviation	**2.91**	**0.90**	**2.28**	**1.14**	**2.60**	**Agreed**

*Scale: 1-1.25: Strongly Disagreed (SD), 1.26-2.49: Disagreed (D), 2.50-3.25: Agreed (A), 3.26-4.00: Strongly Agreed (SA)

Items 16, 17, 18, 19 and 20 were responded to in table 4 by private teachers with mean scores of 2.60, 2.98, 2.76, 3.18 and 3.02 and since these items were all above the criterion mean score of 2.50, they were all agreed in response to the items raised. However, the public teachers sampled for the study responded to the same set of items with mean scores of 1.72, 2.42, 2.54, 2.42 and 2.32. Only item 18 with mean score of 2.54 was agreed while the remaining items were disagreed in respect

to the items raised. In summary, the average mean score of 2.60 indicated that the respondents both agreed on teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria. Individually, the private teachers with grand mean score of 2.91 agreed while the public teachers with mean score of 2.28 disagreed on teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria.

Research Question Five: What are teacher's demand management techniques for improved educational outcome of private and public secondary school students in Nigeria?

Table 5. Mean and standard deviation scores of teacher's demand management techniques for improved educational outcome of private and public secondary school students in Nigeria

S/No	Items	Private n=297		Public n=258		Mean Set	
		Mean $\bar{X}_1$	SD	Mean $\bar{X}_2$	SD	X $\bar{X}$	Decision
21	Teachers hold regular communication with general education stakeholders	2.34	0.97	2.32	1.25	2.33	Strongly Disagreed
22	Teachers have and institute personal policies for promoting and graduating students	3.06	0.99	1.52	1.24	2.29	Disagreed
23	Teachers prepare their students for varieties of societal needs as well as for different sectors	3.04	0.96	1.80	1.14	2.42	Disagreed
24	Teachers have ways of publicizing educational activities and achievements	2.22	1.16	1.82	1.29	2.02	Disagreed
25	Classroom activities are professionally scheduled to meet market and societal demand	2.86	1.03	2.34	1.24	2.60	Agreed
	Grand Mean and Standard Deviation	**2.70**	**1.02**	**1.96**	**1.23**	**2.33**	**Disagreed**

*Scale: 1-1.25: Strongly Disagreed (SD), 1.26-2.49: Disagreed (D), 2.50-3.25: Agreed (A), 3.26-4.00: Strongly Agreed (SA)

Table 5 showed that private teachers sampled for the study responded to items 21, 22, 23, 24 and 25 with mean scores of 2.34, 3.06, 3.04, 2.22 and 2.86. Items 21 and 24 with mean scores of 2.34 and 2.22 were disagreed while items 22, 23 and

25 with mean values of 3.06, 3.04 and 2.86 were agreed. On the other hand, the public teachers responded to the same set of items with mean scores of 2.32, 1.52, 1.80, 1.82 and 2.34. Since all of these items were below the criterion mean score of 2.50 used for decision making, they were all disagreed in respect to the items raised. The average mean score of 2.33 implied that the respondents disagreed on teacher's demand management techniques for improved educational outcome of private and public students in secondary schools in Nigeria. The private teachers sampled for the study agreed with a grand mean score of 2.70 while the public teachers disagreed with a grand mean score of 1.96 on teacher's demand management techniques for improved educational outcome of private and public secondary school students in Nigeria.

Hypotheses Testing

HO$_1$: There is no significant relationship in teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria

Table 6. t-test of relationship in teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria

Variable	n	df	Cohen's D	r	t-cal.	t-crit.	Sig. Level	Decision
Capacity Monitoring	297	2	0.41	0.20	4.80	3.17	0.05	Significant Relationship
Educational Outcome	258	553						

In table 6, the value of Cohen's D of 0.41 implied a weak effect and the correlation value of r=0.20 also showed a low positive relationship between capacity monitoring and improved educational outcome. The value of t-cal. of 4.80 which was more than the value of t-crit. of 3.17 also indicated that there was a significant relationship in teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria

HO$_2$: There is no significant relationship in teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria

Table 7. t-test of relationship in teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria

Variable	n	df	Cohen's D	r	t-cal.	t-crit.	Sig. Level	Decision
Capacity Analysis	297	2	0.54	0.26	6.34	3.17	0.05	Significant Relationship
Educational Outcome	258	553						

Table 7 indicated the value of Cohen's D to be 0.54 which was a medium effect and the correlation value of r=0.26 also implied a low positive relationship between capacity analysis and improved educational outcome. Also, the value of t-

cal. of 6.34 which was more than the value of t-crit. of 3.17 implied a significant relationship in teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria

HO₃: There is no significant relationship in teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria

Table 8. t-test of relationship in teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria

Variable	n	df	Cohen's D	r	t-cal.	t-crit.	Sig. Level	Decision
Capacity Planning	297	2	0.54	0.26	6.34	3.17	0.05	Significant Relationship
Educational Outcome	258	553						

In table 8, the value of Cohen's D of 0.54 implied a medium effect and the correlation value of r=0.26 indicated a low positive relationship between capacity planning and improved educational outcome. Furthermore, the value of t-cal. of 6.34 which was more than the value of t-crit. of 3.17 also showed a significant relationship in teacher's capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria

HO₄: There is no significant relationship in teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria

Table 9. t-test of relationship in teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria

Variable	n	df	Cohen's D	r	t-cal.	t-crit.	Sig. Level	Decision
Capacity Tuning	297	2	0.62	0.29	7.14	3.17	0.05	Significant Relationship
Educational Outcome	258	553						

It was revealed in table 9 that the value of Cohen's D of 0.62 showed a medium effect and the correlation value of r=0.29 also indicated a low positive relationship between capacity tuning and improved educational outcome. In a related manner, the value of t-cal. of 7.14 which was more than the value of t-crit. of 3.17 indicated a significant relationship in teacher's capacity tuning techniques for improved educational outcome of Private and Public students in secondary schools in Nigeria

HO₅: There is no significant relationship in teacher's demand management techniques for improved educational outcome of private and public students in secondary schools in Nigeria

Table 10. t-test of relationship in teacher's demand management techniques for improved educational outcome of Private and Public students in secondary schools in Nigeria

Variable	n	df	Cohen's D	r	t-cal.	t-crit.	Sig. Level	Decision
Demand Management	297	2	0.65	0.31	7.68	3.17	0.05	Significant Relationship
Educational Outcome	258	553						

Table 10 indicated that the value of Cohen's D of 0.65 implied a medium effect and the correlation value of r=0.31 also showed a low positive relationship between demand management and improved educational outcome. The value of t-cal. of 7.68 which was more than the value of t-crit. of 3.17 also showed a significant relationship in teacher's demand management techniques for improved educational outcome of private and public secondary school students in Nigeria

Discussion of Findings
Teacher's Capacity Monitoring Techniques
The average mean score of 2.44 indicated that the respondents disagreed on teacher's capacity monitoring techniques for improved educational outcome of private and public secondary school students in Nigeria. This outcome aligns with the outcome of a related study carried out by Ladwig (2005) which showed that there was need for pedagogy audit for a successful capacity monitoring. This means that the enforcement of capacity monitoring technique is still lacking in most educational institutions. However, as indicated in the grand mean of the respondents, teachers in Private showed more commitment to capacity monitoring techniques than those in Public. The only point of agreement was that the respondents both agreed that they provide regular constructive assistance to underperforming students. This is done to assist these students improve in their academic performance.

However, in the area of rewarding innovative ideas, sharing ideas and methods and creation of informal groups, teachers in Private indicated that they agreed on these items as practiced for improvement in the educational outcome of their students. This implies that teachers in Private share relevant ideas with their students as well as allow them create informal groups that will enable them improve in their educational outcome. Further findings showed that these teachers do not have mechanisms in place to get feedback from their students. This no doubt will have negative consequence on the performance of these students. Similar study carried out by Mngomezulu (2015) also agreed that there are some level of laxity and lack of decisiveness in the extent of implementation of capacity monitoring strategies. It is therefore important for teachers in Private and Public to develop as well as implement relevant capacity monitoring techniques to improve the educational outcome of their students.

Teacher's Capacity Analysis Techniques
It was revealed from the findings of the study that the teachers used for the study averagely disagreed on teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria.

However, the private teachers agreed while the public teachers disagreed on teacher's capacity analysis techniques for improved educational outcome of private and public secondary school students in Nigeria. This implied that private teachers were better at enforcing capacity analysis techniques for improving the educational outcome of their students than the public teachers. Similar study conducted by Lindfeldt (2015) showed that the application of capacity analysis techniques helps in the proper evaluation of future objectives. This may explain why students in private secondary schools who are taught private teachers perform better in their educational outcome than students taught in public secondary school.

In all the items raised to measure teachers' capacity analysis techniques for improving the educational outcome of their students. Teachers who handle private students agreed that they engaged capacity analysis techniques such as giving students higher responsibilities, considering the suitability of the classroom, selecting the right tools and engaging regular competitive activities and this promotes the educational outcome of their students. In the study conducted by O'Neill, Schmidt and Warren (2016), it was revealed as part of the findings of the study that the application of capacity analysis techniques is responsible increase on size of outcome or products. However, the teachers disagreed that they engaged in adequate personal assessment programmes to improve their teaching competence. All of these go a long way to improve the educational outcome of their students and this is a practice that teachers in public secondary schools need to embrace.

Teacher's Capacity Planning Techniques

In the findings of the study, it was averagely agreed by the respondents of the study that teacher's engaged capacity planning techniques for improved educational outcome of private and public secondary school students in Nigeria. This finding slightly agreed with the outcome of a related study conducted by Sule, Ogbadu and Olukotun (2012) showed that 88.89% of the respondents were of the opinion that capacity planning is necessary for efficient and effective functioning among the Kogi State higher institutions. Therefore, teachers need to engage relevant capacity planning techniques as a way of achieving efficiency and effectiveness in service delivery which will in turn improve the educational outcome of their students.

In a related dimension, the capacity planning techniques engaged by private were not adequately engaged by teachers in public secondary schools and this can indeed have negative effect on the educational outcome of their students. Teachers in public secondary schools therefore need to embrace the capacity planning techniques engaged by their fellow private teachers as way of improving the educational outcome of their students. In their study, Nyhuis and Filho (2002) found out that capacity planning helps in the reduction or elimination of static and dynamic bottlenecks and this practice if engaged by public institutions will go a long way to contribute to the educational outcome of their students.

Teacher's Capacity Tuning Techniques

It was revealed in the outcome of the study that private and public teachers averagely agreed on teacher's capacity tuning techniques for improved educational outcome of private and public secondary school students in Nigeria. This finding was similar to the result of the study conducted by Jiang, He, Chen, Liu, Gao and Zhao (2020) which showed that tuning strategy achieves new state-of-the-art

performance on a number of tasks. However, teachers in Private agreed on all the items raised such as the assessment and categorization of student problems, measuring students' performance before modifying the curriculum, identifying and eliminating students' educational bottlenecks, engaging teaching strategies that will improve students' performance as well as identifying factors that influence students' performance. These practices go a long way to improve the educational outcome of students, but teachers in public secondary schools do not appropriately engage these techniques which are counterproductive to their service delivery.

It is important based on this premise that teachers of public secondary schools need to embrace available capacity tuning techniques as this will assist them to achieve better educational outcomes like other students in private secondary schools. Supporting this position, Bar-Hillel, Di-Nur, Ein-Dor, Gilad-Bachrach and Ittach (2007) quipped in the outcome of their study that tuning policies improves outcome more than 20% while in other cases it is about 40%.This finding no doubt points to the fact that when teachers engage capacity tuning strategies irrespective of the discipline, there is bound to be an improvement in the educational outcome of their students which is a benefit that public secondary schools can draw from if these techniques are adopted.

Teacher's Demand Management Techniques

In the findings of the study, it was averagely disagreed that teachers in private and public secondary schools engaged demand management techniques for improved educational outcome of private and public secondary school students in Nigeria. On the other hand, there was difference in opinion of teachers in private and those in public secondary schools on the extent to which these techniques were engaged. Related study carried out by Ali, D'Amours, Gaudreault and Carle (2018) showed that there is the potential to improve the performance of the demand management process of any organization by adhering to priorities. This is a practice that teachers in private and public secondary schools need to adapt to for improvement in students' educational outcome.

The teachers jointly disagreed that they regularly engaged all educational stakeholders in their services and that they have a means of publicizing their educational activities. There was a related study carried out by Alonso, Verdun and Caro (2013) which showed that there was need for the design of a global framework covering all three levels of demand management process which are strategic, tactical and operational. This practice will help to ensure that all employees adopting this technique will be able to improve on the quality of their service delivery and the performance of their students in particular.

Conclusion

The concept of capacity management has been in use in the area of science and technology for a long time. Capacity management has been used and has contributed immensely to output, performance and productivity across different sectors of the global economy. This phenomenon has been gaining increasing attention in the field of education as a tool for increasing individual and institutional performance. However, it was revealed in the study that there is a difference in the extent to which educational stakeholders have accepted this practice. The study has been able to show that employees in the same organization still exhibit different

disposition towards the adoption of capacity management techniques for improving the educational outcome of students.

Over the years, there has been a notable difference in the educational outcome of students in private and public secondary schools. This study has been able to suggest that the difference in the educational outcome of these students may be due to the capacity management techniques engaged by their teachers in the school system. It was revealed in the study that teachers in private and public secondary schools differ in their application of capacity monitoring, capacity analysis, capacity tuning, capacity planning and demand management techniques. These techniques have great influence on educational outcome as it has in the field of science and technology but has been duly embraced by teachers in private than those in public secondary schools.

Improvement in the educational outcome of students in public secondary schools can be at par with that of students in private secondary schools if teachers in the public secondary schools make concerted effort to engage these capacity management techniques in their teaching and learning activities. Educational outcome, output and productivity can be attained if all employees particularly teachers engage these techniques in the course of discharging their duties. In the long run, it is certain that if teachers irrespective of their areas of discipline engage relevant capacity management techniques, performance is expected to increase in the long run. However, every stakeholder in the education system have a role to play in achieving this objective. Students, teachers, school administrators and the government must develop the right skills and knowledge, engage available tools, create an enabling environment and make relevant policies respectively for the capacity management techniques employed during teaching and learning activities to contribute to improvement in the educational outcome of students in both private and public secondary schools concurrently.

In line with the findings of the study, relevant recommendations for each of the issues discussed were highlighted as follows:

1. The government and school owners need to provide relevant monitoring devices for teachers in the various areas of specialization which can be used to measure the capacity of students. This will help these teachers to be able to quickly identify students who are in need of further educational aid and provide remedial education when and where necessary.

2. Government regulatory agencies need to take the issue of school supervision seriously. There should be provision for internal and external supervision where teacher's capacity analysis techniques for student's academic performance can be easily assessed to ensure that the right educational goals and objectives are achieved.

3. There is need for schools to draw out short, medium and long term educational objectives which will guide the academic activities of teachers. These objectives will guide teachers' capacity planning techniques so that intended educational goals and objectives can be achieved both in the short and long term.

4. Teachers need to collaborate with their students and other educational stakeholders such as educational planners to assess the capacity of students and design measures for dealing with students learning difficulties so that

the goals and objectives of education will not just be actualized but will be improved upon on a regular basis.

5. There is need for establishment of an education-labour market organization that will moderate the relationship between the schools and the labour market. This organization will guide the school on the demands of the labour market as well as engage students who are graduated from the secondary schools into relevant sectors of the labour market where they will make meaningful contribution to the society.

References

Ali, M. B., D'Amours, S., Gaudreault, J. & Carle, M. A. (2018). Configuration and evaluation of an integrated demand management process using a space-filling design and Kriging metamodeling. *Operations Research Perspectives, 5*, 45-58

Alonso, I. A., Verdun, J. C. & Caro, E. T. (2013). Case study of strategic IT demand management in organizations: Exploratory results. *Procedia Technology, 9,* 900-909

Babalola, J. O. (2018). Comparative study of performances between private and public schools in English Language programme. *Asian Journal of Humanities and Social Studies, 6*(1), 25-33

Bar-Hillel, A., Di-Nur, A., Ein-Dor, L., Gilad-Bachrach, R. & Ittach, Y. (2007). *Workstation capacity tuning using reinforcement learning*. Retrieved from file:///C:/Users/HP/AppData/Local/Temp/Workstation_capacity_tuning_using_reinforcement_le.pdf

Croft, A., Coggshall, J. G., Dolan, M., Powers, E. & Killion, J. (2010). *Job-embedded professional development: What it is, who is responsible, and how to get it done well*. Retrieved from https://files.eric.ed.gov/fulltext/ED520830.pdf

Croxton, K. L., Lambert, D. M., García-Dastugue, S. J. & Rogers, D. S. (2002). The demand management process. *The International Journal of Logistics Management, 13*(2), 51-66.

Hervie, D. M. & Winful, E. C. (2018). Enhancing teachers' performance through training and development in Ghana Education Service: A case study of Ebenezer senior high school. *Journal of Human Resource Management, 6*(1), 1-8.

Jiang, J., He, P., Chen, W., Liu, X., Gao, J. & Zhao, T. (2020). *SMART: Robust and efficient fine-tuning for pre-trained natural language models through principled regularized optimization*. Retrieved from https://arxiv.org/pdf/1911.03437.pdf

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.

Ladwig, J. G. (2005). Monitoring the quality of pedagogy. *Leading & Managing, 11*(2), 70-83.

Lalor, J. P., Wu, H. & Yu, H. (2017). *CIFT: Crowd-informed fine-tuning to improve machine learning ability*. Retrieved from file:///C:/Users/HP/AppData/Local/Temp/Improving_Machine_Learning_Ability_with_Fine-Tunin.pdf

Lindfeldt, A. (2015). *Railway capacity analysis: Methods for simulation and evaluation of timetables, delays and infrastructure*. Retrieved from http://www.diva-portal.org/smash/get/diva2:850511/FULLTEXT01.pdf

Mijinyawa, M., Yeldu, Y. M., Umar, Z. & Hussaini, H. B. (2017). Comparative analysis of the academic performance of public and private senior secondary school students in science in Birnin Kebbi Metropolis, Kebbi State, Nigeria. *The Beam: Journal of Arts & Science, 11*, 1-11.

Mngomezulu, N. M. (2015). *Strategies of monitoring teaching and learning: A school management team perspective* (Unpublished Master's Thesis of the Department of Educational Leadership, Management and Policy, University of Kwazulu-Natal, Durban, South Nigeria).

Nyhuis, F. & Filho, N. A. P. (2002). Methods and tools for dynamic capacity planning and control. *Gestao & Producao, 9*(3), 245-260

O'Neill, M., Schmidt, C. & Warren, G. (2016). *Capacity analysis*. Retrieved from file:///C:/Users/HP/AppData/Local/Temp/CapacityAnalysis-CIFR-December2016FINAL.pdf

Sajid, M. (n.d.). *Strategic capacity planning*. Retrieved from https://www.academia.edu/9568618/Capacity_Planning_and_Analysis

Sule, J. G., Ogbadu, E. E. & Olukotun, G. A. (2012). Capacity planning and its implications on the infrastructural development needs of some selected higher institutions in the eastern senatorial district of Kogi State. *Global Journal of Management and Business Research, 12*(23), 62-80

Utley, M. & Worthington, D. (2012). *Capacity planning*. Retrieved from https://pdfs.semanticscholar.org/5aaf/77fc62cb49baff0deb7c3f786663c7b9b69e.pdf

Yilmaz, F. & Alouini, M. (2010). A unified MGF-based capacity analysis of diversity combiners over generalized fading channels. *IEEE Transactions on Communications, 10* (20), 1-26

SEARCHING FOR ESP TEACHING MODELS TO MATCH THE TEXT-BASED INSTRUCTION FOR SENIOR SECONDARY VOCATIONAL SCHOOLS

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Abstract
Students at vocational high school are expected to have proper English proficiency along with their vocational skill. However, Indonesian government has already set the teaching model to be Text-based Instruction (TBI) which is same with senior high school. As a result, English lesson for vocational school indicated as less purposeful. Therefore, this paper is intended to design appropriate teaching model in ESP to be integrated with the teaching cycle in TBI. By reviewing underlying theories from TBI, and Teaching model in ESP, this paper proposed two teaching model combined with TBI. The first integration is integrating TBI with the practices of Flipped Learning Model in which the activities are divided into two phases namely before classroom time and inside classroom time. The second integration is integrating TBI with the phases of Project Based Learning in which the activities will be divided into four phases. The two proposed teaching model will be useful for promoting writing activities for students. Finally, by proposing those teaching models, it is expected that the practice of English lesson in vocational school will meet its objectives.

Keywords: ESP, teaching model, text-based Instruction, vocational school

Introduction

Constructing an appropriate English teaching model in senior secondary vocational school is needed since the demand of English is getting increased since the demand job's requirement includes English to keep up the employee with the global situation (Akbar & Sulistyo, 2018). As a result, formal education system takes an account to fulfill two demands which are to fulfill the demand of professional and skillful workers and fulfill the need of worker with appropriate English skill. In Indonesia, the government has constructed the need of professional workers by establishing a vocational school or SMK (*Sekolah Menengah Kejuruan*) as a part of vocational education (Khosiyono, 2018).

Furthermore, in government' law, to be exact Permendikbud No. 70 Year 2013 stated that field in Vocational School include Tourism, Arts and Crafts, Performing Arts, Fisheries and Maritime Affairs, Technology and Engineering, Information and Communication technology, Health (Nursing School), Agribusiness and Agrotechnology-technology, Business and Administration.

Besides, it also mentions that the teaching and learning process of vocational school is focused to enrich students in preparing the graduates with the skill in line with their field and support them in gaining supporting skill for any career. The implementation of teaching practices in vocational high school are divided into three integral parts namely *Kelompok Mata Pelajaran Wajib A, Kelompok Mata Pelajaran Wajib B,* and *Kelompok Mata Peminatan (Kejuruan).* Furthermore, English subject can be found in Kelompok Mata Pelajaran A in which English is taught to all grade with 45 minutes for each session (*jam pelajaran).*

In the case in Indonesia, in Permendikbud No. 37 Year 2018 stated that the implementation of English subject in vocational school is equal with the English practices in high school (SMA/MA) in terms of core competencies (Kompetensi Inti) and base competencies (Kompetensi Dasar). Since there is a sort of equality, therefore, the English subject in vocational school also follows the practice of senior high school which implement text-based instruction / genre-based instruction (Anggraeni, 2016). Additionally, the use of teaching material is also same in terms of course book (Mahbub, 2019). Furthermore, English lesson in vocational school should be able to present the real practice of their major. In other words, the English lesson should be in a form of English for Specific Purposes where the lesson is intended to meet up the needs of students and other stakeholders to connect for work or study purposes in specific field (Vogt & Kantelinen, 2013). In short, the vocational school student must be trained to use English in a specific context based on their field (Liu, Chang, Yang, & Sun, 2011). Furthermore, the teacher should be able to present the cycle process of text-based instruction in which consist of a cycle proses consisting of four phases. Gibbons (2015) stated that the cycle proses consist of four phases namely building the field; modeling or deconstructing the genre; joint construction; and independent writing. By doing those four phases, teacher must be able to scaffold vocational school's students to meet their English needs and vocational area.

However, the real practices showed different scenes of English lesson. Mahbub (2019) found that the English teachers in vocational school use the same course book as senior high school students used. Besides, he also found that grammatical learning and reading exercise are being emphasized to the students in which the topics do not match with their vocational area. In addition, the researcher also has conducted an informal interview with the English vocational school's teacher found that the teaching practice was same with the senior high school students. The teacher argued that the regulation said that English lesson should be presented in a form of text. To find the real practice, the researcher also conducted an informal interview with the vocational school's student in which they also said so. Even worse, the learning processes tend to be reading comprehension activities in which students are given text to respond some question afterwards. In short, the practice of English teaching and learning in vocational school does not match with students' vocational area. Since the regulation mentioned that English lesson should be taught using text-based instruction, so the presence of English for specific purposes in secondary vocational school in Indonesia has a small chance.

Defining Text-Based Instruction

Since the use of text-based instruction (TBI) has declared by the government as the way to conduct English lesson, therefore defining TBI becomes an integral

part of this paper. Sadeghi et al. (2013) mentioned that TBI will be close related with the writing skills and the explanations of textual structure and linguistic aspects of specific genres. Therefore, the terms of TBI can be equalized with the terms of Genre-based Instruction in which English is taught through some sort of text. Another definition of TBI can be found as the practice of language that integrates an interpretation of genre and genre of teaching in the EFL classroom (Hammond & Derewianka, 2001). Tangpermpoon (2008) mentioned that the used of TBI in English lesson is used to teach writing where the activity integrates the understanding of a particular genre and its communicative objective. Additionally, Gibbons (2015) stated that TBI promotes the explicit teaching practices which means that students are persuaded to indicate on how language is applied for a variety of functions. It can be interpreted that different text will have different ways in terms of organizing and purpose. TBI indicates that to connect requires to be able to utilize numerous sorts of spoken and written texts in a context based its used (Arimbawa, 2012). Therefore, TBI can be described as the teaching process done by teacher in the form of giving students some text or genre to promote spoken and written skill.

Teaching Cycle in Text-based Instruction

The practices of TBI have four phases or it can be notice as teaching cycle of TBI (Derewianka, 1990; Gibbons, 2015). Each of phase will scaffold the learner to be able to produce their writing. Those four phases can be recognized as building of the field, modeling of the text, joint construction, and independent writing phases (Gibbons, 2015). Firstly, building the field is a phase that aims to build and to ensure students' knowledge about what they are going to do. The focus of this activity is to ensure the content and information of text by speaking, listening, reading, taking note and other research activities to gain knowledge. In addition, brainstorming, predicting, and giving related picture to the text can be said as the building knowledge activities (Arimbawa, 2012). The second phase is the modeling the text/genre. This phase will ensure that students should be familiar with the objectives of the text, structure, and language features of the text being taught by teacher (Gibbons, 2015). The activities for this phase can be presented as introducing the text, giving example of the text, and discussing about the text either orally or written form (Arimbawa, 2012). The third phase is joint construction. This process involves teacher and students to compose the text based on the fundamental term in the previous activities. The activity can be presented where students construct their own writing with the teacher's guidance by monitoring students' content and language features (Gibbons, 2015). Then, when it comes to the last phase, the process is called independent writing. In this last process, students will construct their own paper without teacher's guidance (Gibbons, 2015). The process will consist of brainstorming, reconstructing, drafting, evaluating, and finalizing. In addition, those processes are grounded by Australian genre approaches in which initiated by Derewianka (1990) and others. Moreover, in English for specific purposes, Master (2005) stated that ESP teachers are motivated to use Australian genre approaches to teach in academic and professional context.

Furthermore, those all of four phases cannot be presented in a single meeting or lesson (Gibbons, 2015). Otherwise, the processes should be a deliberate process where the students build, understand, and construct their own writing. In other

words, during the process, it is necessary to monitor students' cognitive skill in which it should be getting increased when teachers apply this approach.

Defining ESP

English for Specific Purposes (ESP) can be described as the branch of English as Second Language (ESL) and English as a Foreign Language (EFL), which also the branches of English Language Teaching (ELT) (Irshad & Anwar, 2018). Moreover, the presence of ESP also has been influenced by the rapid globalization that learners' professional will be better recognized if using English (Trujeque-Moreno et al., 2021). Prior to that, Hutchinson and Waters (1987) in Trujeque mentioned that ESP can be defined as an approach that is used to meet learners' need in which the ways of defining language, models of learning, and needs analysis are essential elements for course design. Moreover, the ESP approach was originally developed in the early 1960s to explain the rules of the English grammar (Trujeque-Moreno et al., 2021). In a contradiction, Wette (2018) stated that the presence of ESP was a respond to the need for targeted support for non-English-speaking learners studying or working in English-speaking countries and as part of aid project in developing countries in the late 1960s.

Over its history and background, it has continued as a response to the ever-changing demands of the globalized world, moreover, the ESP has switched to a special approach that addresses specific needs, especially the needs of professionals. Furthermore, ESP focuses on meeting the specific language learning needs of learners in a particular discipline or profession (Hyland, 2007). However, in some previous research, the definition of ESP is still debatable since the presence of English for General Purposes (EGP) (Bojovic, 2006). Furthermore, the distinction point can be clearly seen in the goals of the course. For instance, Islam (2014) mentioned that the goal of EGP is students' general English ability mastery, while in ESP students are expected to master the specific skills and needs of learners, based on a thorough analysis of the learner's professional / academic needs. Therefore, the researcher argue that ESP can be assumed that ESP is an approach to seek the mastering subject matters through English as medium instructions.

Characteristics of ESP

As mentioned in its background of ESP, the practice of ESP can be recognized from its purposes. (Salmani-Nodoushan, 2020) stated that many ESP practitioners of ESP determined the goal of the learning by analyzing the need of the learner. Furthermore, there are some mainly topic's focuses within an ESP program highlighted by him which are paper presentation, formal writing, speaking competence, and attending topics. Furthermore, Carver (1983) in Bojovic (2006) argued that there are three common characteristics of ESP namely authentic material, purpose-related orientation, and self-direction. Firstly, authentic material can be easily found in the ESP classroom since the goal is to fill the need of English in the real-world, so the offered material must be close with the learners' daily activities. Secondly, purpose-related orientation can be described when the teacher sets the classroom task and conditions into a real-world simulation. For instance, the learners are required to simulate a conference, business telephone, writing a letter, reading, writing paper, and so on related to daily activities. Lastly, self-

direction means that ESP emphasized the learners into practitioner or user of the materials. Furthermore, the students are supposedly determining when, what, and how they will study. Even for a special case like the learners with high ability of it is necessary to learn how to access information in a new culture. Furthermore, since the global changing and the need of English is getting varied, so the type of ESP also is influenced by those certain conditions.

Another noticeable characteristic of ESP is the presence of Need Analysis. Furthermore, need analysis in ESP plays as pivotal assets in determining the directions in teaching in which the learners are lacking the skills. Supported by Taillefer (2007) and Cowling (2007), the success of teaching and learning process in ESP is relied on how proper and much the need analysis. By doing so, the learners will match what they want, and the teacher will easily recognize what the learners' need. The next step is the analysis from the teacher in which teachers determine the method, material, and the activity in teaching and learning process. Therefore, the materials and the practice in ESP should relate with the career of the students after the programs (Rhahima et al., 2021)

Learners' Characteristics in ESP

In some previous studies, the characteristics of learners in ESP are not clearly stated by the researcher. Instead of emphasizing the characteristics of ESP learners, most of researchers tend to be describing the characteristics of ESP teachers (Bujovic, 2006; Norton, 2018). Therefore, there is a limit explanation about the nature of ESP learners in written form. The researcher indicates that since the goal of ESP is teaching English to specific subject matters, so the characteristics of ESP learners are entailed with the definition of ESP. Furthermore, the interest of ESP gains the wide-ranging learners who are categorized as older children or adult with various English level proficiency (Wette, 2018). Moreover, she asserted that the duration of ESP courses is shorter than EGP since the goal is only on certain skills, for instance, doing presentation, writing email, and business call.

Furthermore, since the description of ESP learners is close related with the adult learners or older children, the researcher decides to describe ESP learners as the adult learners. Therefore, Kapur (2015) mentioned that the term of adult learner can be applied to those adult people who is involve in a systematic learning process either formal or non-formal. Moreover, they can easily deal with the diverse groups in terms of gender, caste, class, religion, ethnicity from each other towards their learning need. Besides, the adult learners also rely on the experience and environment perspective. Kapur (2015) stated that the opinions, values, and beliefs of adult learners define their daily activities. They pursue English based on their goal and relevancy-oriented related to their daily activities while the activities are emphasized the practical and purposeful activities. In terms of English learning goals of adult learners, Alhasov et al. (2020) stated that the goal of English learning tends to be self-development and self-improvement to be more competitive in the workplace market. Besides, adult learners are totality different with young learners, they, furthermore, have already had the background knowledge that have been formed previously (Alhasov et al., 2020). Therefore, instead of teaching from the basis, teachers are supposedly teaching them beyond the basis. Again, the need of need analysis is needed to determine the methods.

Furthermore, Brown and Lee (2015) noticed the nature of adult learners from conceptual thinking capability, interest span, self-confidence, and professional attention. Moreover, teaching adult learners are relied on context segmented. In other words, authenticity and meaningfulness are highly recommended to be promoted with some grammatical learning in it. Teachers may not be afraid about the boring material because adult learners can have longer attention even though the materials are not interested to them. Furthermore, the ego of adult learners is noticed by Brown and Lee (2015) is quite high in learning process, but they are sensitive in terms of emotional. Lastly, adult learners are future oriented. In other words, they are learning English because they need English in their professional career. Therefore, need analysis in ESP classroom is needed.

Teaching Model in ESP

Along with the development approach in ESP, it is also followed by the teaching model in ESP. The researcher prefers to use terms 'teaching model' rather that 'teaching method' since the manifestations are same which is teaching the learners. Furthermore, since the learners' needs in ESP are various, so Kenny (2016) stated that rather than pursuing the 'specific' method to teach learners, it had better to provide the 'appropriate' method by recognizing the needs, time, demand, and field to be fulfilled. In other words, there is no best suitable teaching model in ESP. Therefore, in classifying the teaching model, the researcher arranges the list based on the current and the impactful teaching model of ESP based on empirical research from previous research. In addition, at the end of this sub chapter, the researcher also will show the need analysis of ESP in Asian Context in which showing the most preference skills to be acquired based on the need of ESP learners. Besides, it also will lead the re-designing model of teaching ESP in the following chapter in this research.

Flipped Learning in ESP Classroom

For more than two decades ago, the traditional method is running together with the development of technology. Hence, it influences the way of traditional teaching to be more entailed with the technology. The presence of computer assisted language learning makes the integration of traditional language learning and technology becomes inevitable (Salem, 2018). Besides, it also gives the learner new learning experiences and able to maximize the students' engagement by providing attractive learning in different environment. The underpinning of flipped learning comes from the approach of blended learning where people belief that both traditional teaching and digital tools can be integrated to teach subject matters (Salem, 2018). Moreover, the terms of flipped learning are also getting dynamic. It can be recognized as "flipped learning", "inverted learning", "flipped teaching" which was coined by Jon Bergman and Aaron Sams in 2007 at Colorado, US (Lee, 2017). The concept of Flipped Learning (FL) in the classroom is that the initial material will be given before the classroom learning in the form of video, or other pre-class learning materials then it will be discussed by students in the class-time situation (Lee, 2017). Furthermore, in FL, in-class time will be used for student-centered learning to solve the problem, to do experiments, to discuss with the other students and to do collaborative work (Long et al., 2016).

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Since the introduction of FL, the method has been widely used by some practitioner and teachers in many fields such as history, math, arts, English, special education, and physics educations (Lee, 2017). Besides, the manifestation is also getting increased. Lee (2017) mentioned that in the range of 2016 until the first half of 2017 there are 86 articles discussed about the issues and the influence of FL. Particularly in English, to be exact in ESP context, there are myriad research focusing on FL in ESP classroom. For instance, Humeniuk et al. (2021) found that the FL can be used to increase students' listening skill in ESP. Their research was about testing the FL which combined with the TedTalks Listening materials in Agrarian Engineering and Electrical Engineering and Energy students. By using experimental research, the finding revealed that the use of FL and TedTalks empirically proofed increased the students' listening skills. Another research focusing on the increasing of writing skills, Salem (2018) did research about the impact of FL towards Functional writing of third year business administration students in Sadat Academy for Management Science, Egypt. The result found that students functional writing skills were getting increase comparing with the control group without attempting the FL method. Besides, the FL also minimized the writing block in students' writing activities.

Likewise, Karapetian (2020) also evaluated the FL model to increase the students' critical thinking in students' paper. By conducting the experimental research to Economic Students in Ukraine, it revealed that FL model were able to increase students' critical thinking by cognizing their paper. Besides, the practices of teacher-centered learning were replaced by FL model by providing the learners about true-to-life business world language environment through problem-solving based in class-time learning. Another focus research by Lee (2017) who conducted research about the impact of FL in preparing students TOEIC test. The result of this study indicated that the learners revealed that FL brings a positive learning experience with their high level of satisfaction in learning using FL.

By recognizing the prior studies, the flipped learning model has been widely used by teachers and practitioners in ESP classroom. Besides, the benefits are also varied which indicate that flipped learning model are applicable in ESP Classroom particularly for listening and writing skill learning. However, the materials and the readiness of teachers and students also must be prepared to reach the ideal conditions or goals.

Collaborative Learning in ESP Classroom

The next method that has been widely used by the practitioners and teachers in the ESP context is the collaborative learning. Recognizing the terms of collaborative, the learners will be able to learn and work together in a group to discuss, practice and sharing with their peers. Moreover, each group member will have their learning goals in the group, in other words, it can be recognized that the learners are independent when they are in a group (Herrmann, 2013). However, attempting the collaborative learning is not merely about group work. Furthermore, the teachers must recognize, set, and design well-learning environment and provide meaningful interaction among group member in the group (Huo, 2015). Furthermore, the teachers also must make sure that learners will have chance to engage in group discussion (Lin et al., 2020).

Some scholars have already attempted the practice of collaborative learning in many contexts and skills to prove the impact of collaborative learning. Lin et al. (2020) did research about collaborative learning (CL) in ESP context to increase learners' listening and reading skills. The result revealed that the listening and reading in experimental group were getting increase along with the self-efficacy of the students comparing with the individual learning method. Another research also proofed that collaborative learning could increase speaking skills in ESP classroom. The research from Novitasari (2019) revealed that the learners in ESP classroom felt more comfortable when the teacher used collaborative learning. Besides, the learners also could work together, got meaningful feedback, and triggered their confidence to give feedback in oral form. The influence of collaborative learning in increasing listening skills also has been proofed by (Liu et al., 2017). By combining mobile applications and collaborative learning activities, ESP students' listening skills was found getting improved. Besides, the learners also showed the positive attitudes towards the combination of mobile application learning and collaborative learning activities during the research.

Noticing the prior studies, the collaborative learning can be categorized as an applicable learning method in ESP classroom. Moreover, the collaborative learning can be used to emphasize the listening and speaking skills learning. However, the teachers' role and material should be determined first based on the need of analysis result before the classroom teaching and learning.

Problem Based Learning in ESP Classroom

In past a decade ago, the use of problem-based learning also has been appeared in ESP context. The use of problem-based learning is a flourishing method that promotes critical thinking and analytical thinking (Caspary & Wickstrom, 2017). Meanwhile the concept of problem-based learning is to engage leaners in a learning situation where they will be given a real problem to be solved. The starting point of the use of problem-based learning started when the notion of language learning must be strengthened by involvement with a wider range of subjects at the same time (Caspary & Wickstrom, 2017). Therefore, utilizing PBL and ESP approaches that shift the perspective in which we extend educational and occupational fields will lead to substantial endeavors and improvements in both areas.

Practically, the implementation of problem-based learning emphasizes the combination of language and professional field in which language skills are gained through group dynamic, workplace reality, and content are knowledge in a form of case or problem. Furthermore, problem-based learning shows the positive impact for the learners. For instance, Salleh et al. (2018) revealed Malaysian ESP learners' perspectives about problem-based learning in ESP classroom in which learners stated that problem-based learning is impactful for motivating leaners to learn and assisting learners in learning process. Besides, the finding revealed that most learners agree to use problem-based learning in the classroom.

Furthermore, a quite distinction with the previous teaching model, the use of problem-based learning can be categorized as less used by practitioner and teachers in ESP. However, the presence of problem-based learning in ESP is inevitable. Even though the users are minimal, problem-based learning is worth it to be promoted in ESP classroom.

Communicative Learning in ESP Classroom

Communicative language teaching (CLT) always be a phenomena and most used teaching method in language learning including ESP classroom language learning context. One of needs in English learning is mastering the speaking skill which the underpinning point of CLT. Moreover, Adronova (2020) noticed that the modern ESP classroom have several aspects in its process including the fulfilling the communicative skills of the learners. Therefore, the presence of CLT in ESP classroom is inescapable.

Furthermore, the practices of CLT also have been implemented by practitioners and teachers in ESP classroom. For instance, the activity of role-play, conversation, and speaking practice skills are used in ESP classroom. Moreover, some previous research also proofed the effectiveness of CLT in ESP Classroom. In short, Mannahali et al. (2020) stated that communicative method can increase students' English competence in Translation class. In addition, Febrijanto (2017) mentioned that CLT is worth to be promoted in nursing class by his research found that learners accepted the CLT materials, and it was suitable as autonomous learning materials.

In other hand, the researcher tries to correlate the CLT and ESP in which has same similarities. For instance, the authentic material in CLT is suitable for the learners because it is close related with them. Besides, the activities are also can be set into their daily activities. Therefore, the use of CLT in ESP classroom is easily found. However, the role-play activities should be emphasized into meaningful activities so that the learners will be able to practice in their daily life.

Project Based Learning

Another teaching model found in ESP classroom is the project-based learning (PBL). If we notice the name of PBL, it will be easily noticed as the teaching model which requires students to produce or to create something in the form of project. However, PBL is beyond than that, Pastor et al. (2018) stated that PBL will give both general and specific picture about the practice of communication and interaction where happens among students to explore, gain, brainstorm and build understanding on a project. Furthermore, Wiranegara (2019) stated that PBL gives students chance to explore and deep their ongoing knowledge through experimental project.

In ESP context, the use of PBL has gained several positive voices such as increasing students' writing skills (Budianto & Suparmi, 2017; Foulger and Jimenez-Silva, 2009; Hasani et al., 2017; Ismuwardani et al., 2018), speaking skill (Zuana, 2016), vocabulary (Shaalan, 2020), and promote meaningful learning (Wiranegara, 2019). By seeing the benefit of PBL in classroom, therefore, it can be found as one of applicable teaching method in the context of ESP. Furthermore, the skills can be enhanced by the PBL noticed as writing and speaking skill.

After providing the existing theories and research result, English teaching in senior secondary vocational school should be able to accommodate English along with their vocation skill. Therefore, this paper is intended to reconstruct and integrate teaching models to match with the text-based instruction in senior secondary vocational school in Indonesia. Moreover, this research question of this research can be noticed as how should the teaching of English to vocational school students be designed to ensure the learning of producing the intended vocational

English text as a cycle of scaffolding processes? This paper will propose the integration of text-based instruction (TBI) and some teaching models used in ESP classroom. Therefore, the following discussion will discuss about ESP, learners in ESP, text-based instruction, teaching models in ESP, and some related things relate to the topic of this paper.

Method

This research employed article literature review research by following the four steps of conducting literature review research by Snyder (2019). Those four steps can be defined as designing the review, conducting the review, analysis and writing up the review. The data in this literature review research used some secondary data taken from journal databases such as Taylor and Francis, Emerald, Google Scholar, ERIC, JSToR, and both international and national journal databases. Moreover, the research articles used in this research were field research, literature research, and classroom practices research.

Furthermore, in finding the data, the researcher used some key words such as [teaching ESP], [teaching model in ESP], [Text-based Instruction], [English in vocational school] and combinations of those keywords. To keep the recentness, the data were set based on year publication in the range 2010-2021. Similarly, the use of books in this research also were set as recent as possible. In addition, even though there are some journal articles and books which are more than 10 years old, the contained knowledge in them has been broadly used by some scholars in their citations.

Findings and Discussion

Text-based Instruction and Flipped Learning Model

In modeling the learning process in ESP classroom particularly in speaking and writing skills, some studies mentioned that the implementation of flipped classroom model is powerful to boost learners' writing skills (Karapetian, 2020; Lee, 2017). Therefore, the first teaching model will integrate the process of text-based instruction with flipped learning model for teaching writing.
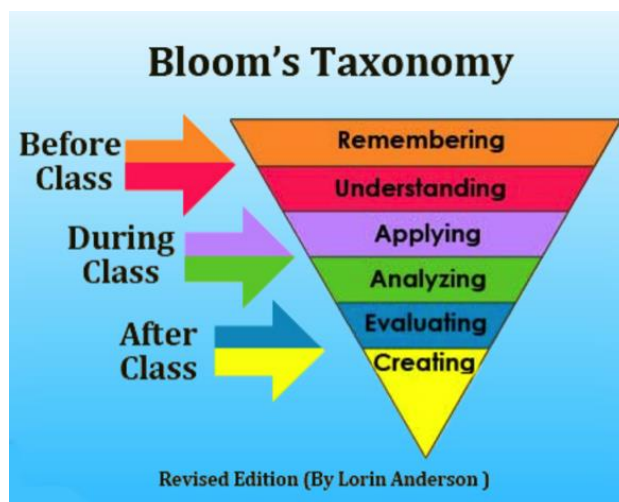

Figure 1. Flipped Classroom Model according to Medical Education Research and Development, Michigan State University (n.d.)

The learning model in flipped classroom model is different from traditional learning model. If the traditional learning model puts the lower and higher cognitive activity in the same place which is in the classroom, the flipped classroom does not. Moreover, the flipped classroom flips the learning process where the lower cognitive activities are put outside the classroom where the higher cognitive activities are put inside the classroom with peers and teachers (Medical Education Research and Development MSU, n.d.).

Recognizing the practice of flipped classroom, the process of giving reading or material can be done online or outside the classroom. Meanwhile the learners' practice should be done inside classroom with peers and teacher's guidance. Therefore, the steps are varied. The researcher found that there are no clear steps in terms of the amount of the steps. For instance, Sezer et al. (2017) mentioned four steps, Dunn (2014) mentioned six steps, and many others with dynamic the amount of the steps particularly technical steps. However, they put same basis which located the lower cognitive activities outside classroom and higher cognitive activities inside the classroom.

Then, when it comes to integrate the Flipped Classroom and Text-based Instruction, the researcher tries to separate some points in TBI and considering the implementation of FL. As mentioned previously, the outside classroom in flipped classroom's activities can be divided into outside and inside classroom which emphasize the lower cognitive activity outside and higher cognitive inside. The Building Knowledge of Field and Modeling of Text Phases from TBI can be done outside the classroom before in-classroom time. Gibbons (2015) stated the Building Knowledge and Modelling Text can be presented through reading. From that point, the teacher can give and assign students to read initial reading before the classroom.

Since the activities of joint construction of text and independent writing need the collaboration of teacher and student (Gibbons, 2015), so the activities can be done inside classroom in the classroom time. However, the learners are provided a follow up session first before in-time classroom. So, some unclear points can be solved before jump to the Join Construction of the Text and Independent Writing. Teachers also must make sure the readiness of the learners before the next phase so that the classroom learning objectives can be achieved using dual model classroom which are outside and inside time classroom. Therefore, the model can be seen as follows:
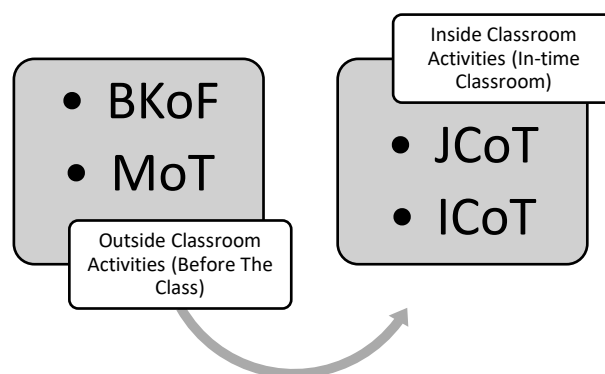

Figure 2. The Integration Model of Flipped Learning and Genre Based Approach

Furthermore, during conducting the model it is highly suggested to observe students in the three stages which are the pre-condition class, whilst class, and the post-class condition. However, the main point is not in the in-time classroom, instead, the crucial point is in the input session. Therefore, teacher must be aware of the students' readiness before in-time classroom. Besides, since one of the characteristics of adult learners is having better conceptual thinking ability (Brown & Lee, 2015), therefore, it is possible to them analyzing, evaluating, conceptualizing in the in-time classroom. Besides, adult learners tend to have professional attention in learning (Brown & Lee, 2015), so, bringing the practice to their learning process are preferable rather than presenting theory and material in them in-time classroom.

Text-based Instruction and Project Based Learning
Since the project-based learning (PBL) has its effect in ESP teaching practices, so it is possible to integrate the TBI with PBL for fostering vocational students. The nature of PBL explained by Patton (2012) seems to be matched teaching model for TBI. Moreover, Patton (2012) stated that there are three keys in PBL which can be recognized as the exhibition, multiple draft, and Critique. Particularly multiple draft phase, it will match with TBI since in TBI there is a process of students and teacher constructing the text together. That process can facilitate students to create better writing in every drafting process. Multiple draft phase is valuable to be one of personal assessment tools to improve students' cognitive skills (Patton, 2012).

Meanwhile in the step of PBL, it has five phases which are get the idea, design the project, tune the project, do the project, and exhibit the project (Patton, 2012). Get the idea phase can be understood as the initial process before making the project. Patton (2012) mentioned that in getting idea, the students can be given a question or brainstorm about what they are going to do. Then, the next is designing the project. This phase can be done by the students after they know what they will do in their project. The activities from this phase can be presented as articulating the way to finish the project and making simple mind map for mapping the way to do the project. After those two phases done, the next phase is tuning the project. This project will invite the students to work in pair in giving feedback from the planning that they have made. Students exchange idea and personalize their idea to other so other students will get new insight and wide array of plan for their project (Patton, 2012). The following phase is doing the project. Getting insight from previous phase will assist students to revise or internalize their process. Therefore, the next project should be the action in which students try to do what they have planned. The last project of PBL can be done by conducting exhibition. The exhibition phase will give students effect to present their best project. This last phase can be done by making a poster, distributing flyers, posting in social media or even broadcasting in television or local radio (Patton, 2012).

Furthermore, the integration of PBL and TBI can be seen in four stages. The first stage is the get the idea in which the activities will be BKoF and MoT. In this phase teacher tries to brainstorm students by giving model of the text and give them idea about what they are going to do. Then, the next stage can be said as the multiple drafting stage. In this stage, the teacher assigns students to make a mind mapping and construct the text together. However, in this stage teacher's role should not dominate the student's construction, so the students will explore the text mostly by

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themselves. The next stage is the action in which students work independently creating their writing without teacher's guidance. The last stage is the exhibition in which the implementation of PBL that order students to publish their writing. Moreover, to accommodate the exhibition stage, teacher may assign students to publish their writing in web 2.0, social media, and blog so that it will be accessible for everyone. In short, the integration of PBL and TBI can be seen as follows:
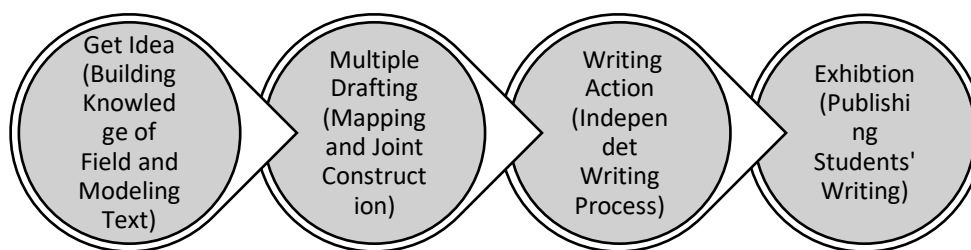

Figure 3. The Integration of Text-based instruction and Project Based Learning

Conclusion

The regulation from Indonesian government to apply text-based learning in vocational high school raises some issues to be done. The objective of English lesson in secondary school is equal with the English lesson in senior high school. To solve the issues, the Indonesian government should apply English for Specific Purposes in vocational secondary school. However, since the regulation mentions that the allowed teaching model is Text-based Instruction, so there must be an adjustment for English lesson in vocational school. This paper aims to search an appropriate teaching model to be matched with TBI. By reviewing the previous studies from articles journals, books, and trusted sources, the researcher proposed two integrations in TBI.

The first integration is integrating TBI with flipped learning model. The implementation from flipped learning which is dividing the practice into two stages namely before classroom-time and inside-time classroom were used to be integrated with TBI. The BKoF and MoT from TBI are located before the classroom in flipped learning, meanwhile the Joint Construction and Independent writing are located inside classroom time. The second integration is integrating the TBI with PBL. By integrating the phases in PBL, the integration creates four stages activities. Those stages can be noticed as get idea, multiple drafting, writing action, and exhibition process at the end of the stages.

By proposing those ideas, hopefully the English lesson in secondary vocational high school can be more purposeful and insightful. Besides, it is expected that the desired condition of English lesson in vocational school can be fulfilled so the students will have proper English proficiency beside their vocational skills. However, the proposal in this study needs to be evaluated whether the proposal is logically and practical applicable or not. Therefore, future researcher may try to implement the proposal in the classroom to know to what extent the

proposal is. By doing so, an appropriate teaching model in vocational high school can be developed to meet its purposes.

References

Adronova, E. (2020). Implementing communicative approach in ESP training as a pedagogical aspect at Uzbekistan universities. In *III International Scientific Congress Society of Ambient Intelligence 2020 (ISC-SAI 2020)* (pp. 222-228). Atlantis Press. https://doi.org/10.2991/aebmr.k.200318.028

Akbar, A. A. N. M., & Sulistyo, G. H. (2018). The current learning competences of English for vocational high school graduates: Do they really cater for the real-life professional needs. In *Proceedings of the International English Language Teachers and Lecturers Conference iNELTAL* (pp. 189-194).

Alhasov, Y., Verbytska, A., & Kolenichenko, T. (2020). Teaching English to adult learners within extracurricular activities at university: Barriers and motivation factors. *Advanced Education*, *7*(15), 12–19. https://doi.org/10.20535/2410-8286.195696

Anggraeni, F. M. (2016). *Learning English through text-based approach at vocational high school: Students' lived experience* (Master dissertation, Sanata Dharma University).

Arimbawa, I. N. (2012). Text-based approach to EFL teaching and learning in Indonesia. *Prasi: Jurnal Bahasa, Seni, dan Pengajarannya*, *7*(13).

Bojovic, M. (2006). Teaching foreign language for specific purposes: Teacher development. *The Proceedings of the 31st Annual Association of Teacher Education Conference*, 487–493.

Brown, H. D., & Lee, H. (2015). *Teaching by principles: An interactive approach to language pedagogy* (4th Edition). London: Pearson.

Budianto, L & Suparmi (2017). Using project based learning to develop ESP students' writing skill.

Caspary, M., & Wickstrom, C. D. (2017). Multicultural problem-based learning approaches facilitate ESP language acquisition. *International Journal of Learning, Teaching and Educational Research*, *16*(3), 1-14.

Cowling, D. (2007). Needs analysis: Planning a syllabus for a series of intensive workplace courses at a leading Japanese company. *English for Specific Purposes*,*26,* 426–442.

Derewianka, B. 1990. *Exploring how texts work*. Sydney: Primary English Teaching Association of Australia. Reprinted 1991. Portsmouth, NH: Heinemann.

Dunn, J. (2014). The 6-step guide to flipping your classroom. Retrieved from https://kitzu.org/flipped-classroom-model/

Febrijanto, Y., & Kurniajati, S. (2017). Developing ESP nursing based on communicative language teaching. *English Education: Journal of English Teaching and Research*, *2*(2), 62-37.

Foulger, T. S., & Jimenez-Silva, M. (2007). Enhancing the writing development of English language learners: Teacher perceptions of common technology in project-based learning. *Journal of Research in Childhood Education*, *22*(2), 109-124.

Gibbons, P. (2015). *Scaffolding language, scaffolding learning: Second Edition*. Portsmouth, NH: Heinemann. https://doi.org/10.1016/j.jeap.2011.09.002

Hammond, J & Derewianka, B. (2001). Genre. In Carter, R. and Nunan, D. *The Cambridge guide to teaching English to speakers of other language*. (pp.186-193). Cambridge: Cambridge University Press.

Hasani, A., Hendrayana, A., & Senjaya, A. (2017). Using project-based learning in writing an educational article: An experience report. *Universal Journal of Educational Research*, *5*(6), 960-964.

Herrmann, K. J. (2013). The impact of cooperative learning on student engagement: Results from an intervention. *SAGE Journals, 14*(3), 175-187.

Huo, H. T., Wang, S. M., Lin, P. C., & Chang, K. E. (2015). Exploring the learner's knowledge construction and cognitive patterns of different asynchronous platforms: Comparison of an online discussion forum and Facebook. *Innovations in Education and Teaching International, 52,* 610–620. https://doi.org/10.1080/14703297.2013.847381

Humeniuk, I., Kuntso, O., Popel, N., & Voloshchuk, Y. (2021). mastering listening comprehension at ESP classes using Ted Talks. *Advanced Education*, *8*(18), 27–34. https://doi.org/10.20535/2410-8286.226733

Hutchinson, T., and Waters, A. (1987) *English for Specific Purposes: A learning – centered Approach.* Cambridge: CUP.

Hyland, K. (2007). Genre pedagogy: Language, literacy and L2 writing instruction. *Journal of second language writing*, *16*(3), 148-164.

Irshad, I., & Anwar, B. (2018). English for specific purposes: Designing an EAP course for computer science students. *Journal of Education and Educational Development*, *5*(1), 156. https://doi.org/10.22555/joeed.v5i1.1533

Islam, M. (2014). The differences and similarities between English for Specific Purposes (ESP) and English for General Purposes (EGP) teachers. *Journal of Research (Humanities)*, *1*(2), 67–76. https://pu.edu.pk/images/journal/english/PDF/4. ESP vs EGP Teacher Article after revision 13-12-14.pdf

Ismuwardani, Z., Nuryatin, A., & Doyin, M. (2019). Implementation of project based learning model to increased creativity and self-reliance of students on poetry writing skills. *Journal of Primary Education*, *8*(1), 51-58. https://doi.org/10.15294/JPE.V8I1.25229

Kapur, D. S. (2015). Understanding the characteristics of an adult learner. *Jamia Journal of Education-An International Biannual Publication*, *2*(1), 111–121. https://www.researchgate.net/publication/287488944

Karapetian, A. O. (2020). Creating ESP-based language learning environment to foster critical thinking capabilities in students' papers. *European Journal of Educational Research*, *9*(2), 717–728. https://doi.org/10.12973/eu-jer.9.2.717

Kenny, N. (2016). Is there a specific method for teaching ESP?. *The Journal of Teaching English for Specific and Academic Purposes*, *4*(2), 253–260.

Khosiyono, B. H. C. (2018). Topic-based ESP materials for vocational school. *Prominent Journal of English Studies, 1*(1), 4–11. https://doi.org/10.24176/pro.v1i1.2486

Lee, B. (2017). TELL us ESP in a flipped classroom. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(8), 4995–5007. https://doi.org/10.12973/eurasia.2017.00978a

Lin, C. C., Barrett, N. E., & Liu, G. Z. (2020). English outside the academic sphere: A mobile-based context-aware comparison study on collaborative and individual learning. *Journal of Computer Assisted Learning*, *37*(3), 657–671. https://doi.org/10.1111/jcal.12514

Liu, G. Z., Chen, J. Y., & Hwang, G. J. (2017). Mobile-based collaborative learning in the fitness center: A case study on the development of English listening comprehension with a context-aware application. *British Journal of Educational Technology*, *49*(2), 305–320. https://doi.org/10.1111/bjet.12581

Liu, J., Chang, Y., Yang, F., & Sun, Y. (2011). Is what I need what I want? Reconceptualising college students' needs in English courses for general and specific/academic purposes. *Journal of English for Academic Purposes*, *10*(4), 271–280.

Long, T., Logan, J., & Waugh, M. (2016). Students' perceptions of the value of using videos as a pre-class learning experience in the flipped classroom. *TechTrends, 60*(3), 245-252. https://doi.org/10.1007/s11528-016-0045-4

Mahbub, M. A. (2019). English teaching in vocational high school: A need analysis. *JEELS Journal of English Education and Linguistics Studies,* 5(2), 229–258.

Mannahali, M., Rijal, S. & Yusri (2020). Communicative translation method in increasing students' performance in translation class. *Asian ESP Journal*, *16*(4), 259-270.

Master, P. (2005). Research in English for specific purposes. In E. Hinkel, (Ed.), *Handbook of research in second language teaching and learning* (pp. 99-115). London: Lawrence Erlbaum Associates.

Medical Education Research and Development, M. S. U. (n.d.). *What, why, and how to implement a flipped classroom modeL.* Retrieved November 10, 2021, from https://omerad.msu.edu/teaching/teaching-skills-strategies/27-teaching/162-what-why-and-how-to-implement-a-flipped-classroom-model

Menteri Pendidikan dan Kebudayaan Republik Indonesia. (2013). *Peraturan menteri pendidikan pendidikan dan kebudayaan republik indonesia nomor 70 tahun 2013 tentang kerangka dasar dan struktur kurikulum sekolah menengah kejuruan/madrasah aliyah kejuruan.*

Menteri Pendidikan dan Kebudayaan Republik Indonesia. (2018). *Peraturan Menteri Pendidikan dan Kebudayaan RI No. 37 Tahun 2018 tentang Perubahan atas Peraturan Menteri Pendidikan dan Kebudayaan RI No. 24 Tahun 2016 tentang Kompetensi Inti dan Kompetensi Dasar*

Norton, J. (2018). Lesson study in higher education: A collaborative vehicle for professional learning and practice development of teachers of English for specific purposes. In *Key issues in English for specific purposes in higher education* (pp. 95-109). Springer, Cham.

Novitasari, F. N. (2019). Collaborative learning in ESP speaking classroom: Learners' perceptions and experiences. *KnE Social Sciences*, *3*(10), 309. https://doi.org/10.18502/kss.v3i10.3912

Patton, A. (2012). *Work that matters the teacher's guide to project-based learning.* Paul Hamlyn Foundation.

Rhahima, A., Inderawati, R., & Eryansyah, E. (2021). Students' needs analysis for the development of electronic descriptive reading materials for hotel accommodation program in VHS. *Eralingua: Jurnal Pendidikan Bahasa Asing dan Sastra*, *5*(2), 470-482. https://doi.org/10.26858/eralingua.v5i2.20182

Sadeghi, B., Taghi Hassani, M., & Hemmati, M. R. (2013). The effects of genre-based instruction on ESP learners' reading comprehension. *Theory and Practice in Language Studies*, *3*(6), 1009–1020. https://doi.org/10.4304/tpls.3.6.1009-1020

Salem, A. A. M. S. (2018). Engaging ESP university students in flipped classrooms for developing functional writing skills, HOTs, and eliminating writer's block. *English Language Teaching*, *11*(12), 177. https://doi.org/10.5539/elt.v11n12p177

Salleh, F. I. M., Ghazali, J. M., Ismail, W. N. H. W., & Raidzuan, S. N. M. (2018). Problem based learning (PBL) in ESP classroom. *International Journal of Pure and Applied Mathematics*, *118*(24), 1-13.

Salmani-Nodoushan, M. A. (2020). English for specific purposes: Traditions, trends, directions. *Studies in English Language and Education*, *7*(1), 247–268. https://doi.org/10.24815/siele.v7i1.16342

Sezer, B., Sezer, T., & Lampotang, S. (2017). How to flip a classroom in four simple steps. *IACB, ICE & ICTE Proceedings*

Shaalan, I. E. N. A. W. (2020). Integrating project-based learning strategies in the design of an ESP dental vocabulary course for ESL Malaysian majors. *Arab World English Journal*, *11*(3), 464-483.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of business research*, *104*, 333-339.

Taillefer, G. (2007). The professional language needs of economic graduates: Assessment and perception for French context. *English for Specific Purposes*,*26,* 135-155.

Tangpermpoon, T. (2008). Integrated approaches to improve students writing skills for English major students. *ABAC journal*, *28*(2), 1-9.

Trujeque-Moreno, E. E., Romero-Fernández, A., Esparragoza-Barragán, A., & Villa-Jaimes, C. J. (2021). Needs analysis in the English for specific purposes (ESP) approach: The case of the benemérita Universidad Autónoma de Puebla. *Mextesol Journal*, *45*(2), 1–24.

Vogt, K., & Kantelinen, R. (2013). Vocationally oriented language learning revisited. *ELT Journal*, *67*(1), 62–69. https://doi.org/10.1093/elt/ccs049

Wette, R. (2018). English for specific purposes (ESP) and English for Academic purposes (EAP). *The TESOL Encyclopedia of English Language Teaching*, 1–7. https://doi.org/10.1002/9781118784235.eelt0199

Wiranegara, D. A. (2019). Designing project-based learning in ESP class. *Journal of English for Academic and Specific Purposes*, *2*(2), 25-35.

Zuana, M. M. M. (2016). Implementing project-based learning (PBL) learning course in ESP classroom. *Nidhomul Haq: Jurnal Manajemen Pendidikan Islam*, *1*(2), 115-125.

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INTERROGATING THE PURPOSE OF SECONDARY EDUCATION IN ETHIOPIA: RHETORIC AND REALITY

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Abstract
The study examined the prevailing purpose of secondary education. Interview, questionnaire and observation are the tools used to collect data from curriculum experts, secondary school leaders, teachers, students and classrooms. Independent t-test was used to analyze quantitative data. Qualitative data obtained through interview, observation, and document analysis were analyzed using narrative description. Though the results from analysis of the Education Policy and related documents indicated the purpose of secondary education is to prepare students both for the world of work and for further education, key stakeholders perceived preparation for national examinations and higher education as the major intent of secondary education. It was found that experts, educators and students had no adequate understanding about the half part mission of secondary education, preparation for work. It was also found that the curriculum wasn't designed to prepare students for work and teacher centered approach was the dominant pedagogical strategy employed in the schools. As a result, it is concluded that the prevailing purpose of secondary education is to prepare students for examination and higher education. It was suggested to enhance key stakeholders understanding about the entire purpose of secondary education and to revise the curriculum in use and pedagogical practices of the schools.

Keywords: competencies, curriculum, secondary education, work skills, world of work

Introduction
Secondary education provides the optimum setting to prepare young people, predominantly adolescents, for productive adult lives, including participation in social, political, and economic spheres (Jacob & Lehner, 2011). In developed countries, the education that children receive during their teenage years has long been recognized as crucial to development of job skills and other attributes that affect the

ability to function productively as a member of society (Eubanks & Eubanks, 2009). Gradually attempts were made to change and improve the role of secondary education in Africa in line with the progress of development of the countries. Previously, in most African countries, the role of secondary education is mainly to enable students acquire the knowledge and skills that are important to prepare them for the future education (Bregman & Bryner, 2003). Recently, it is perceived as the level at which students develop knowledge, attitude and skills for work and higher education, and it serves as a bridge for school to the world of work. Ndala (2006) also noted that the goal of secondary education of some African countries was changed and aimed to produce graduates who stand on their own feet after completing secondary education. According to UNISCO (2005), secondary education provides effective preparation for those proceeding to academic or professional tertiary education as well as for those entering the world of work either as trainees, wages employees or as self-employed entrepreneurs.

From a holistic point of view, secondary school should equip young people with the tools they need to become resourceful and active members of their communities. This demand schools and school systems to do more than just focus on preparing students for academic tests and improving their test scores. Therefore, the purpose of secondary education shouldn't only to prepare students for examinations, but also to equip them with the skills that are essential in the world of work. However, there is a widely accepted opinion that students' success and schools' effectiveness is determined based on the result of assessment and national examination results that involve passing or not certain tests, subjects. For most countries and people, including political authorities, parents and educational administrators, relevance of education and the status of school is defined in terms of students' examination results. For instance, OECD countries have been using PISA (Programme for International Student Assessment) results as a tool to measure students' performance in key subject areas (reading, mathematics and science) (Lamas, 2015), and as a benchmark to improve their education policy (Schleicher, 2007). However, Llorente (2013) argued that it is a falsehood that the PISA report evaluates competencies (cited in Lamas, 2015). The only chance students have to do is to choose between the given options. In other words, the assessment is objective tests type, which can often be guessed by chance. Besides, the reality is that PISA examines certain aspects of the three subjects based on a competency-based model which is no longer minimized to the three subjects. Lamas (2015) suggested, what is really useful and important is to analyze the contexts and difficulties we encounter, define the educational goals we want to achieve, and create mechanisms of action that will allow us to achieve the intended goals.

No one can consider effectiveness of education system by ignoring relevance of what the system provides the school. What is taught, and how it is taught must be relevant, i.e. learning activities and environments must give learners the best possible opportunities for success and provide an appropriate curriculum and flexible delivery arrangements to meet their diverse destinations (Colby, 2000). Marriott & Goyder (2009) believe that education must be relevant to the present and future interest and

destinations of students. However, most Africa countries including Ethiopia gave more emphasized to expansion of secondary education without giving attention to the relevance of education. Failure to turn out students with relevant knowledge and skills has been the major problem of secondary schools in Ethiopia (Joshi & Verspoor, 2013), and in Africa at large (UNESCO, 2005). Tedesco, Opertti, & Amadio (2013) also argued that, if education is irrelevant, curriculum contents and the teaching and learning process are increasingly perceived as outdated with regards to the knowledge, skills, attitudes and values (the competences) needed to live in an ever-changing world and a century that is filled with uncertainties.

Relevant secondary education facilitates the acquisition of knowledge and development of skills and attitudes that have intrinsic value to address learning goals and the demands of the world of work. Hence, the role of education should not be only to fill up students' mind with theoretical knowledge that prepares students for examination but also the work skills that are essential in the world of work. In line with this, Colby (2000) suggested that education system should provide schools with a curriculum which enables every child to acquire the core academic curriculum and basic cognitive skills, together with essential life skills that equip them to face life challenges, make well-balanced decisions and good social relationships. Opertti (2017) also suggested that checking learning objects in light of the balance between the needs or interests of pupils and the principle of the development of personality, and between theoretical elements and those that are immediately applicable/ practical, or between conceptual aspects and exercises should be among the strategies to secure relevance of education.

Interactive teaching methods promote students' self learning rather than rote memorization. Also, they are vital to make pedagogical practices of schools more effective to equip learners with cognitive, interpersonal, interpersonal and social skills. Based on the result from the rigorous literature review conducted on pedagogy, curriculum, teaching practices and teacher education in developing countries Westbrook et al. (2013) argued that student-centered learning pedagogic approaches increase students' positive outcome. Laura (2013) also suggested that it is crucial to employ learning practices that can equip students with the core work skills which emphasis more on learning by doing and working in teams and thinking creatively and to use authentic assessment methods. To help students gain the competencies and the skills that will enable them develop the capacities to work, students must be given the opportunity to participate in learning activities (Johan, et al., 2012). This demand schools a productive teacher, the one with a solid knowledge of the subjects and has the ability to employ interactive pedagogy and provide students with helpful feedback.

Secondary education plays an important role in preparing labor market entrants as a workforce and providing skills to be upgraded throughout the working career (Karoly & Panis, 2004). Manufacturing industry, agriculture, construction, business sectors, services and public sectors are among the labour markets inviting secondary school graduates around the world (Seetha, 2014; International Labour Organization, 2016). In Ethiopia, organizations that have been absorbing secondary school graduate

as employee are industries, public sectors, private and non-public organizations (Education Development Centre, 2018). The three main sectors in the formal Ethiopian economy that offer the most opportunity for employment for youth are construction, manufacturing, and the services sector (Education Development Centre, 2018). The research conducted by Berhe & Tsegay (2018) revealed that services, industry and agricultural sectors contributed 68.5%, 23.6% and 7.9% of the total employment, respectively. Apparel/textiles, leather, agribusiness, metal products and wood products are the top five manufacturing industries in Ethiopia, and in 2006 and 2014, the share of secondary school graduates' employment in industry was 29.1% and 25.5%.

Historically, hard skills or technical skills are perceived as the only skills necessary for career employment (Robles, 2012). However, today's labor market requires workforce not only equipped with technical skills and attributes but also laborers who possess adequate generic competencies, not occupation-specific practical capabilities and skills that are relevant to the workplace (Susan, 2019). These skills are a combination of competencies and skills that are necessary for individuals to be successful in work environments (Ball, Joyce & Butcher, 2016). The skills are not specifically related to a particular job, task, academic discipline or area of knowledge and that can be used in a wide variety of situations and work settings (Wood, 2012). Whittemore (2018) also believes that the skills are transferable across domains, geographies, work and life contexts, and cross-functional and cross-curricular in education. Thompson (2017) categorized these skills to cognitive and non cognitive domains (cited in Wood, 2012). Cognitive skills are critical thinking, problem solving, collaboration, communication, and learning to learn that can be demonstrated within core academic content areas that are important to success in education, work, and other areas of adult responsibility. Non cognitive skills are personal qualities, attitudes, behaviors, competencies, and skills that enable people to perform well, effectively work well with others, and achieve the identified goals.

The challenge of secondary education in Africa is three-fold (UNISCO, 2005). First, there is a real need for the expansion of secondary education. Second, there is a quality imperative to ensure that secondary school graduates are competitive on the labour market and can make a real contribution to Africa's economies. Third, the education provided must be relevant and meet the peculiar needs of a wider variety of learners and responding to the changing nature of knowledge and the world of work. In addition, the challenge of secondary education is mainly related to the existing narrow conception of the goals of secondary education. That is, preparation for tertiary education has been accorded undue reference over the other equally important goals; personality development and preparation for the world of work.

A number of studies conducted on secondary education (Holsinger & Cowell, 2000; Jidamva, 2012; Rolleston and Frost, 2013; Stevenson, 1995 cited in UNESCO, 2005) revealed that, in most developing countries, there was a considerable gap between what is learned and the real life context and students' present and future world. It was also found that, general secondary education in some less developed

countries wasn't understood as the best preparation area to enter into labour market. Though efforts had been made to relevance of secondary education, local studies (Amare et al, 2016; Joshi & Verspoor, 2013; Solomon & Aschale, 2019) realized that lack of relevance was among the bottleneck problems observed in the education system. However, the local studies didn't' try to assess how curriculum makers and users perceive secondary education and curricular responses to the intended purpose of secondary education. More specifically, the study was intended to:

- Examine subject curriculum experts', school leaders', teachers' and students' understanding about the purpose of secondary education vis-a- vis the official proclaimed purpose
- Assess the space accorded both preparation for higher education and the world of work in the secondary school curriculum.
- Appraise the curricular and pedagogical practices against the prevailing understanding of the purpose of secondary education.

Method

Mixed research method was employed to study the prevailing purpose of secondary school curriculum and instruction. The approach was employed with the assumption that it involves collecting, analyzing, and integrating quantitative and qualitative data in a single study (Onwuegbuzie & Johnson, 2006). One of the purposes of this form of research is that both qualitative and quantitative approaches, in combination, provide a better understanding of a research problem or issue than either research approach alone.

Case study is often associated with a qualitative research design. However, Yin (2003) argues that case studies can be used with both qualitative and quantitative data. Descriptive case study was selected with the assumption that it allows the use of a wide range of data collection methods to collect data from the selected areas (Tharenou, Donohue & Cooper, 2007).

The target population of the study was subject curriculum experts, secondary school principals, teachers and students. Burayu town was selected among areas where different industries inviting secondary school graduates are available. Nekemte town was preferred among areas where high school graduates have limited employment opportunity using convenient sampling technique. Three schools from each town, Burayu and Nekemte, a total of 6 secondary schools were included in the study using convenient sampling technique. Stratified sampling method was used to select four subject curriculum experts from the two streams, that is, two from each (Chemistry, Biology, Geography & History). All the accessible 141 teachers and proportional number of students from each school, a total of 150 students were selected randomly. Education Policy (1994), curriculum framework for KG-grade 12, and Education Sector Development Program III (EDSP III) are the documents selected purposely.

Interview, questionnaire, observation and document analysis are the tools used to collect data from the different sources. Questionnaire allows researchers to secure

data from many people and selected for its natural characteristics that let informants express their ideas and opinions freely. Both open-ended and close ended items included in the questionnaire were used to gather data from teachers and students on the purpose of secondary education, relevance of curriculum and effectiveness of pedagogical practices employed in school. The close-ended questions were prepared in five level Likert-type scales ranging either from strongly agree to strongly disagree (strongly agree, agree, undecided, disagree, and strongly disagree) and never to always (never, rarely, sometimes, often and always).

Semi structured interview guides were used to conduct interviews with subject curriculum experts and school leaders were to learn their understanding about the purpose of secondary education, curricular responses to the world of work and pedagogical practices of the schools. Classroom observations were made to triangulate the data obtained through questionnaire from teachers, school leaders, and students and to make valid conclusions. Twelve classrooms were observed while teachers were teaching in different classrooms and the data were recorded using field notes and video recorder. Document analysis was employed to review the mentioned policy documents.

The data collected were organized and analyzed under different themes that are created based on the specific research objectives. Both quantitative and qualitative methods were used to analyze the collected data. Quantitative data gathered through questionnaire were analyzed using SPSS-24 and independent t-test was employed to see the current status of secondary school curriculum as well as pedagogical practices of the school as perceived by teachers and students. This test is also used to see the variations of two mean scores of the two groups. The qualitative data collected through document analysis, observation, interview and open-ended questions were presented and analyzed qualitatively using narrative description.

Results

As discussion in the Education Policy, curriculum framework and ESDP-III documents, the goal of secondary education is to prepare students for further education and for the world of work (TGE, 1994; MoE, 2005; MoE, 2009). Providing students with the knowledge, skills, abilities and attitudes that enable them to make all rounded participation is among the aims of education listed in the policy document (TGE, 1994). Preparing students for work and encouraging them to develop positive work habits and high regard for work is also the major target of education in Ethiopia. From these findings, it is being learned that majority of the skills the labour market require from high school graduates are presented in the different policy documents as aim or objective of education. Base-line skills, life skills, higher-order skills, independence, adapting to change and time management are identified as key competencies and skills students need to learn and work (MoE, 2009). Satisfying the need for trained middle level human power and the demands of tertiary level of education is also among the major concern of ESDP III (MoE, 2005). Based on these results, it is concluded that the intended purpose of secondary education is to equip

students with competencies and skills that are essential to prepare them for higher education and for the world of work.

Table 1. The Skills Addressed in the Policy Documents

Documents	Critical thinking	Problem solving	Communication	Creativity	Collaboration& teamwork	Decision making	Self regulation	Use of technology	Technical skills
Education policy (1994)									
i. Aims		√				√			√
ii. Objectives	√	√	√		√			√	√
B. Curriculum framework									
i. Vision	√	√			√		√		√
ii. Values	√	√			√	√			
iii. Principles	√	√		√					√
iv. Key competencies	√	√	√		√	√	√	√	√

Purpose of Secondary Education: Educators' Perspectives

As mentioned repeatedly, secondary education prepares students for different destinations; the next level of education and preparation for work. However, curriculum experts clearly stated that secondary education is mainly to prepare students for national examination and higher education. For instance, one of the interviewees reported as follows:

The main purpose of secondary education is to prepare students for examination that let them to enter university. It is also to bring holistic development to learners. The target of 'my subject' area is to equip students with theoretical knowledge and practical skills that are essential to help students effective in life and education (Gurmu, social science expert 2).

The other social science curriculum expert also replied that secondary education is planned to develop positive attitude and global (broader) perspective and the skills help students to be effective in their individual life and to live with others (Bosona, Social science expert 1). Natural science curriculum experts didn't answer preparation for work as the major purposes of secondary education. One among the natural sciences experts also explained secondary education as:

The goal of secondary education is mainly to prepare students for higher education. Moreover, the aim of secondary education is to produce citizens who competent at national and international level. The demand of the government including moral issues is also considered as part of the goal of secondary education (Jiksa, natural science expert 2).

It was revealed that school leaders understanding about the purpose of secondary education is similar to curriculum experts' views. One among the school principals said:

The major goal of secondary education is to prepare students for national examination and university. Hence, our responsibility is to make the teaching learning processes and school environment conducive for students' maximum learning and succeed in entrance examination (Qabso, school leader1).

On the same issue, another school leader responded as follows:

The target of our school plan and its implementation is to improve students' academic achievement including teacher made evaluations and national examination. Teachers are required to meet the agreed-on benchmarks and evaluated based on their performance that are directly or indirectly referred to student's result (Guma, school leader 2).

Teachers also believed that the role of secondary school is to provide students the subject matter knowledge which is essential to be successful in examinations and to get prepared for higher education. Few of them mentioned university, technical and vocational college and teacher training college as examples for which secondary education prepares students. Data from all students also confirmed that secondary education is to provide theoretical knowledge and attitudes that are crucial to prepare them for further learning. In response to the question asked to identify their destinations after secondary school, all informants responded as they have planned to be university student. Few (9.32%) of those who decided to go to university were also interested to create their own job or employed in nonpublic or public organizations.

For the question asked to identify if the skills demand of employers is considered during curriculum making, one among natural sciences experts reported that:

Curriculum is changed based on the need of the government to improve or to update or totally change the curriculum in use. Evaluation of the curriculum in use and assessment of the international best practices were among the major tasks in curriculum development process. However, we don't clearly define the specific employers of secondary school graduates. Consequently, I'm not confident to assure you that the skills and knowledge demand of employers are included in the textbook (Jiksa, natural science expert 2).

Regarding the nature of stakeholder's participation, the study identified that curriculum experts, international organizations, consultants (advisors), teachers, public sectors representatives, and Teachers' Association were directly or indirectly involved in the process curriculum making (Bosona, Social science expert 1). However, another expert expressed his worry as follows:

Though secondary school curriculum framework was designed by group of experts, competition for textbook preparation was open for any international and local organization that has got credibility from government/MoE. The selected

organization in turns invites local and international textbooks writers that have no any/little understanding about educational context of the country and knowledge and skills required to develop relevant curriculum (Obsa, natural science expert 1).

Similarly, another expert who took part in preparation of curriculum framework and serving as textbook evaluator expressed his observation as follows:

One of the factors that have been affecting the achievement of the intended purpose is competence of textbook writers. In my observations, I'm not convinced with the knowledge and skill of some of the textbook writers. Some of the drafts I evaluated don't satisfy the minimum requirement to be a textbook (Jiksa, natural science expert 2).

Relevance of Curriculum to the Purpose of Secondary Education

This section presents the extent to which curriculum elements, including learning objectives, review activities and exercises are aligned with the intended purpose of secondary education.

Table 2. Teacher Response on Relevance of Secondary School Curriculum

No	Secondary school curriculum	Mean	SD	t	P
1	prepares students for work	2.61	1.14	3.70	.001
2	serves students who have planned to go to higher education and world of work equally.	2.55	1.37	1.39	.172
3	encourages students to develop cognitive work skills	3.10	1 .18	1.97	.051
4	The curriculum provides students with interpersonal skills that are essential to be effective workforce	3.02	1.14	.182	.856
5	enables students develop intrapersonal skills	2.72	1.17	2.34	.021
6	Both theoretical knowledge and practical skills are equally emphasized in the curriculum	2.61	1.20	.507	.613
7	The curriculum encourages students to develop work habits and attitudes that are essential for work	2.69	0.97	1.95	.053

Expected mean =3.00, it is the middle score in a five-Point Likert Type Scale, P< 0.05

As can be seen from the Table 2, teachers labeled the status of secondary school curriculum to promote cognitive skills and interpersonal skills employers expect from high school graduates as medium (3.10; 3.01). On the other hand, it was below the average mean for intrapersonal skills (2.72). The result of the study revealed that the integration of work habit and positive attitude towards work (2.69) and practical skills (2.61) in secondary school curriculum was not to the expected level. It was also learned that the curriculum doesn't serve equally students who have planned to go to higher education and the world of work (mean=2.55). Relevance of the curriculum to prepare students for work was below the expected mean (2.61). Based on these findings, it is concluded that secondary school curriculum better serve students interested to go to the next level of education.

Pedagogical Practices of the Schools

The three domains of competencies and the core work skills, including critical thinking, creative thinking, decision making, and problem-solving skills, communication skills, leadership skills, teamwork, ability to learn, work independently and time management are used to assess effectiveness of pedagogical practices of the schools to prepare students for work. The following four tables present how often teachers implemented instructional activities that are expected to encourage students to develop the core work skills.

Table 3. Implementation of Instructional Activities Intended to Teach Cognitive Skills

No	How often teachers:	Mean (T)	Mean(S)	Agg.	t	P
1	ask students to do learning activities that demand them to analyze, synthesize and evaluate data	2.90	2.61	2.75	3.30	.001
2	encourage students to solve problems	3.32	3.10	3.21	1.06	.342
3	provide activities that demand students to generate ideas and test out ideas	2.95	2.61	2.78	4.66	.001
4	ask students to make decisions and explain the rationale behind their decisions	2.90	2.58	2.74	3.23	.003
5	encourage students to draw their own conclusions	2.78	2.56	2.67	3.43	.011

Expected mean =3.00, it is the middle score in a Five-Point Likert Type Scale, P< 0.05

The study found that the mean score for items representing instructional activities employed to promote higher order cognitive skills was below the average. That is, the mean scores for critical thinking skills, creativity, and decision-making skills were 2.75, 2.78 and 2.70, respectively. However, implementation of activities employed to encourage problem-solving skills was slightly above average (3.21). Except for problem solving skills (t=1.06, P>.05), the independent t-test result indicated that the mean difference between teachers and students is statistically significant for all the skills (P<0.05). However, both groups agreed that pedagogical practices of the schools did not encourage students to develop the cognitive work skills to the expected level.

Table 4. Instructional Activities that are identified to Teach Interpersonal Skills

No	How often teachers:	Mean (T)	Mean(S)	Agg	t	p
1	arrange group discussion/work during instruction	3.32	3.07	3.18	1.18	.252
2	give students different responsibilities (leader, time keeper, presenter) during group discussion	2.91	2.74	2.82	2.18	031
3	encourage students to prepare and deliver oral presentation/reflection in the classroom	2.89	2.52	2.70	3.31	001
4	arrange debate at school / classroom level	2.53	2.07	2.27	2.07	.040

Expected mean =3.00, P< 0.05

The study revealed that the extent to which teachers arranged small group discussions during instruction was average (3.18). However, the instructional activities employed in the schools didn't encourage students to develop the ability to prepare and deliver oral presentations and debate and to prepare them for different responsibilities during group discussions were below the expected level (2.70, 2.27, 2.82). The independent test indicated that there is statistically significant different between the mean score for the two groups ($p < 0.05$), excluding the mean scores for item 1 (t=1.18, P>.05). Based on these results, it is concluded that pedagogical strategies delivered in the schools did not support students to develop interpersonal skills.

Table 5. Implementation of identified Instructional Activities to Teach Intrapersonal Skills

No	How often teachers:	Mean (T)	Mean (S)	Agg.	t	P
1	give students activities to be done individually	3.10	2.75	2.92	6.51	.001
2	give students chance to supervise & provide feedback to other students' work	2.87	2.25	2.53	3.02	.003
3	give students tasks to be completed within the given time using the prescribed criteria	3.36	3.23	3.29	.63	.538
4	encourage students to be aware of and obey classroom and school rules & norms	2.95	2.62	2.79	4.05	.001

Expected mean =3.00, P< 0.05

The mean score for items representing pedagogical activities supposed to support students to develop the skills to evaluate others work and give feedback and self control skills was below the expected mean value. On the other hand, it was found that the status of pedagogical practices of the schools to encourage students to complete tasks independently and within the given time were medium. Except for time management (t=.63, P>.05), the result for independent t-test showed that the mean difference for teachers and students is statistically significant ($P < 0.05$). However, both groups agreed that instructional practices of the schools didn't allow students to develop intrapersonal skills the work environments require from employees.

Table 6. Instructional Activities Intended to Teach Independent Learning and Practical Skills

No	How often teachers:	Mean (T)	Mean(S)	Agg	t	p
1	employ the different interactive instructional strategies in teaching the lesson	3.28	2.92	3.07	1.68	96
2	use majority of the instructional time to lecture a lesson	3.67	3.42	3.55	3.10	.003
3	invite students to do project work or conduct laboratory experiment when needed	2.21	1.64	1.92	4.55	.001

4	order students to write & submit laboratory / project work reports	2.26	1.79	2.00	1.82	.071
5	arrange study trip to help students visit different industries or historical areas	1.97	1.50	1.71	2.21	.027

Expected mean =3.00, P< 0.05

In order to encourage students to develop transversal competencies and the work skills, teachers are expected to integrate the skills into classroom instructions and required to change their role from being transmitters of knowledge to facilitators of students learning. However, as can be seen from Table 6, the study depicted that teachers occasionally employed active learning strategies in teaching the lessons (3.07). It was also identified that majority of the instructional time was used to lecture the classes (3.55). Similarly, the extent to which teachers invited students do experiments and/or project works, report laboratory and project results and arranged study trip so that students get first-hand experience was very low (1.92, 2.00, 1.71). From these results, one can conclude that the instructional activities employed in the schools did not encourage students to do tasks independently and develop technical skills that are essential to be effective in the world of work.

Discussion
As said earlier, secondary education offers learners the opportunity to develop attitudes and skills enable them develop job-oriented skills, and continue learning. However, the study revealed that that subject curriculum experts, school leaders, teachers and students believed preparation for national examination (and/or for higher education) as the only major purpose of secondary education. None of them mentioned preparation for the world of work as the major purpose of secondary education. In consistence with this finding, the research conducted by Sifuna & Sawamura (2010) indicated that the results of national examinations were used to assess efficiency of the secondary schools. Based on the results of the study, it is possible to conclude that curriculum experts, school leaders and teachers didn't consider preparation for work while they were designing curriculum and delivering instruction. Similarly, students weren't conscious about their destinations after secondary school other than higher education institutions.

In order for participatory processes to be truly effective, all stakeholders must participate effectively in curricula development, implementation, and evaluation process (Lindeberg, 2009). In contrast, the study indentified that curriculum development team at Ministry of Education and local and/ or international organizations were the only active actors in the process of textbooks preparation. It was found that potential employers of secondary school graduates were not clearly identified. The study further revealed that involvement of employers of the graduates in the process of curriculum development was not confirmed. As a result, it is possible to infer that secondary schools are using curriculum that does not adequately reflect the skills needed in the world of work. This doesn't mean that the others were totally ignored. Few representatives of public sectors and professional associations

were participated during validation of the curriculum. Besides, the procedure and criteria used to prepare the curriculum do not support realization of the purpose intended to prepare students for the world of work.

Secondary school curriculum needs to strike a balance to meet the needs of young people who will enter the labour force directly from secondary education and those who are interested to proceed to post-secondary education. However, the result indicated that secondary education was not providing equal serves for students who have planned to different destinations; higher education and world of work. That is, the space provided for the different destinations students will join after secondary education was not equal, and it seems the priority was given to preparation for examination and higher education. Similarly, the study conducted by Akyeampong (2014) indicated that secondary education systems in most African countries place a strong emphasis on knowledge and competencies for higher academic education, even though most school-leavers do not enter tertiary education. It was also disclosed that the curriculum didn't provide considerable space to practical skills and work habits and attitudes that are essential to prepare students for work.

The instruction which is derived from a mix of constructivist approaches promotes participatory, more interactive, discover-oriented pedagogy and cooperative learning (Sayre, 2013). In relation to this, it was found that interactive instructional strategies were not demonstrated to the level required to encourage students develop the required work skills. Teachers used most of the instructional time to present the lessons and students were passively attending teachers' lecture throughout most of the lessons. Sifuna & Sawamura (2010) also identified that the main teaching strategy that characterizes secondary school teaching is the large amount of teachers' talk, which involves mainly the teacher presenting to the students, intersperse with questions asked to the whole class, with predetermined answers. Teacher centered approach that don't encourage students to develop the skills that prepare them for work, including the ability to independently complete tasks, solve problems and work with others with minimum support was the instructional method frequently employed in the schools.

When students work cooperatively together, they learn to give and receive help, share ideas and listen to other students' perspectives, and seek new ways of clarifying differences and resolving problems (Gillies, 2016). However, the findings of the study showed that there was no strong evidence that proofs the pedagogical activities delivered in the classrooms strengthen students' active participation. Consistent with this finding, it was identified that the teaching practices in Eastern European countries was largely traditional and centered around the teacher (e.g., delivering a lecture to the whole class) (OECD, 2021). Besides, the classrooms and instructional activities weren't organized in ways it allows students to develop the skills help them to work together with others and actively engaged in learning activities. The result has also indicated that cooperative learning strategy which encourages students to develop critical thinking skills, teamwork and cooperation, time management, self control, and leadership skills wasn't implemented to the level it prepares students for the world of work.

When students work collaboratively, there is an expectation that each student contributes equally and assigned specific roles within their group. The primary reason for assigning role is to ensure that no group member dominates the group, or contributes nothing (Yager, 1991 cited in Kim, 2005). Conversely, the result of the study revealed that students were rarely assigned to different responsibilities during discussions in small groups. Collaborative interactions include taking on leadership roles, making decisions, building trust, communicating, reflecting, and managing group (Carpenter & Pease, 2013). In the classroom where cooperative learning was evident, one or two students in each group were trying to deal with the provided learning tasks and share their understandings to the group members and to the whole class. Besides, teachers weren't arranged different stages at classroom or school level so that students develop the work skills including analytical skills, oral-communication, social-interaction, ability to synthesize the arguments, speak impromptu, and make informed decisions and judgments that are expected to be achieved through debate and oral presentations. It implies that the instructional approaches used in majority of the classrooms didn't invite students to get prepared for different life and work responsibilities.

The results of the study indicated that the intention to promote the skills to solve problem was encouraging. However, it was learned from the classroom instructions that the intention of the problems students required to solve don't require higher order cognitive skills. Instead of providing further guiding questions that foster critical thinking skills and push students to give answer by themselves, most teachers tried to give answers to students' questions. Instead of devising alternative techniques to search for solutions and cooperate with others to find answer through discussion, most of the students wait for teachers to provide answers. Similarly, the study conducted by Kurniawati, Zubaidah, & Mahanal (2015) found that critical thinking skills of public senior high school students are still not well developed and even need to be improved. It was also disclosed that students were not provided with tasks that demand them to analyze, synthesize and evaluate information and help them to get opportunity to develop critical thinking skills and problem-solving skills that are required in the world of work. Unless teachers encourage students and provide them activities that force them to deal with problems that demand cognitive process, they wouldn't develop the skills help them to look for alternative solutions for a problem (Greenstein, 2012; Mayer, 2013). Conversely, the actual classroom practices didn't encourage students to develop the skills that employees need to solve problems they will face in the work environments.

Critical thinking skills, well-developed problem-solving skills, ability to identify the problem and seek different alternative solutions are the key prerequisite for decision-making skills. Though students were asked to select from alternatives in different forms (to make decision), the results revealed that the instructional activities employed in the classrooms were rarely invite students to make decisions that require critical thinking skills, problems solving skills and justification for their choices. Alismail, & McGuire (2015) suggested problem-based learning strategy to develop the ability to identify, analyze and define problems, to know and apply strategies for

dealing with unfamiliar problems, to generate, analyze and select problem-solving strategies and to make justifiable decisions. However, the instructional activities employed in the schools didn't invite students to generate ideas, test out ideas and invent a solution to a problem. From these findings, it is concluded that the school pedagogical practices didn't support students to develop the higher order cognitive work skills that are essential to get prepared for the world of work.

Instructional activities that are responsive to the world of work require teachers to encourage students to develop the ability to learn independently throughout their life, the ability to solve problems independently, acquire the core academic knowledge, and facilitate the development of higher-order thinking skills. Though the study confirmed that teachers were tried to encourage students to complete tasks individually, the tasks focused on theoretical concepts that don't require students to use inquiry skills and the skills that are vital in the world of work. Similarly, pervious study conducted by Tate and Swords (2013) demonstrated that high school learning focused on memorizing and understanding concepts. As a result, many first-year students in the United Kingdom experience 'a skills gap' in the transition to university. It is also identified that for most teachers independent learning is merely students working alone. The important roles teachers play in supporting and enabling students' independent learning was not considered. This might be due to misconceptions with the teachers understanding about the concept of independent learning.

Inquiry-based practical work require students to think of problems, formulate hypotheses, observations and draw conclusions from scientific phenomena and requires purposeful observations or scientific inquires by manipulating equipment and materials (Hofstein, 2017; Lederman & Lederman, 2012). There are considerable number of projects works and experiments in high school science textbooks. However, observations revealed that neither of them was implemented in the schools due to different reasons. Lack laboratory room, chemicals, apparatuses and laboratory technician were among the factors hindered implementation of experiments listed in the textbooks. In consistent with this result, Boyuk et al. (2010) identified that lack of materials needed for the required laboratory work is vital for experiment and insufficient information for carrying out the experiment are problems teachers encountered to conduct laboratory work. In the absence of real engagement in project work and laboratory experiment, it is unusual to expect written or oral report from students. As a result, it is concluded that the schools weren't encouraging students to develop critical thinking skills, problem solving, working with others, practical skills and the ability to prepare and deliver oral and written reports expected to be acquired through project work and experiments.

Selective observation which is supported with experts' explanation encourages students to develop work habit, positive attitude towards work, connect theory to practice, and ability to analyze, synthesize and summarize information and reflect on their observation. There are industries and historical areas that are conducive for students to gain direct experience. However, the result of the study showed that the opportunity to acquire the work skills and work habits and attitudes that are required

in the world of work and expected to be achieved through study trip was totally denied. Students weren't given chance to visit any relevant location (industry or historical places). This finding is directly in line with previous study's findings conducted by Behrendt & Franklin (2014) which stated that field trips have become less common due to limited funding and limited available time.

Hard-working, the ability to complete tasks in time and consistency are the characteristics of people with well-developed self-discipline. People with low self-discipline create behavioral problems that disrupt the learning and working environment and limit the individual performance. Unlike the efforts made to help students develop time management skill, the study found that the instructional activities delivered to help students learn and develop self-control skills were not encouraging. Moreover, the instructional strategies employed in the classrooms didn't allow them to be more responsible for their actions, encourage a reflexive approach to learning, involves learners in judging their performance or that of their peers, and also the developing and using of evaluative expertise, and providing, seeking and utilizing feedback. To sum up, the instructional activities employed in the classrooms weren't sufficient to equip students with the skills secondary school graduates required to become effective in the world of work. As a result, it is concluded that the major intention of the pedagogical practices observed in the schools wasn't to prepare students for work.

Conclusion

As mentioned in the policy documents, preparing students for higher education and for the world of work are the equally important goals of secondary education. However, the current study showed that subject curriculum experts, school leaders, teachers and students perceived preparation for national examination and higher education as the major goal of secondary education. They associated students' success and schools' effectiveness with students' national examinations result that determines the success to join higher education institutions. They weren't conscious about the other half part mission of secondary education; preparation for the world of work. It was also realized that teachers, school leaders and students weren't aware of the different destinations students will join after secondary education other than the next level of education. Though experts mentioned some of the skills required in the world of work as they are essential for students' future career, they had no clear idea about importance of the skills to the world of work. Consequently, it is concluded that key stakeholders had no clear understanding about the entire purpose of secondary education.

Regarding the emphasis given to preparation for work and higher education in secondary school curriculum, it was confirmed that the curriculum was mainly intended to equip students with the knowledge that help students to be successful in national examination and to join university. Similarly, the room provided for theoretical knowledge and practical skills and the behaviors and skills that are essential in the world of work is not balanced; it is theory-oriented curriculum. It was also found that teacher centered instructional strategies that have no significant role to

encourage students to develop the work skills was the dominant approach employed in the schools. Most of the instructional time was used to lecture the class and the teachers dominated the instructional activities. In addition, the instructional activities employed in the schools didn't encourage students to develop the skills and attitudes that are essential to prepare them for the world of work. Hence, it is possible to infer that secondary school curriculum and pedagogical practices of the schools were less relevant to prepare students for work.

The study revealed that the criteria and procedure used to prepare the textbooks didn't consider the local context and the knowledge and skills that are essential to prepare students for work. It was also confirmed that potential employers of secondary education graduates aren't clearly defined. Besides, it wasn't confirmed to conclude that employers were participated in the curriculum development process and their demands are adequately integrated in the curriculum. Hence, it is concluded that the effort made to connect secondary school curriculum and instructional activities to the world of work didn't bring noticeable effect.

In order to prepare responsive curriculum, subject curriculum experts and textbook writers are recommended to be aware of the entire purposes of secondary education and to design curriculum that could serve demands of the internal and external users of the output of secondary education. Identifying the potential employers and addressing their demand is among the suggestions that are essential to enable curriculum experts and textbook writers to design curriculum that prepare students for work. They are also recommended to have not only clear understanding about the goal of education and subject matter knowledge but also adequate knowledge and skills that are required to prepare curriculum that are responsive to the entire purpose of secondary education. Similarly, school leaders, teachers and students are advised to have adequate understanding about the whole purpose of secondary education and the alternative destinations of students after secondary education/school, and the schools are recommended familiarized with the work skills students need for work and to deliver instructions that could prepare students for the world of work.

References

Akyeampong, K. (2014). Reconceptualised life skills in secondary education in the African context: Lessons learnt from reforms in Ghana. *International Review of Education, 60*(2), 217-234.

Alismail, H. A., & McGuire, P. (2015). 21st Century standards and curriculum: Current research and practice. *Journal of Education and Practice, 6*(6), 150-154.

Amare, et al. (2016). *Ethiopian education roadmap 2017-2030: Desk review of secondary and preparatory education.* Education Strategy Center: Ministry of Education.

Ball, A., Joyce, H., & Butcher, D. A. (2016). Exploring 21st century skills and learning environments for middle school youth. *International Journal of School Social Work*, *1*(1), 1-15.

Behrendt, M., & Franklin T. (2014). A review of research on school field trips and their value in education. *International Journal of Environmental and Science Education*, *9*(3), 235-245.

Berhe, M., & Tsegay, G. (2018). *The state, determinants, and consequences of skill mismatch in the Ethiopian labour market, working papers 021.* Ethiopian Development Research Institute.

Boyuk, U., Demir, S., & Erol, M. (2010). Analyzing the proficiency views of science and technology teachers on laboratory studies in terms of different variables. *TUBAV Bilim Dergisi, 3*(4), 342-349.

Bregman, J., & Bryner, K. (2003). *Quality of secondary education in Africa*. Paper presented at the ADEA biennial meetings in Mauritius, SEIA: World Bank.

Carpenter, J. P., & Pease, J. S. (2013). Preparing students to take responsibility for learning: The role of non-curricular learning strategies. *Journal of Curriculum and Instruction, 7*(2), 38- 55.

Colby, J. (2000). *Learning outcomes in international context.* Paper presented at the Annual Meeting of the Comparative and International Education Society, San Antonio, Texas.

Education Development Center (EDC). (2018). *Labor market assessment report.* Retrieved on November 17, 2021, from: http/www.careevaluations.org

Eubanks, D., & Eubanks, L.T. (2009). The importance of secondary education. In Tarasova, N. P. (ed.). *Quality of Human Resources: Education - Volume II.* United Kingdom: EOLSS Publications.

Gillies, R. M. (2016). Cooperative learning: Review of research and practice. *Australian Journal of Teacher Education, 41*(3), 39-54.

Hofstein, A. (2017). The role of laboratory in science teaching and learning. In: K.S. Taber & B. Akpan, (Eds.), *Science Education* (pp. 357-368). Rotterdam: Sense Publishers.

Holsinger, D. B., & Cowell, D. B. (2000). *Positioning secondary school education in developing countries*. Paris: UNISCO.

Jacob, J., & Lehner, S. (2011). Secondary education: A guide to education project design based on a comprehensive literature and project review. *The EQUIP2 State-of-the-Art Knowledge Series*. USAID.

Jidamva, G. (2012). *Understanding and improving the quality of secondary school education*. Tanzania: Abo AKademy University.

Joshi, R. D., & Verspoor, A. (2013). *Secondary education in Ethiopia: Supporting growth and transformation.* Washington DC: World Bank.

Karoly, L. A. & Panis, C. W. A. (2004). *The 21st century at work: Forces shaping the future workforce and workplace in the United States*, MG-164. California: The RAND Corporation

Kim, J. S. (2005). The effects of a constructivist teaching approach on student academic achievement, self-concept, and learning strategies. *Asia Pacific Education Review, 6*(1), 7- 19.

Kurniawati, Z., Zubaidah, S., & Mahanal, S. (2015). Remap CS (reading concept map cooperative script) learning model to empower student's critical thinking skills. *Proceeding Biology Education Conference*, *13*(1), 399-403.

Lamas, H. (2015). School performance. *Journal of Educational Psychology, 3*(1), 351-385

Laura, B. (2013). *Enhancing youth employability: What? Why? and How? Guide to core work skills; international labour office, skills and employability department.* Geneva: ILO.

Lederman, N.G., & Lederman, J. S. (2012). Nature of scientific knowledge and scientific inquiry: Building instructional capacity through professional development. In B. Fraser et al. (eds.). *Second International Handbook of Science Education* (pp 335-359). Netherlands: Springer.

Lindeberg, J. (2009). *From inclusive education to inclusive curricula, contribution to UNESCO-IBE E- forum*. Paris: UNISCO.

Marriott, N., & Goyder, H. (2009). *Manual for monitoring and evaluating educational partnerships.* France: UNESCO, International Institute for Educational Planning.

MoE. (2005). *Education sector development program III: Program action plan.* Addis Ababa

MOE. (2009). *Curriculum framework for Ethiopian education (KG- Grade 12).* Addis Ababa: St. George printing press.

Ndala, K. (2006). *Education trends & developments in Sub-Saharan Africa*. Retrieved on December 20, 2019 from: https://www.opensocietyfoundations.org

OECD. (2021). *Education in Eastern Europe and Central Asia: Findings from PISA*. Paris: OECD Publishing.

Onwuegbuzie, A. J., & Johnson, R.B. (2006). The validity issue in mixed research. *Research in the Schools, l*(13), 48-63.

Opertti, R. (2017). *Curriculum in the education 2030 agenda: Latin America and the Caribbean. In-progress reflections on current and critical issues in curriculum, leaning, and assessment, No. 10*. Geneva: IBE-UNESCO.

Rolleston, C., & Frost, M. (2013). *Improving education quality, equality and access.* UK: Young lives.

Schleicher, A. (2007). Can competence assessed by PISA be considered the fundamental school knowledge 15-years old should possess?. *Journal of Education Change*, *8*(3), 49-357.

Seetha, N. (2014). Are soft skills important in the workplace? A preliminary investigation in Malaysia. *International Journal of Academic Research in Business and Social Sciences, 4*(4), 44-56.

Sifuna, D. N., & Sawamura, N. (2010). *Challenges of quality education in Sub-Saharan Africa countries: Some key issues*. Nova: Science Publisher.

Melese, S. & Tadege, A. (2019). The Ethiopian curriculum development and implementation vis-à-vis Schwab's signs of crisis in the field of curriculum. *Cogent Education, 6*(1), 1-16.

Susan, D. (2019). Soft skills needed for the 21st century workforce. *International Journal of Applied Management and Technology, 18*(1), 17-32.

Tedesco, J. C., Opertti, R., & Amadio, M. (2013). *The curriculum debate: Why it is important today.* Geneva, Switzerland: UNISCO.

Tate, S., & J. Swords. (2013). Please mind the gap: Students' perspectives of the transition, in academic skills between a-level and degree-level geography. *Journal of Geography in Higher Education, 37*(2), 230–240.

Tharenou, P., Donohue, R., & Cooper, B. (2007). *Management research methods.* Cambridge: Cambridge University Press.

Westbrook et al. (2013). *Pedagogy, curriculum, teaching practices and teacher education in developing countries.* Available on: http://r4d.dfid.gov.uk

Whittemore, S. (2018). *Transversal competencies essential for future proofing the workforce.* UK: Department for International Development.

Wood, J. (2012). *Global life skills education evaluation: Draft final report.* London: UNICEF

UNESCO. (2004). *EFA global monitoring report 2005.* Education for All: The Quality Imperative. Paris: UNESCO

UNESCO. (2006/07). *World data on education.* Paris: International Bureau of Education

Yin, R.K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage Publication, Inc.

DEVELOPMENT OF A SMART DOLL PROTOTYPE FOR EARLY AGE CHILDREN COLOURS LEARNING IN THREE LANGUAGES

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Abstract
Early childhood is a golden age to learn a language, not only the mother tongue but also a second or third language. However, learning media that can be used to attract children's interest in learning multi-language is still limited. Therefore, this study aims to develop a smart doll that attracts children to learn Javanese, English, and Indonesian. In particular, this media is intended to help children recognise colours in three languages. This research is developmental research with the following steps: First, collecting information about the product being developed, conducting a literature review and interviewing teachers and parents. Second, planning product design in accordance with the results of the needs analysis. Third, developing the initial product form. Fourth, conducting a preliminary field test on 3 children. Fifth, revising the main product. Sixth, field testing on eight children. Seventh, evaluate the testing result for the next development plan. The result of this research is a prototype of a smart doll that is able to recognize colours in 3 languages. Based on the field trials results, the prototype of this smart doll can attract children's enthusiasm for learning colours and improve their ability to recognise colours in three languages. Some things that need to be improved will be discussed further.

Keywords: colour, multilingual, smart doll

Introduction

Mother tongue is defined as the language used by children when they first learn to speak. Mother tongue is not always associated with a person's place of residence. If an Indonesian live abroad but accustomed to speaking in Bahasa Indonesia from the beginning he learned to speak, then the person's mother tongue is Bahasa Indonesia although he does not live in Indonesia (Rahmadi, 2021). Likewise, children living in Yogyakarta, where Javanese language is the local language, do not necessarily have Javanese as their mother tongue. The determination of the mother tongue depends on the environment speech habits in which the child grows up and first gets to know the language.

Mother tongue is important to consider because based on research, children find it easier to learn new language (second language or third language) if it is paired with their mother tongue (Kurniawan, Reliubun, & Fandasari, 2022; Rahmadi, 2021). Based on an interview conducted by the researcher with a kindergarten teacher in Yogyakarta showed that children almost never use Javanese language at school and in everyday life. Children are accustomed to using Bahasa Indonesia in daily conversations and learning in class. In this case, the children's mother tongue is Bahasa Indonesia.

It is a concern that the use of local languages is getting less and less, especially the shifting of Javanese language usage to Bahasa Indonesia within the family communication in Yogyakarta which has become a phenomenon. Research conducted by Bhakti in Sleman (2020), showed that the shifting of Javanese language usage to Bahasa Indonesia was due to the desire to choose a more straightforward language, the lack of Javanese language learning in families, residential areas consisting of various regions of origin, family social stratification, and level of education and family attitudes towards local languages.

On the other hand, it is necessary to introduce children to international languages, to enable them to communicate globally in this 21st century. Children also need to be introduced to international languages so that they have a strong interest in mastering this language, in this case, English mastery. In accordance with the children development achievement level standard (STPPA), children aged 4-5 years have begun to be able to listen to other people's words, both in their mother tongue and in other languages. So, it is appropriate if we begin to introduce the children to a second or third language at an early age.

Derived from the concerns above, the author was moved to develop an appropriate learning media to attract children's interest in learning multi-language. Based on research conducted by Swastyastu (2020) it is known that acquiring a second language will be more effective when using media. Media can be in the form of visual media, audio media, or audio-visual media. In addition, it is also possible to use animated learning media that incorporates elements of motion and sound in teaching a second language (Sun, Loh, & Roberts, 2019). Children who listened to stories from these animated storybooks were also reported to have a higher level of attention listening to stories. These media show that the use of children's senses of sight and hearing is believed to facilitate the acquisition of a second language. Therefore, it is necessary to develop media that accommodates various senses.

As the initial project of this research, the researcher developed a media to recognize colours in three languages. The selected media is a "smart doll". The doll was chosen because it utilizes sound and visual elements from concrete objects. The smart doll referred to in this study is a doll that is able to recognize colours in Javanese language, Bahasa Indonesia, and English. This doll uses an ATmega328 microcontroller and an Arduino TCS3200 colour sensor. The doll's body is wrapped in cloth forming a child-friendly doll. This doll is equipped with a colour recognition sensor and is able to make a sound according to the detected colour and thus named a smart doll. The term smart doll is taken from a term that is usually used to refer to smart toys, namely toys that have been added with digital features such as software or digital materials such as sensors (Komis, et al., 2021).

The design of the doll shape is based on the development of the children's mindset. Children up to the age of 4-5 years still have animistic thoughts, which is having the belief that all objects including inanimate objects have life and the ability to act. This is in line with the stages of playing according to Hurlock (Ardini & Lestariningrum, 2018) that at the peak of the age of 5-6 years, children still often observe their playing toys and talk to them or play with them like their playmates. Dolls are one of the toys that children often talk to.

Next, as one of the initial projects of this research, colour learning for children is chosen as the theme. As part of developing cognitive and language skills, the introduction of colour to children is a must. Colour recognition is a necessary skill in everyday life because many things in this world are symbolized by colours or categorized by certain colours. Therefore, children need to recognize colours before knowing the meanings that are symbolized.

In Permendikbud number 137 of 2014 concerning STPPA, at the age of 3-4 years, children will be able to understand the meaning of colours, such as the meaning of the colour of a traffic light. At the age of 4-5 years, children will start to develop the ability to think logically, for example classifying objects based on function, shape or colour or size. Usually, children are able to sort objects based on 5 series of sizes or colours. At the age of 5-6 years, children will be fully able to classify objects based on colour, shape, and size.

Children's ability to recognize colours is also a part of children's development in developing problem-solving abilities. This is because many problems in everyday life use colour as a symbol. For example: when we ask a child to get a red stuffed bunny, the child needs to know the red colour to solve the problem (Santrock, 2011).

According to their level of development, the easiest way to teach early age children learning is to use concrete objects and direct experience. Children learn through seeing, hearing, and experiencing first-hand (Seldin, 2021). Learning with the colour doll provides an opportunity for children to experience learning directly through concrete objects and fun game activities.

In this development research, colour recognition is given using Javanese language, English, and Bahasa Indonesia with a total of 12 colours introduced. Colour recognition is done through the activity of playing with the doll. This play activity is intended to create a sense of fun and joy in children (Pasek, Golinkoff, & Eyer, 2003) because children need to have fun in learning (Pitamic, 2013).

Method

This research is developmental research conducted in seven steps: First, the researcher collects information about the product to be developed, conducts a literature review, and performs needs analysis by interviewing teachers and parents. Second, the researcher designs products according to the results of the needs analysis. The third step is developing the initial product which begins with analysing the test results of the prototype doll to see the performance of the prototype doll developed based on the algorithm used and the validity of the developed system. The fourth step is to validate. Validation of project results consists of two validation classifications, namely validation from the content side and validation from the application side. Fifth, revising the main product. Sixth,

field testing on eight early age children. Seventh, evaluate results for the next development plan.

Figure 1. Research methodology

Findings and Discussion

This research is developmental research conducted in the following steps: First, the researcher collects information about the product to be developed, conducts a review of various literature, and performs needs analysis by interviewing teachers and parents. There are various studies on colour recognition efforts for early-age children. For example, Syukur, Djahimo, & Leba (2020) introduced puzzles as a learning medium for colour concept learning. Hardiyanti, Husain, and Nurabdiansyah (2018) designed a rubik's media to introduce colour to early age children. Ariona (2014) developed a colour recognition educational game as an Android-based learning medium for pre-schoolers. This media is proven to be worthy of making children interested in learning about colours and increasing their creativity and activities. Realizing the importance of basic colour recognition in early childhood, Yudha, Ardhiyanta, Haris, and Widiarti (2016) began to develop applications that were able to recognize basic colours. Their application succeeded in detecting the basic colour using a sensor. This research was then further developed to be able to detect more colours.

The four studies above showed that colour recognition is indeed a basic thing that needs to be understood by early age children. A further needs analysis was carried out by the researcher by conducting interviews with teachers and parents of students. The result showed that many children do not understand colours in Javanese language although they live in Java because they do not use Javanese language in their daily conversations. On the other hand, they were also introduced to English as an international language. It is triggering a concern that the interest in using Javanese language will decrease among children. Therefore, it is necessary to design a media that is able to attract children to learn Javanese language in addition to Bahasa Indonesia and English.

This various language media design is also driven by the belief that mastering a second language other than the mother tongue has its own advantages. This is also believed by Ambarini, Indrariani, and Zahraini (2019) who taught early childhood teachers the importance of preparing lesson plans and teaching children various health learning topics in two languages, namely the mother tongue, which was Bahasa Indonesia, and a foreign language, which was English. The analysis result conducted by Annisa (2021) showed that various language mastery has a positive impact, one of which is to support children in mastering one of the 21st-century skills that need to be mastered by children, namely the communication skills. The ability of children to master more than one language can make children easily adapt to their social environment. In addition, mastering more than one language will give children a sense of pride.

The second step is planning the product's design according to the results of the needs analysis. The design stage is aimed at obtaining colour recognition algorithms, designing data streams, designing hardware and puppet shapes, and designing the sound that will come out as the output of the dolls. Some of the design provisions that need to be considered when developing the tool consist of what objects to use, what background of the object will be, how will the lighting be when capturing objects, how many colour components are in the object and how wide it will be, what is the distance from the object to the camera and what is the slope of the object, what kind of sound will come out of the speakers, what will the doll look like, and what tools will be used to build the doll's primary machine. In developing a software system with an algorithm chosen to recognize colour, the steps taken for system development are designing a system using a colour classification algorithm, analysing the test data candidates by studying the data and researching the representation of the test data in its digital format. Afterwards, implementing the system design by making a prototype of the colour recognition system, and carrying out trials with a prototype of the colour recognition system that has been completed using data that has been prepared previously (Widiarti, Nugroho, Pinaryanto, & Kurniastuti, 2020).

The third step is to develop the initial product starting with analysing the test results of the prototype system to see the performance of the prototype developed based on the algorithm used and the validation of the developed system. The next big step is to make the doll machine. In this case, using the Arduino Uno ATmega328 board which is relatively cheap and easy to obtain. In general, there are only three tools used, namely the board, colour sensor, and speaker to produce a sound which will be the learning source for the early-age children. The next step in developing the tool is to make the body and clothes of the doll with Arduino as the hardware inside the body. The following is the initial appearance of the developed product.

Figure 2. Initial product design

The fourth step is to validate. Validation of project results consists of two validation classifications, which are the validation from the content side and validation from the application side. The validation of the content side means the validation of the Javanese language learning materials that will be taught. The validation from the application side means the validation of the black blox application system produced and the effectiveness and efficiency of the tool. Three children are involved in this trial. From the test results, the doll incorrectly detected some colours. This indicates that the colour spectrum used in machine calibration needs to be reviewed. From the application side, children seem

enthusiastic and interested in using dolls to recognize colours. The other thing to be improved is the user-friendliness. The doll needs to be used by children on a mobile basis so it requires a battery instead of electricity from an adapter to make it more flexible for mobility.

The fifth step is to revise the main product. Based on the test results, various improvements were made. From the hardware, the power source of the doll is changed from an adapter to a battery to make it more mobile and flexible. From the display, the appearance of the doll has been changed to make it more attractive for children and resembles a character that is more comfortable to talk to. In accordance with the initial goal that this doll will introduce children to three languages, the software of this doll is equipped with three languages, namely English, Bahasa Indonesia, and Javanese language (the application developed only has Javanese language in the previous experiment). Next, a guidebook was added to make it easier for the companions who would assist the child in using the doll to recognize colours.

Picture 3. Product design after revision

After several revisions were made, the next step was to conduct another test with a limited group consisting of eight children. The results of this trial showed that the doll could help children learn colours. Of the three languages introduced, eight students found it difficult to recognize colours in Javanese language. Colour recognition in Bahasa Indonesia and English was much easier for children to master. All students seemed enthusiastic to try using this doll's assistance to identify colours. They were amazed because the doll could speak in three languages according to the coloured papers that were shown to the doll. The obstacle faced in this trial was that the doll had difficulty recognizing colours other than the coloured papers that had been prepared by the developer. Children tend to be driven to use the doll for further exploration, picking up a variety of colourful objects. Unfortunately, not all of them could be detected by the doll due to the difference in the colour spectrum that could be detected. The colours that can be detected by the doll are according to table 1.

Table 1. List of Colours the Doll Can Detect

Bahasa Indonesia	Javanese Language	English
Merah	Abrit	Red
Putih	Pethak	White
Kuning	Jene	Yellow
Hitam	Cemeng	Black
Hijau	Ijem	Green
Biru	Biru	Blue
Ungu	Wungu	Purple
Coklat	Coklat	Brown

Jingga	Oranye	Orange
Merah muda	Ping	Pink
Biru muda	Biru enem	Light blue
Hijau muda	Ijem enem	Light green

In addition to the colours above, when the doll's sensor detected an unprogrammed colour spectrum, it would produce an additional sound of "undetected". From the testing results with children, this sound became a separate learning tool for them because it showed that this smart doll was not a living thing that knew everything. The doll sounds based on the program that had been designed. If the command had not been programmed, the doll would not understand it. With this experience, children could be motivated to learn more about various colours. The honesty of "undetected" also motivated children because it encouraged children to keep looking for information by interacting with adults or teachers.

In the principle of developing educational media, the auto-correction principle was indeed a criterion that must be met, namely, learning media should be designed to help children learn independently because they have error control (Kurniastuti, Mbawo, 2019). As in this smart doll, when the sensor worked properly, all objects that matched the colour list in table 1 could be identified properly. The sound of this doll regarding colour was a manifestation of error control. Students knew that an object is red because the doll sounds red.

The interesting thing from the results of this limited field trial was that there was an increase in mastery of recognizing colours in three languages. Before colour recognizing smart doll was given to the children, the highest score they got was in recognizing colours in Bahasa Indonesia, followed by English and Javanese language. Here it appears that Javanese was indeed the language they rarely heard although they live in Java. One of the advantages of this smart doll was that it produced sounds according to the object brought to the sensor in three languages at once. For example: when a red object was brought near to the sensor, the doll would make sounds: "*merah*", red, and "*abrit*". By knowing the pronunciation of colours in Bahasa Indonesia first, it helped they were helped to understand the other language of "*merah*" in English, namely red, and in Javanese language, namely "*abrit*". This is in accordance with research from Kurniawan, Reliubun, & Fandasari, (2022) and the opinion of Rahmadi (2021) that in learning something new in a foreign language (second language or third language), children will find it easier to learn if paired with their mother tongue.

In further observation, children who were amazed by the doll that was able to make sounds in three languages, slowly understood that this doll taught them to learn something, which was colour. The word "*abrit*" which was previously unfamiliar to their ears became familiar because the doll provided ample opportunity for children to repeat it until they were able to master what they were learning. This is in accordance with the natural tendency of children in the learning process, they like a repetition of something that is considered interesting and makes them learn new things until they really master it (Seldin, 2017). This smart doll is practical for kids to use if they want to do repetition.

The seventh step is to evaluate the product for an improvement plan. From the trial results, it was necessary to have an improvement to enable the doll

recognizing colours from various spectrums considering the characteristics of children who like to explore with objects around them.

Children have their own pleasure when invited to see the natural surroundings together. Watch various insects on the leaves, the drops of water on the leaves, the colour of the sunset, the view from the mountains, the silence or ripples in the lake, the movement of the sea, the wind in the trees, or simply enjoy the beauty of flowers and bees in the neighbour's garden. Children enjoy taking a magnifying glass to explore up close, touching things with their hands, listening to the movement of trees and grass, and smelling rain or flowers (Davies, 2019). Children are active learners. Children move in search of stimulation that can increase their opportunities to learn. Children use their whole body as a tool to learn and engage all their senses. Children are energetically looking for their own experiences and looking for ways to produce maximum potential (Sutrisni & Marisa, 2018).

Of course, this developed media cannot represent all children's activities in this world. However, it is expected that this colour doll can be used by children for natural exploration in the future. For example, a child could bring the doll to nature, take objects such as leaves of various colours to the sensor and the doll would identify the colour. Afterwards, the child could try the objects around with various colours. Thus, the child will have the experience of moving in nature, touching various objects, and learning colours from the sound made by the doll. Further development of this doll is certainly highly expected.

Learning in nature to find various kinds of coloured objects as mentioned above is an example of a discovery learning strategy. This learning is effective and fun because it requires active participation from children and an environment that encourages children's curiosity. If there are obstacles in the field related to the doll's sensor that cannot recognize all the colour spectrums, students will be invited to identify what objects can be detected by this smart doll. This actually becomes a new discovery because it is based on problems that occur in the field that stimulates inquiry learning where students are invited to think further to find new discoveries (Mulyasa, 2017).

The next development is to add a song feature that can be played like the one on Ami-chan doll from Japan (Larasati, 2021). Researchers have developed songs related to colour recognition in three languages, but they have not yet been integrated with the software of the dolls.

Conclusion

The results of the development of a smart doll prototype to recognize colours in three languages for early-age children show good results in terms of increasing children's enthusiasm in learning to recognize colours in three languages. The voice features in the dolls make children more enthusiastic to learn because the smart doll can help them learn independently although they are not assisted by parents or teachers. However, in terms of development, the doll still needs to be improved, such as expanding the colour spectrum that can be recognized by the doll so that children can learn to explore colours in the natural environment.

References

Annisa, A. (2021). Analisis perkembangan sosial pada anak bilingual di abad 21. *Mitra Ash-Shibyan: Jurnal Pendidikan dan Konseling, 04*(01), 31-46. https://doi.org/10.46963/mash.v4i01.223

Ambarini, R., Indrariani, E.A., & Zahraini, A. D. (2019). Pembelajaran bilingual *English for health* berbasis bahasa ibu bagi guru paud kota semarang. *Journal of Dedicators Community, 3*(2), 111-132. Retrieved on June 20, 2022, from https://ejournal.unisnu.ac.id/JDC/article/view/835

Ardini, P. P. & Lestariningrum, A. (2018). *Bermain dan permainan anak usia dini*. Nganjuk: Adjie Media Nusantara.

Ariona NA, R. (2014). Game edukasi pengenalan warna sebagai media pembelajaran anak usia prasekolah berbasis android. *Jurnal Teknik Elektro, 6*(1). https://doi.org/10.15294/jte.v6i1.3573. Retrieved on June 20, 2022, from https://journal.unnes.ac.id/nju/index.php/jte/article/view/3573

Bhakti, W. P. (2020). Pergeseran penggunaan bahasa Jawa ke bahasa Indonesia dalam komunikasi keluarga di Sleman. *Jurnal Skripta 6*(2), 28-40. Retrieved on June 20, 2022, from https://journal.upy.ac.id/index.php/skripta/article/download/811/708

Davies, S. (2019). *The montessori toddler: A parent's guide to raising a curious and responsible human being*. New York: Workman Publishing.

Hardiyanti, Y., Husain, M. S. & Nurabdiansyah, N. (2018). Perancangan media pengenalan warna untuk anak usia dini. *Jurnal Imajinasi, 2*(2), 52-59. https://doi.org/10.26858/i.v2i2.9553 Retrieved on June 20, 2022, from https://ojs.unm.ac.id/imajinasi/article/view/9553

Komis, V., Karachristos, C., Mourta, D., Sgoura, K., Misirli, A., & Jaillet, A. (2021). Smart toys in early childhood and primary education: A systematic review of technological and educational affordances. *Applied Science. 11*(18), 8653. https://doi.org/10.3390/app11188653

Kurniastuti, I., & Mbawo, F. (2019). *Kreatif mengajar bahasa dengan montessori*. Yogyakarta: Sanata Dharma University Press.

Kurniawan, M. A., Reliubun, A. S., & Fandasari, M. (2022). Bentuk konkret metode baca-tulis berbasis bahasa ibu (contoh kasus bahasa laboya). *Stilistika: Jurnal Pendidikan Bahasa dan Sastra, 15*(1), 13-25. http://dx.doi.org/10.30651/st.v15i1.9161.

Larasati, G.A. (2021, August 22). Perusahaan mainan Jepang rancang boneka pintar untuk obat rindu lansia pada cucu. Retrieved on June 21, 2022, from https://www.liputan6.com/lifestyle/read/4638055/perusahaan-mainan-jepang-rancang-boneka-pintar-untuk-obat-rindu-lansia-pada-cucu

Mulyasa, H.E. (2017). *Strategi pembelajaran PAUD*. Bandung: Remaja Rosdakarya.

Pasek, K.H., Golinkoff, R.M., & Eyer, D. (2003). *Einstein never used flash cards: Bagaimana sesungguhnya anak-anak belajar dan mengapa mereka harus banyak bermain dan sedikit menghafal.* Bandung: Kaifa.

Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 137 Tahun 2014 Tentang Standar Nasional Pendidikan Anak Usia Dini. Jakarta: Kementrian Pendidikan dan Kebudayaan Negara Republik Indonesia.

Pitamic, M. (2013). *Child's play: Permainan dan aktivitas Montessori untuk bayi dan batita Anda.* Yogyakarta: Pustaka Pelajar.

Rahmadi, U. T (2021). R. E., Purba (Ed.), *Dampak penggunaan bahasa ibu di kelas awal pendidikan dasar pada hasil belajar siswa* (pp. 137-156). Jakarta: Pusat Standar dan Kebijakan Pendidikan.

Santrock, J. W. (2011). *Lifespan development 13ʰ edition.* New York: Mc Graw Hill.

Seldin, T. (2017). *How to raise an amazing child the Montessori way* (2ⁿᵈ ed.). New York: DK Pub.

Seldin, T. & McGrath, L. (2021). *Montessori for every family. A practical parenting guide to living, loving, and learning.* London: Dorling Kindersley Limited.

Sun, H., Loh, J., & Roberts, A. C. (2019). Motion and sound in animated storybooks for pre-schoolers' visual attention and mandarin language learning: an eye-tracking study with bilingual children. *AERA Open, 5*(2), 1-19. https://doi.org/10.1177/2332858419848431

Sutrisni, E., & Marisa, M. *Strategi pembelajaran di Lembaga PAUD.* Banten: Universitas Terbuka.

Swastyastu, L.T.J. (2020). Manfaat media pembelajaran dalam pemerolehan bahasa kedua anak usia dini. *Pratama Widya: Jurnal Pendidikan Anak Usia Dini, 5*(1). Retrieved on June 20, 2022, from https://www.ejournal.ihdn.ac.id/index.php/PW/issue/archive

Syukur, A., Djahimo, S. E. P., Leba. M. G. (2020). The implementation of puzzle as a learning media to introduce the colour concept to class b students of munatuan early childhood education (paud) in kupang district. *Proceeding of The Non-Formal Education International Conference 2020.* https://doi.org/10.29037/digitalpress.46378

Widiarti, A. R., Nugroho, R.A., Pinaryanto, K., & Kurniastuti, I. (2020). *Pengembangan prototipe boneka guru warna dasar RGB berbahasa jawa.* Malang: Sentrin.

Yudha, Y., Ardhiyanta, D., Haris, L., & Widiarti, A.R. (2016). Aplikasi pengenalan citra warna dasar. *Jurnal Ilmiah Widya Teknik, 15*(1), 54-57. Retrieved on June 20, 2022, from http://journal.wima.ac.id/index.php/teknik/article/view/1524/pdf

ENGLISH EDUCATION MASTER STUDENTS' PERCEPTIONS ON ONLINE LEARNING DURING COVID-19 PANDEMIC

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Abstract
ELT enterprises are always ever-changing in these recent years due to the learners' learning needs, preferences, interests, and proficiency. This progressive change is noticeable during this covid-19 pandemic where all educational institutions are commissioned their learners to study from home with the support of technological interfaces. This current small-scale qualitative study was an attempt to discover the specific perspectives upheld by English Education Master Students concerning the internalization of online EFL learning activities during these recent 2 year periods. To fulfill this research objectivity, the narrative inquiry was employed to fully attain the authentic data derived from the research participants manifested in the form of stories. In the short-term data gathering processes, 5 open-ended written narrative inquiry questions were distributed to 2 English Education Master Students of Sanata Dharma University, batch 2020. Anchored on the obtained research results, online EFL learning activities are quite beneficial in promoting more fruitful learning outcomes and embracing learners' learning pace in absorbing the imparted learning materials. Hence, it is worth highlighting that this learning method is appropriately suitable for nowadays target language learning venture due to its practicality and feasibility. Some specific suggestions were also depicted in the last section.

Keywords: covid-19 pandemic, graduate students, online learning

Introduction
        It is still fresh in our mind that the covid-19 outbreak forced all people to not have direct interactions with others due to the precarious impacts imparted by this virus. As an effective solution, governments all over the world require employees to work from home to prevent the massive transmission of this virus. Without exception, education sectors simultaneously commissioned teachers and learners to utilize an online learning method from their homes. This phenomenon had cast a higher level of anxiety and shock since meaningful learning encounters heavily depend on the quality of internet connectivity, specific teaching-learning instructions, and technological mastery. Anwar and Wahid (2021) revealed that the majority of university EFL learners experienced frustrating, boring, and taxing

learning dynamics due to the limited internet connection and low quality of teaching-learning engagement in online learning sessions. Regarding its definition, online learning is a learning mode in which learning community members are equipped with stable internet connectivity and qualified technological platforms to endure such meaningful learning enterprises in the light of a particular distance. Sahoo (2020) clearly defines online learning as one of the effective distant approaches where teachers and learners can work hand-in-hand to expand their targeted subject knowledge more constantly. More specifically, there are 2 types of online learning worthwhile to be incorporated during the covid-19 pandemic namely synchronous and asynchronous.

In the synchronous mode, all learners are required to enter the meeting by utilizing a particular meeting ID or codes shared by the host. While in an asynchronous mode, all learners are allowed to open and download the uploaded learning materials anytime without being restricted by the formal learning period. These above-explained conceptions are closely correlated with an online learning theory propounded by Setyowati et al., (2021) mentioning that educators all around the globe have to be able to make use of both synchronous and asynchronous online learning modes to allow learners to undergo mutual interactions with teachers as well as other learning companions. While, at the same time, forge their autonomous learning behavior outside of the daily routine online classroom sessions.

In the EFL learning realm, the internalization of an online learning mode during the covid-19 pandemic has also brought about a vast range of positive influences. With the support of online EFL learning enterprises, learners are more capable of fostering their target language competencies into the utmost levels since unlimited information can be intensively accessed by them. As such, they have progressively improved their communicative competencies, even without the continual guidance addressed by their teachers. This first advantageous value is tightly interwoven with the finding of Rahmawati (2016) discovering that an online EFL learning venture has fully offered a learner-oriented learning environment, which eventually resulted in better-facilitated English learning processes.

Other than that, an online EFL learning approach can enable all learners to fully comprehend the imparted teaching materials delivered by their teachers due to the daily classroom recordings posted on the designated learning platforms. This second advantage is mutually interlinked with an online learning theory adduced by Mahyoob (2020) theorized that EFL learners have thoroughly gained a more exhaustive understanding of the learning materials addressed by their teachers with the presence of an online learning mode since they can watch the classroom recordings repeatedly and independently after the classroom time. Moreover, online EFL learning activities have terrifically elevated learners' critical thinking, problem-solving, and higher-order thinking skills as they are continually commissioned to review the uploaded learning materials autonomously with minimum assistance from their teachers and learning counterparts. In accord with the above-mentioned benefit, Hazaymeh (2021) unveiled that EFL learners had progressively transfigured into more competent, self-reliant, and mature academicians through online learning enterprises since they felt urgent to comprehend all the learning materials entirely.

Apart from those above-explicated advantageous values, online EFL learning systems are not without shortcomings. Firstly, intimate, warm, and friendly learning atmospheres are sparse in online learning sessions gradually diminishing learners' social together with collaborative skills that they can easily hone in face-to-face classroom activities. Ho et al., (2017) highly recommend that educational stakeholders, educators, and policymakers establish more collaborative networking with each other to devise more effective pedagogical approaches, which correspond to the online EFL classroom interfaces undergone by learners. In the same vein, online EFL learning activities are also deemed as a premature knowledge-construction process where there is a void of authentic target language learning experience. It can be rephrased that learners can potentially encounter various target language impediments with the minimum moral, cognitive, and psychological supports from teachers that may result in learning disengagement. In agreement with the view expressed above, Ahmad (2016) concurred that the inducement of meaningful online EFL learning processes highly required continuous practices, intensive training, and richer experiences unless this learning type would probably hinder learners' motivation, resilient, and target language competencies development since they dealt with a pile of learning obstructions individually. Interestingly though, those 2 aforementioned issues do not halt there.

As the majority of EFL learners have difficulties in obtaining decent technological devices for their everyday online learning sessions, they are more likely to skip the classes. This arising hurdle is in conjunction with the finding of Wahab and Iskandar (2020) unfolding that a considerable number of Indonesian EFL learners are demotivated to attend their daily classes since they do not possess gadgets that can fully support their learning processes. The ultimate hindrance deals with the presence of internet connectivity. For meaningful online EFL learners, it is undeniable for all learners to connect their electronic devices with a stable internet connection. EFL learners dwelling in rural areas are not able to attend their learning activities due to the internet connection problem. In a profound investigation of online EFL learning conducted in Indonesia, Nashruddin, Alam, and Tanasy (2020) unveiled that poor internet connection was ascribed as one of the serious obstacles for EFL learners residing in rural areas. Thus, they advocated for the government to set up a more solid collaborative networking with all educational stakeholders to provide steady internet connectivity for them to undergo more meaningful learning enterprises.

Before the researcher explained the noticeable gap and the significance of this current study, it is worth mentioning that 5 relevant prior studies concerning online EFL learning during the covid-19 pandemic had been run in Indonesian educational contexts. The first study was conducted by Rahayu and Wirza (2020) discovering that the majority of Indonesian EFL teachers had valued the effectiveness of online learning since it successfully preserved their valuable time to accomplish other indispensable administrative works. In the second identical investigation, Syauqi, Munadi, and Triyono (2020) reported that most university EFL learners appreciated the implementation of online learning due to its practicality, flexibility, and accessibility. However, they sanctioned that the teachers' teaching materials were incongruent with their particular learning needs, interest, and preferences. Rinekso and Muslim (2020) unearthed that a considerable number of university EFL learners

were appreciative of the incorporation of online learning since they had progressively transformed into more critical, proficient, and independent target language academicians. While the poor internet connectivity that occurred in their institutions remained unsolved. Tanjung and Utomo (2021) found out that Indonesian university EFL learners were capable of improving their target language skills more significantly after being exposed to online learning activities. On the other hand, they also believed that it is urgently needed for educational stakeholders along with experts to design more suitable pedagogical approaches that best suit specific online learning dynamics to promote a higher degree of proactive learning engagement in the upcoming events.

In the last study, Pasaribu and Dewi (2021) unfolded that a great number of Indonesian university EFL learners had gradually become more reflective, self-reliant, and active learning participants while participating in a wide array of online learning sessions with the constant support of decent technological devices as well as appropriate teaching-learning activities creatively designed by the teachers. In line with the above-explicated studies done by the previous researchers, it is worth noting that there is still infrequent literature investigating graduate university EFL learners' perceptions toward the utilization of online learning during the covid-19 pandemic. Based on the researcher's framework, it is also of crucial importance to explore graduate university EFL learners' perceptions on online learning mode amid the covid-19 outbreak to offer richer perspectives for our educational stakeholders, experts, practitioners, and policy-makers concerning the suitable implementation of pedagogical approaches, learning activities, and teaching materials rewarding for the advancement of future online learning enterprises.

Anchored on this research objectivity, the researcher expectantly hoped that this small-scale qualitative study can consolidate our knowledge, perspectives, and beliefs of online EFL learning enterprises during this ever-changing situation in the hope that our educational basis will not merely heed severe attention toward traditional teaching-learning venture after the post-pandemic era, yet make us realize that online learning, when combined with onsite learning approaches, can potentially bring about more impactful influences for the progression educational systems. This central concern of this present investigation was manifested in this single research problem: (1) what are the specific perceptions held by English Education Master Students regarding the implementation of online learning during the covid-19 pandemic?

Method

This qualitative study was run with the help of narrative inquiry to obtain more authentic data from the truth told by the research participants. Ary et al., (2018) adduce that narrative inquiry can potentially provide a sound basis for the researchers to obtain more robust research finding it is consolidated by the apparent stories disseminated by research participants. Concerning the aforesaid nature of this current study, the researcher planned to distribute 5 open-ended written narrative inquiry questions to 2 invited interviewees. These 2 randomly-chosen research participants were English Education Master Students batch 2020 of Sanata Dharma University, Yogyakarta.

The researcher held a strong belief that reliable data would be attained from these research participants since they have been engaging in online learning processes at the onset of their new academic entrance until this present moment. It indicated that they have experienced online EFL learning activities for 1.5 years approaching their last semester in this new academic year. Since they are still engaging in English Education Master Study Program, the researcher aimed to conduct the data gathering processes shortly before they graduate to thoroughly offer renewed as well as credible findings based on their perception concerning online EFL learning enterprises. In analyzing the data, the researcher attempted to subdivide the frequently-appeared findings into some specific themes. After accomplishing this first process, the researcher delineated the obtained findings argumentatively with the accompaniment of pertinent prior findings and theories to generate more robust research results contextual to be internalized in present as well as future online EFL learning enterprises.

Findings and Discussion

This following part attempted to heed more profound attention of argumentatively explicating 2 major obtained findings derived from the invited interviewees. Those 2 major themes are (1) Online EFL learning improved the desired learning outcomes and (2) Online EFL learning activities enabled learners to learn at their own pace.

Theme 1: Online EFL Learning Improved the Desired Learning Outcomes

Apart from the contradictory theories and findings depicted in the prior subsection, the first interviewee frankly confessed that the internalization of online EFL learning enterprises had progressively brought about more fruitful learning outcomes for her. This indispensable learning reward is predominantly caused by the independent nature of online EFL learning where all learners are individually commissioned to possess a higher level of understanding of the shared learning materials. More importantly, the first interviewee simultaneously mentioned that the incorporation of online EFL learning is highly beneficial for learners who are easily get distracted by other irrelevant matters occurring in the physical classroom circumstances resulted in the full attainment of fruitful learning outcomes. All these above-recited personalized online EFL learning experiences are closely associated with the prior finding of Allo (2020) finding out that there was a higher degree of intention consented by both university teachers and learners to constantly harness online learning approaches during the Covid-19 pandemic due to the significant escalation of learning autonomy and concentration. In another identical study, Atmojo and Nugroho (2020) unfolded that online EFL learning activities, only if taken with great care, could bring learners closer to achieving more holistic target language learning outcomes. The subsequent interviewee 1 excerpts are also congruent with the above-mentioned conceptions.

[Interviewee 1: *Of course, being able to learn more independently, being able to access many learning resources, and being able to explore various learning-enhancing software.*]

[Interviewee 1: *I think this online learning is very helpful for individuals who are easily distracted like me because I can focus on the material, assignments, and lecturers' explanations without having to be distracted by the business of my friends in class.*]

Furthermore, this meaningful learning did not solely emerge without a presence of foundational efforts. As already alluded by the first interviewee, it is undeniably important for EFL learners to establish, preserve, and elevate their self-motivation amid a vast array of endless challenges during online learning sessions. One of the valuable actions that need to be taken into account by global university EFL learners is to constantly stick to the designated learning objectivities. By sticking tightly to the specific learning goals, these learners can potentially transform into more highly-motivated academicians. When they have transfigured into more desirous knowledge seekers, these learners will be more capable of devising plenty of efficient strategies corresponding with their learning contexts. These contentions are tightly interwoven with the finding of Nartiningrum and Nugroho (2020) unearthing that in the light of online EFL learning activities, learners will be more able to become more thoughtful, strategic, and resilient academicians adept in overcoming the particular learning obstructions. Concerning the aforesaid findings, Farrah and Al-Bakry (2020) theorized that the consistent support imparted by the decent technological tools, teachers, and educational stakeholders, would gradually enable university EFL learners to strategize the chosen learning strategies to accomplish the specific learning obstacles that may potentially hinder their learning endeavor. Almusharraf and Khahro (2020) unveiled that the appropriate online EFL teaching-learning materials, instructions, regulations, and programs could terrifically allow university learners to transfigure into more effective problem-solvers as well as judicious strategy-makers since they are all armed with the hands-on learning enterprises in each session. These perspectives shared common ground with these interview excerpts obtained from the first teacher.

[Interviewee 1: *So to understand each class requires me to apply a different strategy. Like in the Teaching Practicum class where the lecturer gives a lot of instructions, then I will take a lot of notes.*]

[Interviewee 1: *As a student, in an effort to maintain engagement in class is to maintain my motivation and learning goals. I try to wait for explanations and understandings that will come side by side with the limited support from lecturers in teaching in class. Like thinking "what will I get today?"*]

Irrespective of the advantageous online EFL learning benefits mentioned before, it is also thoughtful and useful for global EFL teachers, learners, and practitioners to advance future online learning practices for the betterment of our educational journeys. This belief is mutually aligned with the first interviewee's learning experience. She forthrightly acknowledged that online EFL learning events she is had undergone offered a wide range of challenges. The first challenge deals with the absence of mutual learning communities.

As noted previously, both EFL teachers and learners experience taxing moments to establish more intimate rapport with each other through online learning activities. This matter occurred since the interactions by them are strictly confined by the technological interface disabling them to precisely know their current feelings, emotions, and learning difficulties. Another strenuous matter that worsens this distant learning situation is the scarcity of intensive social interactions. According to the first interviewee, since the university teachers and learners can merely assemble in one particular technological platform, it is extremely challenging for them to collaboratively promote meaningful, intimate, and effective learning encounters as they previously did in their face-to-face classroom surroundings. As an effect, learners will feel reluctant to proactively disseminate their ideas, thoughts, and opinions due to the obscure facial expressions displayed by their teachers.

It can also be phrased that learners are gradually demotivated to spread the diverse fields of knowledge when they are not able to discern the positive interactions showcased by their teachers. Efriana (2021) remarked that worldwide EFL teachers should be equipped with intensive online teaching-learning training to suffice their learners' cognitive, emotional, and psychological needs thoroughly, which in turn, is impactful to transform them into more highly-desirous knowledge discoverers. Similarly, Octaberlina and Muslimin (2020) averred that it is increasingly essential for nowadays ELT experts, practitioners, and educators to establish more mutual collaborative networking in providing a more interactive online EFL learning venture in which all learners can endure a more pleasurable learning atmosphere. Ultimately, Hazaymeh (2021) revealed that a considerable number of university EFL learners are easily feeling alienated without the adequate exposure of intimate, positive, and mutual interactions as they oftentimes experienced in their onsite learning events. This negative learning experience may hazardously result in demotivated feelings. All these above-explicated findings are favorably corroborated by the first interviewee's excerpts in these subsequent lines.

[Interviewee 1: *The limitations of real face-to-face space which causes us to not be able to understand the character and mood of lecturers and students. This makes us reluctant to ask questions, especially when we encounter assignments, especially from new lecturers we don't know.*]

[Interviewee 1: *In the end, I had trouble doing my homework. Then because online classes make interpersonal relationships not good so I am not able to get to know other friends so it feels awkward when doing group assignments.*]

Theme 2: Online EFL Learning Activities Enabled Learners to Learn at Their own Pace

Concerning the above-depicted theme, it can be parsed that the internalization of online EFL learners successfully allowed learners to learn all the targeted subject materials at their own pace. Congruent with this theme, the second interviewee openly avowed that she enjoyed online EFL learning for almost 2 years on her campus due to the gradual emersion of better-facilitated target language classes. In

this regard, better-facilitated target language classroom contexts refer to the full acknowledgment of individual differences in which each learner can markedly elevate their target language competencies in harmony with their learning proficiency. Admittedly, this thorough acceptance is believed to not only enhance their language skills but also promote a wide array of positive learning behaviors such as durable motivation, a higher level of focus, and a strong willingness to understand the addressed learning materials more comprehensively.

Furthermore, the second interviewee also supported further implementation of online EFL learning enterprises since more pleasurable, interactive, and engaging learning activities can potentially be wholly experienced by all learning community members. Al these rewarding learning benefits took place since there are a vast array of sophisticated learning platforms that maintain learners' learning interests such as Worldwall, Quizziz, Kahoot, Bamboozle, and Quizlet. As the exhaustive attention of our target language learning venture has gradually been shifted into student-centered modes wherein all learners have the equal chances to forge the 4 integral skills of English; reading, writing, listening, and speaking, it is doubtless to say that the advancement of online EFL learning dynamics will be of great significance to supportively assist all teachers as well as learners to achieve more holistic educational objectivities in the long run. All these above-explained findings are closely interlocked with the finding of Rinekso and Muslim (2020) discovering that a great number of university EFL learners encouraged the continuity of online EFL learning in future events since they were capable of maximizing the target language competencies in the light of enjoyable and safe learning environments. Akhter (2020) also advocated worldwide for EFL teachers to offer more flexible, innovative, and favorable target language learning enterprises through online learning sessions to entirely allow learners to enjoy those ongoing virtual learning processes. In the same vein, Khatoony and Nezhadmehr (2020) propelled all globalized ELT experts, practitioners, and educators to invent more interactive, dynamic, and creative online EFL learning dynamics for the learners to become more proactive academicians highly desirous of discovering a wider array of facts throughout their lives. In accord with these above-cited findings, the second interviewee's interview excerpts are also worth observing in these following lines.

[The second interviewee: *I also believe that online learning using some online platforms might encourage students' concentration to pay attention to the particular materials or explanations of the lecturers. It is also worth recognizing in this section that the stronger establishment of self-regulation allowed EFL teachers to be more professional educators.*]

[The second interviewee: *Online learning also allows self-paced learning for each student. In online learning, the students learn at their own pace without feeling worried about other students' learning pace.*]

[The second interviewee: *Since today's learning activities take full advantage of the current technology using platform variations, the courses are more interactive, interesting, and engaging.*]

To better facilitate the ongoing online EFL learning processes, the second interviewee strategized a vast range of effective strategies to overcome various learning barriers that may hinder her learning motivation. The first strategy she oftentimes utilized was to understand all the essential technical matters related to technology. It is inevitably pivotal for digital native learners in this modern age to completely gain a higher level of comprehension toward the technological platforms applied in their classroom learning circumstances. By doing so, they will not only undergo such a meaningful target language learning encounter but also master the technological matters beneficial for their future working places in the future. Zou et al., (2021) strongly encouraged all EFL learners to possess a more comprehensive understanding of the technological tools they frequently harness in the classroom learning surroundings to ease their personalized learning encounters and transform them into more technological-literate academicians. Ngo (2021) outspokenly postulated that it is extremely crucial for EFL teachers to firstly become good role models in making use of technological devices in the presence of their learners to constantly prompt them to vehemently explore these supportive online platforms.

Again, the efficient utilization of technological platforms in an online EFL learning venture is not without its drawbacks. The second interviewee specifically marked that since online EFL learning processes heavily depend on the quality of internet connection, she sometimes was not capable of undergoing meaningful learning encounters as she intended for. As such, she underwent an arduous learning period while attempting to comprehend all the learned learning materials independently. Acknowledging this common learning issue, the second interviewee still ingrained such a robust learning endeavor outside of the online classroom vicinities by creating a group of supportive learning communities in which all learning members can continuously provide intensive cognitive, moral, and psychological supports to each other.

These proactive learning actions are commendable and worthwhile to be incorporated during the taxing online learning hurdles due to the potent learning supports that can potentially trigger university EFL learners' learning motivation. In the same stratum, Oraif and Elyas (2021) highly recommended globalized university EFL learners to generate more readily-established personalized learning objectivities during, whilst, and after engaging in online learning enterprises to anticipate the potential upcoming hindrances that may reduce their robust learning motivation. In conjunction with these findings, Han et al. (2021) adduced that it is of great importance for worldwide university EFL learners to heed their higher level of attention toward the personalized learning agenda they already set up beforehand by forming sustainable learning communities wherein all learning members can address continual support amid inconvenient online EFL learning events. With an eye to the above-explained findings, the second interviewee also shared an identical notion as follows.

[Interviewee 2: *Some online learning classes live through zoom meeting and videoconferencing could not run well and I need to suddenly shut down or restart*

the computer device. There is also a difficult moment for me when I get a blackout and my Wi-Fi is getting down.]

[Interviewee 2: *Yes, of course, I utilize the particular strategies while participating the online learning. Some suitable strategies were utilized to help me deal with some language issues during the online learning. Since I do not master the technology operation, I learned more technical knowledge about the ways how to operate each online learning platform.*]

[Interviewee 2: *It is good to have an online group discussion. An online group discussion might build a sense of comfort and develop a community of learners. Through this group, I can also share my feelings about today's teaching and learning activities. In addition, it can encourage students to share information concerning the materials that they did not understand yet.*]

Conclusion

Overall speaking, the generated research findings of this current study lead to a tentative conclusion that online EFL learning enterprises are worthy suitable to be internalized in the upcoming ELT enterprises due to the practicality, feasibility, and applicability. To that end, those aforesaid benefits can potentially lead our modern EFL academicians to get closer to the target language outcomes attainment since they have progressively mastered complex technological tools, gradually transformed into more self-reliant knowledge discoverers, and managed their personalized learning activities well. For these holistic learning outcomes to fully take place, nowadays ELT experts, practitioners, policy-makers, and educators are concomitantly propelled to work hand-in-hand to better facilitate the future online EFL learning encounters in the presence of diverse learners. Linking with this suggestive advice, worldwide educational institutions may start to expose EFL teachers to conduct more intensive professional development training concerning the nature, approaches, and technicalities in internalizing online learning activities through their daily-based classroom circumstances.

Reversely, there were 2 major shortcomings unearthed in this present small-scale qualitative study. As this investigation solely relied on open-ended written narrative inquiry questions, it will be haphazard when we generalize those findings into the other online EFL learning contexts taking place in distinctive educational institutions. Lastly, since this present study gathered the data for a short period, a more longitudinal investigation is remarkably needed in the future to yield more robust research results appropriately applicable for the wider scope of online EFL learning implementations. Despite those all aforementioned limitations, this study can potentially provide more insightful views into a vast range of advantageous values of conducting online EFL learning dynamics amid the spreading of covid-19 pandemic during these 2 years, which in turn, giving a gently tap for educational stakeholders to begin inculcating a renewable perspective that online EFL learning activities can bring about plenty of meritorious values if applied in a well-planned manner.

References

Ahmad, J. (2016). Technology assisted language learning is a silver bullet for enhancing language competence and performance: A case study. *International Journal of Applied Linguistics and English Literature*, *5*(7), 118-131. http://dx.doi.org/10.7575/aiac.ijalel.v.5n.7p.118

Akhter, T. (2020). Problems and challenges faced by EFL students of Saudi Arabia during COVID-19 pandemic. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, *12*(5), 1-7. Retrieved from https://www.researchgate.net/

Allo, M. D. G. (2020). Is the online learning good in the midst of covid-19 Pandemic? The case of EFL learners. *Jurnal Sinestesia*, *10*(1), 1-10. Retrieved from https://www.sinestesia.pustaka.my.id/

Almusharraf, N., & Khahro, S. (2020). Students' satisfaction with online learning experiences during the covid-19 pandemic. *International Journal of Emerging Technologies in Learning (IJET)*, *15*(21), 246-267. Retrieved from https://www.learntechlib.org/

Anwar, I. W., & Wahid, J. H. (2021). Learners' perception on online learning implementation during covid-19 pandemic. *Journal of Languages and Language Teaching*, *9*(2), 126-138. https://doi.org/10.33394/jollt.v9i2.3576

Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2018). *Introduction to research in education*. Cengage Learning. Retrieved from https://books.google.co.id/

Atmojo, A. E. P., & Nugroho, A. (2020). EFL classes must go online! Teaching activities and challenges during covid-19 pandemic in Indonesia. *Register Journal*, *13*(1), 49-76. Retrieved from https://www.researchgate.net/

Efriana, L. (2021). Problems of online learning during Covid-19 pandemic in EFL classroom and the solution. *JELITA*, 38-47. Retrieved from https://jurnal.stkipmb.ac.id/

Farrah, M., & al-Bakry, G. H. (2020). Online learning for EFL students in Palestinian universities during corona pandemic: Advantages, challenges and solutions. *Indonesian Journal of Learning and Instruction*, *3*(2). https://doi.org/10.25134/ijli.v3i2.3677

Han, J., Geng, X., & Wang, Q. (2021). Sustainable development of university EFL learners' engagement, satisfaction, and self-efficacy in online learning environments: Chinese experiences. *Sustainability*, *13*(21), 11655. Retrieved from https://www.mdpi.com/

Hazaymeh, W. A. (2021). EFL students' perceptions of online distance learning for enhancing English language learning during covid-19 pandemic, 1-10. Retrieved from https://digitallibrary.aau.ac.ae/

Ho, S. C., Hsieh, S. W., Sun, P. C., & Chen, C. M. (2017). To activate English learning: Listen and speak in real life context with an AR featured u-learning system. *Journal of Educational Technology & Society*, *20*(2), 176-187. Retrieved from https://www.jstor.org/

Khatoony, S., & Nezhadmehr, M. (2020). EFL teachers' challenges in integration of technology for online classrooms during coronavirus (covid-19) pandemic in Iran. *AJELP: Asian Journal of English Language and Pedagogy*, *8*(2), 89-104. https://doi.org/10.37134/ajelp.vol8.2.7.2020

Mahyoob, M. (2020). Challenges of e-Learning during the covid-19 pandemic experienced by EFL learners. *Arab World English Journal (AWEJ)*, *11*(4). Retrieved from https://papers.ssrn.com/

Nartiningrum, N., & Nugroho, A. (2020). Online learning amidst global pandemic: EFL students' challenges, suggestions, and needed materials. *ENGLISH FRANCA: Academic Journal of English Language and Education*, *4*(2), 115-140. Retrieved from https://www.researchgate.net/

Nashruddin, N., Alam, F. A., & Tanasy, N. (2020). Perceptions of teacher and students on the use of e-mail as a medium in distance learning. *Berumpun: International Journal of Social, Politics, and Humanities*, *3*(2), 182-194. https://doi.org/10.33019/berumpun.v3i2.40

Ngo, D. H. (2021). Perceptions of EFL tertiary students towards the correlation between e-learning and learning engagement during the covid-19 pandemic. *International Journal of TESOL & Education*, *1*(3), 235-259. Retrieved from http://i-jte.org/

Octaberlina, L. R., & Muslimin, A. I. (2020). EFL Students perspective towards online learning barriers and alternatives using Moodle/Google Classroom during covid-19 pandemic. *International Journal of Higher Education*, *9*(6), 1-9. Retrieved from https://files.eric.ed.gov/

Oraif, I., & Elyas, T. (2021). The impact of COVID-19 on learning: Investigating EFL learners' engagement in online courses in Saudi Arabia. *Education Sciences*, *11*(3), 99. Retrieved from https://www.mdpi.com/

Pasaribu, T. A., & Dewi, N. (2021). Indonesian EFL students' voices on online learning during covid-19 through appraisal analysis. *LEARN Journal: Language Education and Acquisition Research Network*, *14*(1), 399-426. Retrieved from https://eric.ed.gov/

Rahayu, R. P., & Wirza, Y. (2020). Teachers' perception of online learning during pandemic covid-19. *Jurnal Penelitian Pendidikan*, *20*(3), 392-406. https://doi.org/10.17509/jpp.v20i3.29226

Rahmawati, F. (2016). E-Learning implementation: Its opportunities and drawbacks perceived by EFL students. *Journal of Foreign Languange Teaching and Learning*, *1*(1). Retrieved from https://core.ac.uk/

Rinekso, A. B., & Muslim, A. B. (2020). Synchronous online discussion: Teaching English in higher education amidst the covid-19 pandemic. *JEES (Journal of English Educators Society)*, *5*(2), 155-162.

Sahoo, S. (2020). E-readiness and perception of student teachers' towards online learning in the midst of covid-19 pandemic, 10-19. Retrieved from https://papers.ssrn.com/

Setyowati, L., Sukmawan, S., & El-Sulukkiyah, A. A. (2021). Learning from home during pandemic: A blended learning for reading to write activity in EFL setting. *JEES (Journal of English Educators Society)*, *6*(1), 9-17.

Syauqi, K., Munadi, S., & Triyono, M. B. (2020). Students' perceptions toward vocational education on online learning during the covid-19 pandemic. *International Journal of Evaluation and Research in Education*, *9*(4), 881-886. Retrieved from https://eric.ed.gov/

Tanjung, F. Z., & Utomo, A. (2021). Investigating EFL students' perception on online learning amidst covid-19 pandemic. *International Journal of Indonesian*

Education and Teaching (IJIET), *5*(1), 102-115. Retrieved from https://www.e-journal.usd.ac.id

Wahab, S., & Iskandar, M. (2020). Teacher's performance to maintain students' learning enthusiasm in the online learning condition. *JELITA*, *1*(2), 34-44. Retrieved from https://jurnal.stkipmb.ac.id/

Zou, B., Huang, L., Ma, W., & Qiu, Y. (2021). Evaluation of the effectiveness of EFL online teaching during the covid-19 pandemic. *SAGE Open*, *11*(4), 21582440211054491. https://doi.org/10.1177/21582440211054491

PREPARATION ASSISTANCE OF HOTS-BASED THEMATIC QUESTIONS FOR STUDENTS OF PRIMARY SCHOOL TEACHER EDUCATION (PGSD) PROGRAMME

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Abstract
Based on the results of the mid-semester exams of Primary School Teacher Education (PGSD) students class of 2019 (class 6B and 6C) of Sanata Dharma University, researcher get data if they still have difficulty in making HOTS-based thematic questions. Therefore, the researcher collaborated with 4th grade teacher of Santa Angela Elementary School Bandung (graduated from S2 Biology Education, Universitas Pendidikan Indonesia) to provide online assistance to students through high-end integrated learning courses (which is mastered by researcher). This research is a narrative research to describe (1) the strategy of preparing HOTS-based thematic questions in 4th grade Elementary Schools, (2) infographic analysis of HOTS-based thematic questions compiled by students, (3) the results of the trial of the infographic of these questions to 4th grade students of Santa Angela Elementary School Bandung.

Keywords: HOTS, narrative research, student mentoring

Introduction
One of the outputs of the high-end integrated learning lecture given to 6th semester PGSD students (class of 2019) at PGSD Sanata Dharma University is that they make Lesson Plan (RPP) for 4th or 5th grade Elementary Schools using a learning model that can help students think critically. For the midterm exam, PGSD students are asked to make a thematic lesson plan using a problem-based (PBL) or project-based (PjBL) learning model and contain Higher Order Thinking Skills (HOTS) based questions.

According to Lie, et al (2020, pp. 26-30) PBL, PjBL, inquiry, and discovery models can facilitate students to think critically. Therefore, PGSD students are asked to make lesson plan by applying the PBL or PjBL model so they can understand the peculiarities of the two models. PBL steps include training students to determine problems related to the subject and find solutions to overcome these problems (Jalmo, 2019, p. 81); while PjBL facilitates students to learn independently in solving problems and producing a certain project (Niswara, 2019, p. 88).

From lesson plans made by PGSD students in grades 6B and 6C, researcher found data: some PGSD students still have difficulty in making HOTS-based thematic evaluation questions. To overcome this, researcher collaborated with a class teacher from Santa Angela Elementary School Bandung to provide online assistance to PGSD students in the two classes. The teacher was chosen because (1) has a Master degree in education, (2) experience teaching in 4th grade Elementary School, (3) can test HOTS-based thematic questions made by PGSD students in the class.

Elementary School teachers candidat need to be skilled in creating learning and compiling HOTS-based thematic questions, because HOTS learning is intended to answer the education weakness problem in Indonesia. This is supported by the fact that indonesia's reading literacy achievement is 70% below the minimum competence, while the literacy ability of science and numeracy (mathematics) is 60% and 72% below the minimum competency (PISA, 2018, p. 2). This data was obtained from the results of The Programme for International Student Assessment (PISA) initiated by the Organisation for Economic Co-operation and Development (OECD), showing that the ability of Indonesian students is ranked 72 out of 77 countries (PISA, 2018, pp. 1-2). PISA (2018, p. 1) is a triennial survey since 2000 that aims to assess the extent to which 15-year-old students have gained enough knowledge and skills to fully participate in society. Indonesia has been participating in PISA since 2000, even though it is not part of the OECD countries. The question types tested by PISA are a combination of multiple choice and description that require learners to build their own responses. In other words, students must have reasoning ability, be able to evaluate and create in solving these problems. All points of the statement are arranged into groups, based on which part of the text is associated with contextual situations in society (PISA, 2018, p. 9). Due to the low reasoning ability of students in Indonesia for many years, the improvement of the educational quality starting from basic education has become a very important foundation. Test items were a mixture of multiple-choice questions and questions requiring students to construct their own responses. The items were organised into groups based on a passage of text describing a real-life situation.

In addition to PISA, another survey that can be considered in improving the quality of education is the Trends in International Mathematics and Science Study (TIMSS), sponsored by the International Association for the Evaluation of Educational Achievement (IEA). Since 1995, every 4 years TIMSS provides trend data on the achievement of numeracy and science of grade 4 and grade 8 students of the participating countries. TIMSS provides comparative data on the achievements of students of participating countries over time and in relation to the main variables of home, school, and classroom (Mullis, I. V. S., Martin, M. O., Foy P., Kelly, D. L., & Fishbein, B., 2019, p. 1).

Indonesia is one of the participating countries that participated TIMSS since1999 to 2015. From the results of the 2015 TIMSS study, Indonesia was ranked 44 out of 49 countries with an average score of 397 out of 500. This low achievement shows that the ability of Indonesian students is limited to recognizing a number of basic facts but have not been able to communicate, relate various topics, and apply the concept of numeracy (Hadi, S., & Novaliyosi, 2019, pp. 562-563S., & Novaliyosi, 2019, pp. 562-563). Hadi, S., & Novaliyosi (2019, p. 565) stated that the results of the TIMSS study can be used as evaluation to improve the

quality of education, because the results of the TIMSS study are valid in describing the quality of education of participating countries.

Based on the results of PISA and TIMSS research for several periods until now, it shows that the ability of Indonesian students has not met international standards, because the High Order Thingking Skill (HOTS) lags far behind compared to other countries (Hartini, Misri & Nursuprianah, 2018, p. 84). This is strengthened by several studies on science literacy such as those conducted by Rifqiayati (2013) on Biology students, Hadinugraha (2012) and Sophia (2013) on students of Bandung and Garut High School, Asma (2016) and Darmawan (2013) on Junior High School students, and Yuliati (2015) on Elementary School students; everything explains that the majority of Indonesian students are less able to develop analytical skills because they are not accustomed to doing so (Kencana, 2018, p. 34).

Mastery of literacy and critical thinking skills is needed in the era of the Industrial revolution 4.0 (Ghufron, 2018, p. 334). The indispensable literacy includes (1) technological literacy: students must be able to use technological applications or understand how machines and electronic devices work, (2) data literacy: students need to be accustomed to reading, analyzing and using information from the digital world and (3) human literacy: students are guided to become humanists, engage in organizations and work in a team. That is why every teacher should no longer do Lower Order Thinking (LOT)-based learning but use HOTS-based learning (Sani, 2019, p. 49). Teachers can at least apply problem-based learning (PBL) or project-based (PjBL) models, so that students have mastery of literacy and critical thinking.

HOTS-based learning has an impact on the teacher's ability to compose questions. The characteristics of the HOTS questions: (1) must measure higher-order thinking skills, (2) are based on contextual problems, and (3) use various forms of questions (Fanani, 2018, p. 57). Measuring high-level abilities means the types of questions formulated by the teacher are not so that students can repeat the answers as previously taught. Based on contextual problems means that the teacher gives questions in the form of narratives of actual problems in everyday life that have to do with the subject or concepts being discussed. Using various forms of questions means that teachers need to reflect on the questions issued by PISA which are oriented to higher-order thinking skills (Pangesti, 2018, p. 570). These skills train students to be able to conclude and synthesize the information obtained, and apply their knowledge in real life (Kurniawati & Rahmantika, 2021, p. 275). Marshall & Horton (2011, p. 93) state that HOTS can be said to be successful if students are involved with what they know in the learning process, are able to clearly differentiate ideas, argue well, solve problems, construct explanations, hypothesize and express complex things be easy to understand.

This study aims to describe (1) strategies for preparing HOTS-based thematic questions, (2) infographic analysis of HOTS-based thematic questions made by PGSD students, (3) test results of HOTS questions on 4th grade students of Santa Angela Elementary School Bandung.

Method

This research is a narrative research. According to Assjari & Permanarian (2010, p. 172), narrative research can be used by an educator to report their

experiences at work. The type of narrative research that the researcher chose was a scientific report on the results of assistance in the preparation of HOTS-based thematic questions to PGSD students (grades 6B and 6C) at Sanata Dharma University.

Strategy for Preparing HOTS Questions

HOTS was developed referring to Bloom's taxonomy which is the basis for higher order thinking (Rusminati & Styanada, 2020, p. 409). Teachers need to develop an implementation plan by formulating goals at levels C4 to C6 (analyzing, assessing/evaluating, creating/creating), implementing learning and evaluating learning by providing questions to measure students' higher-order thinking skills/HOTS (Qodra et al. al., 2021, p. 57).

HOTS questions are measurement instruments used to measure the ability of students not only to recall (recall), restate (restate), or refer without processing (recite). The steps for preparing HOTS-based questions that must be carried out by teachers are (1) analyzing Basic Competencies, (2) making question grids, (3) using problems related to everyday life, (4) compiling items, and (5) make scoring guidelines (Adimassana, et al., 2021, pp. 34.57).

Analyzing Basic Competencies, meaning that teachers choose Basic Competencies that can be made thematically-based HOTS questions. An explanation of the curriculum as a standard for a country, so that the preparation of questions must refer to the curriculum in order to avoid overlapping different levels.

Compile a questioning grid by mapping: (1) Thematic Basic Competencies that can be made HOTS questions, (2) selecting the main concepts related to the Basic Competencies to be tested, (3) formulating question indicators, and (4) determine their cognitive level. The cognitive level that needs to be used as a reference is the level of C4 (analyzing), C5 (assessing/evaluating), up to C6 (creating/creating).

Choosing contextual problems, the teacher chooses a stimulus related to events or information that motivates students to be interested in reading literacy questions related to metacognitive knowledge (Abduh & Istiqomah, 2021, p. 2073).

The contextual problems are arranged in the form of infographics that contain a case, discourse, scenario, visual or literacy text that has never been presented to students.

Writing questions according to the grid, the questions are written by the teacher according to the rules for writing HOTS items**.** The questions that are oriented to higher order thinking skills are: (1) Inferential questions: questions that can be answered by students after observing and assessing the subject provided by the teacher in the form of portraits, pictures, short writings, poems, news, and so on. This question aims to reveal what students understand after observing or reading subject from the teacher. (2) Interpretation questions: questions posed to students relate to incomplete information, and students must be able to provide an explanation**.** (3) Transfer questions: an attempt to broaden their horizons so that students can apply their knowledge. (4) Hypothetical questions: questions that encourage students to make predictions or forecasts of a problem they are facing (Ariyana et al., 2018, pp. 37-39).

Making scoring guidelines (rubrics) or answer keys is carried out by teachers based on educational evaluation standards (Ministry of Education and Culture, 2017, p. 17). The questions that are made are types of objective tests which can be in the form of multiple choice tests or complex multiple choice and subjective tests which are description questions (Zainuddin, 2021, pp. 66-67). These types of questions can also be used as instruments to explore or explore students' thinking skills: have they reached stages C4-C6 according to Bloom's revised taxonomy? (Umami, R., Rusdi, M. & Kamid, 2021, p. 66).

Based on these steps, the Santa Angela Elementary School teacher gave two examples of HOTS-based thematic questions for 4th grade (Table 1 dan 2). The goal is that PGSD students know the steps for preparing HOTS questions which must include three categories (1) transfer of information and knowledge, (2) critical thinking, and (3) problem solving (Mahanal, 2019, p. 52).

From Table 1, the teacher presents meaningful learning because it presents a non-fiction text about *Dracaena cinnabari* tree that grows on Socotra Island (Bahasa subject). Furthermore, students are invited to think critically to explore questions in the form of interpretation questions so that they can explain the eye process of seeing the Dracaena cinnabari tree (Science subject), so that they know the peculiarities of the tree.
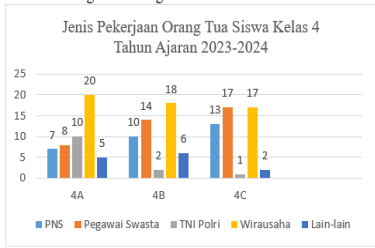
From Table 2, the teacher invites students to examine numeracy question about the types of parents works in a particular school, in the form of a bar chart (Mathematics subject) to practice numeracy skills. Furthermore, students are invited to think critically by observing the bar chart so they can interpret the percentage according to the question (PPKn subject/Pancasila and Civic Education subject).

Based on Tables, the form of questions that the teacher has presented are now turned into infographics. Furthermore, the researcher guided the PGSD students to make infographics about thematic questions based on HOTS for 4th grade Elementary Schools with the Basic Competencies that the researchers had determined.

Table 1. The first grid is HOTS-based thematic questions for Science and Bahasa

No	Mata Pelajaran	Materi	KD	Bentuk dan No Soal	Indikator	Soal	Jawaban dan skor
1.	IPA dan Bahasa Indonesia	Indra Penglihatan (tema 5 subtema 3)	3.6 Menerapkan sifat-sifat cahaya dan keterkaitan-nya dengan indera penglihatan (IPA) 3.4 Menggali pengetahuan baru yang terdapat pada teks nonfiksi (Bahasa Indonesia)	Uraian Nomor soal 1	Disajikan gambar dan informasi: peserta didik dapat menjelaskan proses mata melihat mulai dari 1) Cahaya pantul dari benda masuk mata 2) Ditangkap pupil (mengatur intensitas cahaya) 3) Ditangkap lensa mata (memfokuskan cahaya) 4) Retina (layar dan menggolongkan warna) 5) Saraf optik 6) Otak	1) Perhatikan gambar dan informasi berikut! Pada saat liburan Natal tahun 2030, Kirana dan adiknya yang bernama Yuki berlibur ke Socotra. Socotra merupakan salah satu kepulauan yang terletak di Samudera Hindia. Keunikan spesies pada pulau Socotra salah satunya adalah Pohon Darah Naga (Dragon Blood Trees) yang menjadi pemandangan utama ketika tiba di Pulau Socotra. Pohon dengan kanopi serupa payung terbalik ini memiliki nama ilmiah *Dracaena cinnabari* dan memiliki getah berwarna merah yang mirip darah. Pemandangannya sungguh menakjubkan, Yuki yang saat itu masih berusia 7 tahun bertanya kepada Kakaknya yang sudah SMP, **"Kak, taman ini sangat menarik dan pohon-pohonnya unik! Aku penasaran bagaimana cara mata kita melihat semua keindahan ini?"** Sumber: https://www.cnnindonesia.com/gaya-hidup/20200504160529-269-499906/pulau-alien-habitat-pohon-darah-naga-di-yaman Ayo bantu Kirana memberikan penjelasan kepada Yuki!	Peserta didik mampu menjawab 5-6 indikator = 10 Peserta didik mampu menjawab 3-4 indikator = 7 Peserta didik mampu menjawab 1-2 indikator = 4 Peserta didik hanya menjawab 1 indikator = 1

Table 2. The second grid is HOTS-based thematics questions for Pancasila and Civic Education with Mathematics

No	Mata Pelajaran	Materi	KD	Bentuk dan No Soal	Indikator	Soal	Jawaban dan skor
2	PPKN dan Matematika	Membaca diagram batang (tema 8 subtema 2)	3.3 Menjelaskan manfaat keberagaman karakteristik individu dalam kehidupan sehari-hari (PPKN) 3.5 Menjelaskan data diri peserta didik dan lingkungan-nya yang disajikan dalam bentuk diagram batang (Matematika)	Pilihan ganda kompleks Nomor soal 2	Disajikan diagram batang: peserta didik dapat menerjemah kan data pada diagram batang yang disajikan	2) Perhatikan diagram batang berikut! *Jenis Pekerjaan Orang Tua Siswa Kelas 4 Tahun Ajaran 2023-2024* (bar chart: 4A, 4B, 4C; PNS, Pegawai Swasta, TNI Polri, Wirausaha, Lain-lain) Berdasarkan diagram batang **Jenis Pekerjaan Orang Tua Siswa Kelas 4 Tahun Ajaran 2023-2024**, maka didapatkan informasi … . A. mayoritas orang tua kelas 4 Tahun Ajaran 2023-2024 yang bekerja sebagai pegawai swasta, yaitu 73,33% dari populasi B. perbandingan orang tua kelas 4 Tahun Ajaran 2023-2024 yang bekerja sebagai wirausahawan dengan PNS adalah 5:3 C. presentase orang tua kelas 4 Tahun Ajaran 2023-2024 yang bekerja sebagai TNI Polri sebanyak 42,67% dari populasi D. perbandingan orang tua kelas 4 Tahun Ajaran 2023-2024 yang bekerja sebagai PNS dengan wirausahawan adalah 6:11	Peserta didik menjawab AD =2 Peserta didik menjawab ABD/ACD = 1,5 Peserta didik menjawab AB/ AC/BD/CD = 1 Peserta didik menjawab ABDC = 1 Peserta didik menjawab ABC/BCD = 0,5 Peserta didik menjawab BC = 0

Infographic Analysis of HOTS-Based Thematic Questions by PGSD Students

Researchers asked PGSD students to create an infographic on HOTS-based thematic questions to:

1. Science subjects with Basic Competencies 3.8 understand the importance of efforts to balance and preserve natural resources in their environment, and Bahasa with Basic Competencies 3.5 outline personal opinions about the content of literary books (stories). Here is one example of an infographic about thematic questions made by PGSD students:

Figure 1. First infographic: Festival Susur Sungai (River Festival)

The infographic (Figure 1) was compiled by a female student named Ni Kadek Swandewi (191134088). From the infographic, science literacy is presented which deals with contextual problems about river pollution and how to overcome it. The science literacy is intended to be a cause and effect relationship if humans do not maintain the cleanliness of the river (Utama, Cahyo & Rahman, 2020, 253). The literacy text presented is in the form of a story "River Festival" (Bahasa subject), which aims to maintain the balance and preservation of the river as one of the natural resources (Science subject). Students read stories to be able to consider the most correct answer (C5 or assessing) of questions in the form of inferential questions.

2. Mathematics subjects with Basic Competencies: 3.2 explaining the various forms of fractions (ordinary, mixed, decimal, and percent) and the relationship between them, as well as Science subjects with Basic Competencies: 3.2 comparing the life cycles of several types of living beings and relating to their preservation efforts. Here is one example of infographic:

Figure 2. Second infographic: Sumatran elephant

The infographic (Figure 2) was compiled by a PGSD female student named Suci Salma Harum Situmorang (191134268). Infographics are structured to help students hone their numeracy skills by applying the concept of numbers and counting operations in everyday life. The type of question is interpretation questions, because students are asked to write answers in the form of interpretations (C5 or assessing) about the comparative concept of Sumatran elephant growth.

The Results of the Trial of The Application of HOTS-based Thematic Questions in 4th Grade Elementary Schools

A limited trial was conducted by teacher (researchers) to 27 4th grade students of Santa Angela Elementary School Bandung on June 9, 2022 (after Year-End Exams). Duration time for the students to fill 2 infrografic of HOTS-based thematic questions made by PGSD students was 20 minutes.

The results of the students' work for the Science literacy infographic "River Festival ": 25 students (92.6%) answered correctly and 2 students (7.4%) answered incorrectly. It is shown that in a relatively short period of time, the majority of students were able to read carefully as the result they answer correctly. The results of the students work for a numeracy infographic on the comparison of the weight of newborn elephants with the heaviest elephants: 20 students (74%) answered correctly because they were able to apply the concept of numbers and counting operations in the context of Sumatran elephant growth, while 7 students (26%) were unable to answer completely in a relatively short time.

Conclusion

The conclusion of the assistance carried out by researchers to help PGSD students (class 6B and 6C) class of 2019 Sanata Dharma University on the preparation of HOTS-based thematic questions are:

1. PGSD Students understand the strategy for preparing HOTS-based thematic questions for 4th grade Elementary School with the following stages:
    a) Must include three categories, namely the transfer of information and knowledge, critical thinking, and problem solving.
    b) Made based on Operational Verbs, to formulate question indicators that measure the analytical competence of students, the ability to evaluate and apply teaching materials in everyday life.
    c) Determine the type of question (multiple choice, complex multiple choice, fill in, true/false and description) and its scoring score.
    d) Arranged in the form of an infographic that contains a case, discourse, scenario, visual or literacy text that has never been presented to students, so they can think critically to solve the problem.
2. The majority of HOTS-based thematic questions chosen by PGSD students in their infographics are in the form of inferential and interpretation questions.
3. Limited trial results from the work of hots-based thematic question infographics by 27 4th grade students of Santa Angela Elementary School Bandung: within 20 minutes 92.6% of students were able to do science literacy and 74% were able to do numeracy.

PGSD students need to practice making HOTS-based thematic questions using transfer and hypothetical questions, in addition to inferential and interpretation. Trials of HOTS-based thematic questions to students need to take into account the time duration, especially for working on numeracy questions.

References

Abduh, M., & Istiqomah, A. (2021). Analisis muatan HOTS dan kecakapan abad 21 pada buku siswa kelas V tema ekosistem di sekolah dasar. *Jurnal BASICEDU 5*(4), 2069-2081. Retrieved from https://jbasic.org/index.php/basicedu.

Adimassana, Y. B., Sari, W. W., & Anugrahana, A. (2021). *Analisis pengembangan soal tematik berbasis HOTS di sekolah dasar*. Sukoharjo: Diomedia.

Ariyana, Y., et al. (2018). *Buku pegangan pembelajaran berorientasi pada keterampilan berpikir tingkat tinggi*. Jakarta: Direktorat jenderal guru dan tenaga kependidikan kementerian pendidikan dan kebudayaan.

Assjari, A., & Permanarian, P. (2010). Desain penelitian naratif. *Jurnal Asesmen dan Intervensi Anak Berkebutuhan Khusus. 10*(2), 172-183. Retrieved from https://doi.org/10.17509/jassi.v10i2.3922

Fanani, M. Z. (2018). Strategi pengembangan soal higher order thinking skill (HOTS) dalam kurikulum 2013. *Edudeena Journal of Islamic Religious Education, II*(1), 57-76. Retrieved from https://jurnal.iainkediri.ac.id/index.php/edudeena/article/view/582/455

Ghufron, M. A. (2018). Revolusi industri 4.0: Tantangan, peluang dan solusi bagi dunia pendidikan. *Seminar nasional dan diskusi panel hasil penelitian & pengabdian kepada masyarakat*, Jakarta 2 Agustus 2018, 332-337. Retrieved from http://www.proceeding.unindra.ac.id/index.php/dispanas2018/article/viewFile/73/45

Jalmo, T., Fitriyani, D., & Yolida, B. (2019). Penggunaan problem based learning untuk meningkatkan keterampilan kolaborasi dan berpikir tingkat tinggi. *Jurnal Bioterdidik, 7*(3), 77-87. Retrieved from http://jurnal.fkip.unila.ac.id/index.php/JBT/article/view/17480/12451

Kementrian Pendidikan dan Kebudayaan. (2017). *Modul penyusunan soal higher order thinking (HOTS)*. Jakarta: Direktorat Pembinaan SMA Ditjen Pendidikan Dasar dan Menengah.

Kencana, C. G. (2018). *Penerapan board game untuk menggali kemampuan literasi sains berdasarkan framework PISA dan respon siswa terhadap materi sistem pencernaan di SMA*. (Biology education master's thesis). Universitas Pendidikan Indonesia.

Kurniawati, R. P., & Rahmantika, F. (2021). Pelatihan pengembangan instrumen evaluasi berbasis HOTS untuk guru sekolah dasar. *Jurnal Altifani, 1* (4). 267-276. Retrieved from http://altifani.org/index.php/altifani/article/view/182/41

Lie, A., Tamah, S. M., Gozali, I., & Triwidayati, K. R. (2020). *Mengembangkan keterampilan berpikir tingkat tinggi*. Yogyakarta: Divisi buku digital PT Kanisius.

Mahanal, S. (2019). Asesmen keterampilan berpikir tingkat tinggi. *Jurnal Penelitian dan Pengkajian Ilmu Pendidikan:E-Saintika, 3*(2), 51-73. https://doi.org/10.36312/e-saintika.v3i2.128

Marshall, J. C., & Horton, R. M. (2011). The relationship of teacher facilitated inquiry-based instruction to student higher-order thinking. *School Science and Ma thematic, 111*(3), 93-101 Retrieved from: https://doi.org/10.1111/j.1949-8594.2010.00066.x

Niswara, R., Muhajir & Untari, M. F. A. (2019). Pengaruh model project based learning terhadap high order thinking skill. *Mimbar PGSD Undiksha, 7*(2), 85-90. Retrieved from https://ejournal.undiksha.ac.id/index.php/JJPGSD/article/view/17493/10513

Pangesti, F. T. P. (2018). Menumbuhkembangkan literasi numerasi pada pembelajaran tematik dengan soal HOTS. *Indonesian Digital Journal of Mathematic and Education 5* (9), 566-575.

PISA. (2018). *Country note: program for international students assessment (PISA).* Retrived from: http://www.oecd.org/pisa/publications/PISA2018_CN_IDN.pdf

Qodra, M., Laili, A., & Laihat, L. (2021). Keterampilan berpikir tingkat tinggi pada evaluasi pembelajaran tematik yang digunakan guru kelas IV di SD negeri 81 Palembang. *Jurnal Inovasi Sekolah Dasar 8*(1), 56-65. https://doi.org/10.36706/jisd.v8i1.1436

Rusminati, S. H. & Styanada, G. E. (2020). Analisis kemampuan menyelesaikan soal bangun ruang berbasis HOTS ditinjau dari kemampuan matematika siswa SD. *Jurnal Studi Guru dan Pembelajaran. 3*(3), 408-412. Retrieved from https://e-journal.my.id/jsgp/article/view/417

Sani, R. A. (2019). *Pembelajaran berbasis HOTS (higher order thinking skills).* Tangerang: Tsmart.

Mullis, I. V. S., Martin, M. O., Foy P., Kelly, D. L., & Fishbein, B. (2019*). TIMSS 2019 international result in mathematics and science*. United States: TIMSS & PIRLS International Study Center.

Hadi, S., & Novaliyosi, N. (2019). TIMSS Indonesia (Trends in international mathematics and science study). *Prosiding Seminar Nasional & Call For Papers*. Program Studi Magister Pendidikan Matematika Universitas Siliwangi, 562-569. https://jurnal.unsil.ac.id/index.php/sncp/article/viewFile/1096/754

Hartini, T., Misri, M. A., & Nursuprianah, I. (2018). Pemetaan HOTS siswa berdasarkan standar PISA dan TIMSS untuk meningkatkan mutu Pendidikan. *Eduma: Mathematics Education Learning and Teaching, 7*(1), 83-92.

Umami, R., Rusdi, M. & Kamid, K. (2021). Pengembangan instrumen tes untuk mengukur Higher Order Thinking Skills (HOTS) berorientasi Programme for International Student Asessment (PISA) pada peserta didik. *JP3M, 7*(1), 57-68. Retrieved from https://jurnal.unsil.ac.id/index.php/jp3m/article/view/UMA71/1651

Utama, C., & Rahman, A. F. (2020). Kaitan antara literasi sains dan HOTS untuk pembelajaran IPA di sekolah dasar. *Seminar nasional Pedidikan Dasar, 2*, 250-256. Retrieved from http://eproceedings.umpwr.ac.id/index.php/semnaspgsd/article/view/1389/1206

Zainuddin. (2021). *Pengembangan dan evaluasi pendidikan*. Lombok: CV. Alliv Renteng Mandiri.

USING ONLINE PEER REVIEW AS A STRATEGY TO IMPROVE WRITING SKILLS

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Abstract
This research investigated the use of online peer review as a strategy to improve writing skills in the revision process. This qualitative study will recruit two peers of a private university in Malang based on two criteria 1) they have passed an academic writing course with an excellent score, and 2) they were students who use online media to conduct peer reviews. Using a semi-structured interview, the students were asked what types of online resources they use for online peer review, and how they do peer review online. The interview data will be analyzed using content analysis to triangulate the data, investigator triangulation will be performed by involving two data analysts. The result of the study was students used WhatsApp and Zoom media to conduct online peer review, and students provide their writing in the form of an online file to the peer for review about grammar, writing effectiveness, and diction errors with several platforms, such as grammar checkers and online dictionaries to assist the revision process.

Keywords: online resources, peer reviews, revisions process, writing

Introduction

Writing has been widely thought of as the most difficult to master in English (Watcharapunyawong & Usaha, 2012). Writing proficiency necessitates several complex and diverse stages, requiring pupils to concentrate on "How to Come Up with Ideas, how to arrange them in a logical order, how to take advantage of discourse markers and rhetorical patterns to incorporate them cohesively within a written text, ways to modify text for greater clarity, how to alter text for proper grammar, and how to create a final product" (H. Douglas Brown; Heekyeong Lee, n.d.). Writing skills are very important and we should understand every mistake we make, but few are willing to be revised. Writing, according to Şen and Şimşek (n.d)., is the most problematic use of English in higher education. To help pupils understand the complexities of those writing processes, the use of online peer review as a strategy is then required to assist students in effectively completing each writing step.

Writing is recognized as a one-of-a-kind talent (Klimova, 2010). Writing, on the other hand, is a difficult and intricate process. They do not believe this for no reason. Writing skills necessitate more concentration; a piece may need to be rewritten several times before reaching the desired writing level Kellogg (2008)

because they must consider various components to make the writing intelligible. Furthermore, because they are aware that their work will be seen by others, student writers may put greater attention to early versions (Cho & Schunn, 2007). To help pupils understand the complexities of those writing processes, Long writing tasks should be divided into smaller components, and students should take feedback at all stages of the process (Baker, 2016). As a result, to aid university students in enhancing this skill, we must remember that what constitutes a standard language, what is appropriate and correct, and even the fundamental definitions of grammar are reliant on what has been described and codified in written language (Carter, 1995).

The writing process is very important to do to improve students' writing skills. This is also stated by (Graham et al., 2013), that writing can be used as a learning tool as well as to persuade others. Nowadays, writing is one of the most widely utilized modes of communication (Klimova, 2012). In the writing process, we must cultivate good writing habits for college students. According to best practice, long writing assignments should be broken down into smaller parts, and students should receive feedback throughout the process (Bean, n.d.). Students need feedback to be able to understand the mistakes they make. However, providing feedback can be laborious. Peer spend time commenting on technical writing issues, such as sentence structure, word selection, and organization. Such detailed work is time-consuming (Herrington & Cadman, 1991). In addition, students do not respond consistently to feedback and often express a feeling discouraged by comments (Jönsson, 2013). But, Writers will get a higher profit from writing feedback than those who don't receive it. This online peer review of students may be an attractive alternative to teacher feedback. Many kinds of the literature suggest that peer review should be part of the feedback process (Althauser & Darnall, 2001). Moreover, peer collaboration is effective in the following aspects Students who work alone are less likely to discover their misunderstandings Markman, (1979) and the contradiction between two very opposite things in the text (Otero & Kintsch, 1992). Researchers consistently state that the feedback process in writing will be able to improve the quality of students in final submissions by involving students (Jensen & Fischer, 2005). Writing researchers emphasize the use of feedback to modify and rewrite to improve writing skills (Schriver, 1989).

Formative feedback is an essential component of this writing process. It can be offered by the teacher or a peer in its application. On the other hand, 2020 provides strong evidence: COVID-19 requires schools and teachers to adapt, and ongoing cries for justice emphasize the need for more action, both online and offline, to provide equal possibilities for studying and learning. This gets us to the main point of our two reviews on this topic. Early feedback online resources such as WhatsApp and Zoom meetings as a feedback process and assisted by Google, online grammar checkers, and online dictionaries, were generally created with peer-centered goals in mind, such as making it simple to fix grammatical faults, Misspellings, language effectiveness, and data retrieval are all issues that must be addressed. This can aid in the support of more context-specific and student-centered concerns. The greater emphasis on formative instructor feedback—the use of comments rather than describing value to assist the process and growth as well as the advantages of giving the obvious benefit of peer review for reviewers

helps to emphasize the collaborative aspect of the writing process, which places a premium on student choice and experience. This review's specific emphasis on online is beneficial for many of today's partial or whole virtual writing courses. In online writing classes, as students negotiate their writing growth more frequently, formative input may become increasingly crucial. Formative feedback is critical for the growth of pupils' writing, particularly while compiling and revising (Anderson et al., n.d.). It will also require assistance, to instill confidence in students and people are encouraged as they reply and as well as receiving feedback, especially if they believe they are still growing as authors (Aull, 2020).

As reviewed above, most research is to enable learners to master the knowledge and skills that should be focused on before, during, and after writing. So far, it is still difficult to find research that reports the use of online peer-review strategies to improve writing skills. Then it becomes a huge challenge for researchers to respond to this challenge. And then conduct this current research, trying to how they should organize the text and knowledge; And what kind of plan, practice, and arrangement are crucial in the writing process. In this case, the following research questions are raised:
1. What types of online resources are university students used to conduct peer reviews?
2. How do University students do online peer reviews?

Method

Descriptive qualitative was the design in the current research, involving 2 peer groups at Malang Private University. Participants were assigned to answer interview questions and asked about their preference for writing skills and learning strategies. The interview question is used because the data collection process is carried out directly by the researcher himself, so in this case, the researcher is directly involved in the data collection process, including the observation and interview process.

This research was conducted at a small private comprehensive college at the university in Malang. Two peer groups were involved as respondents based on interview techniques that the researchers did through file-sharing via WhatsApp and conferences at zoom meetings to ask answers that were still lacking. These two groups are university students who have excellent scores and use online media to conduct peer reviews.

As a research tool, a set of six self-construction interview questions written in the participants' first language (Indonesian) was produced. This instrument has been translated into Indonesian, simplified, and suited to the subjects' language proficiency (Zuhairi & Umamah, 2016). In this question, we're asked to explore information about the online peer-review process carried out by participants to improve writing skills. The interview questions were checked and validated by an expert in English language teaching.

The data collection would ask participants to answer questions that have been made, which have been translated into Indonesian. The questions consist of three questions that would answer the research question, two questions as additional information that the researcher might need later, and one opening question to find out student responses about writing. Then give the participants some rules, indicating that they agree to participate in this research and are willing

to participate in some interviews, and continue in several ways. First, the online peer-review process is carefully structured in several ways. To start, students were asked to answer six questions that have been asked. This requirement allows instructors to blind each student's question. in this case, the instructor gives 30-35 minutes to answer questions and This interview was conducted three times to obtain consistent results from the participants. Students with a full concept would comment on the question. Second, the score is based on students' performance in peer review. The interview session was conducted via WhatsApp, then would clarify via Zoom to validate the data.

To triangulate the data, the researcher performed triangulation by involving two data analysts (the first author and a colleague). The data was analyzed using content analysis by the methods suggested by (Renz et al., 2018). Conducting content analysis involves the following procedures: (a)) Transcribing interview results to prepare data, (b) reading and examine the transcripts, (c) putting notes on transcripts to identify different categories of information, and (d) building the unit of analysis process through the use of themes that represent expressions of major concepts or an issue, (e) creating a coding scheme to completely arrange data, (f) every text must be coded, (g) obtaining inferences from coded data, and (h) analyzing and explaining the findings.

Findings and Discussion
Findings
Problem 1: What types of online resources are university students used to conduct peer reviews?

After performing several steps in this analysis: coding the data, organizing the data and themes, and identifying the data from the interviews, the interpretation is presented in the following section. In terms of the online resources they use to conduct online peer reviews, it was found that university students use the WhatsApp applications and zoom meetings to facilitate their online peer review activities.

> *"...I exchange the results of my answers with my friends with each other online usually via WhatsApp."* (student 2)
> *"...via WhatsApp and if it is not clear, then we do it via zoom…"* (student 1)

Not without reason, they use these two applications. This is because both have been widely used by many people and they can do online peer review through this application.

> *"...I use WhatsApp and Zoom… because they are not only simple to use, but they are also well known by many individuals, thus problems are unusual…"* (student 1)
> *"...I use these two applications since they are basic and straightforward to use... Zoom meetings are also extensively used during a pandemic like this, and for good reason. This is because the share screen button at the bottom allows me to easily share information about various chores and display the results of my writing…"* (student 2)

Problem 2: How do University students do online peer review?

In answering the second research question, interview analysis was carried out 3 times to ensure that their answers remained consistent and did not change. So that all the steps that researchers have taken have obtained fixed results. On the whole, student reviewers consistently conduct online peer reviews by sending their screenshots or files to be corrected via WhatsApp. This method is considered quite effective because it does not require energy to be able to meet directly with friends who are intended to conduct peer reviews.

> *"...to go online... I usually take screenshots of my text, sometimes I also send my files directly via WhatsApp..." (student 1)*

In addition, student 1 added that in the online peer review process, she used a zoom meeting if she felt that the results obtained were not clear. *"...and if it is not clear, then we do it via zoom..."*. After that, University students get feedback online related to the content written regarding grammar errors and related to the effectiveness of writing.

> *"Feedback from my friends after doing an online peer review they gave suggestions regarding the content I wrote by telling them about the use of grammar and also suggestions regarding the effectiveness of writing..." (student 1)*

> *"The feedback I get is advice regarding the grammar mistakes I wrote..." (student 2)*

In another feedback, it was found that student 2 got suggestions regarding diction errors that the readers did not understand. *".... they commented on the choice of words (diction) that I used to get more attention so that the writing would be effective and not cause misunderstandings to the readers..."*. To minimize writing errors, they make revisions to the writings that have received feedback from online peer review activities. Revisions are carried out by improving the content related to grammar, diction, and effective use of words with the help of applications (Google, online grammar checker, online dictionary).

> *"...I make revisions by improving my content by paying attention to the use of correct grammar and reducing words that are not needed in writing by using the application online grammar checker, google, and online dictionary....."* (student 1).
> *"..The revision that I did was correcting the diction and use online grammar checker, google, and online dictionary applications to correct sentence formation errors. ..."* (student 2).
> To deal with difficulties in the revision process, they need a long time to be able to make revisions properly and correctly. they reveal the time it takes between 20-35 minutes.

"...It took me 30-35 minutes in this situation." (Student 1) and
". I need 20-30 minutes." (student 2).

Discussion

Research has shown that peer review can help improve students' writing skills, and students can provide high-quality feedback. There is less research on the peer-review process. This research aims to contribute to this knowledge gap is reflected in two aspects. First, this research examines online resources for online peer review. These two research uncovered an online peer-review process conducted by university students.

The first finding of a semi-structured interview study revealed that the online resources used by university students to conduct online peer reviews are the WhatsApp application and also the Zoom meeting to get valid results. Peers will find it simpler to perform online evaluations and learn how to offer formative comments with the help of these two tools. The majority of student reviewers can give comments that identify the problem and provide solutions. The fact that the overall quality of student comments is fairly good and concentrated on topics of significance and the point is important since studies have shown that pupils gain equally, it is just as important to give feedback as it is to receive input (Nicol & Milligan, 2006).

Second, from the results of interviews conducted by researchers, most student reviewers can provide comments, point out the problem, and suggest how to solve the problem. Students receive feedback about their participation in the creative process based on the writing content displayed on the page; feedback is given in the comments section of the student page. The students also received feedback on their written products.

The quality of student feedback is it's usually quite high, and it's important to focus on questions of meaning and argument because studies have shown that, compared with receiving feedback, students benefit from providing feedback, even more. (Baker, 2016).

Interestingly, in this feedback process, digital resources such as word processing software, Google, online dictionaries, and online grammar checkers are also used to solve language problems such as grammar and mechanics in the revision process. This is important evidence that the integration of technology in writing classes provides promising benefits for students (Hughes et al., 2019). This is following the agreement findings from Yot-Domínguez and Marcelo, (2017) report that university students usually prefer to use social support. Throughout the writing process, technology can provide scaffolding and assistance. as We know, for example, that using a word processor can greatly improve revision and even increase students' enthusiasm for writing Morphy and Graham (2012), such as Google, online grammar checker, online dictionary.

In contrast, using online platforms to give feedback on students' writing process shows the real value of digital technology supports students' participation in the text-writing process. The difference between this online formative assessment practice and traditional paper-based teaching lies in its rich "instant and continuous feedback opportunities" (Gikandi et al., 2011). In addition, interview data show that using online space for evaluation can make them feel safe and at ease about the quality of writing and help them stay focused on their work. As a result, the focus of this study was on how peer review could improve students' writing processes. While specific outcomes were not evaluated in this

study, final articles as a whole were successful and indicative of a competent writing process.

Conclusion

Peer review, in essence, aids in the improvement of student performance on certain assignments. Online peer review, as an active engagement strategy, has the potential to boost students' writing skills during this COVID-19 pandemic, when face-to-face activities are extremely difficult to do. So, an online peer review can be carried out using WhatsApp as a file-sharing platform and Zoom meetings as a tool to show each other the results of assignments and confirm feedback findings that may not be easily comprehended. Furthermore, they can use various supporting technologies such as (Google, online grammar checker, and online dictionary) to help them modify the writing that has resulted from the feedback. Therefore, online peer review is needed to improve good writing skills.

Future research should continue to assess both the procedure and the outcomes to better understand how to conduct an effective online peer-review process. It would be beneficial to learn more about if and how student writers respond to feedback from their peers. One option would be to require students to make a statement describing how they used the comments they received in rewriting their papers.

References

Althauser, R., & Darnall, K. (2001). Enhancing Critical reading and writing through peer reviews: An exploration of assisted performance. *Teaching Sociology*, *29*(1), 23. https://doi.org/10.2307/1318780

Anderson, P., Anson, C. M., Gonyea, R. M., & Paine, C. (n.d.). The contributions of writing to learning and development: Results from a large-scale multi-institutional study. *Research in the Teaching of English, 50*(2), 199-235.

Aull, L. (2020). Student-centered assessment and online writing feedback: Technology in a time of crisis. *Assessing Writing*, *46*, 100483. https://doi.org/10.1016/j.asw.2020.100483

Baker, K. M. (2016). Peer review as a strategy for improving students' writing process. *Active Learning in Higher Education*, *17*(3), 179–192. https://doi.org/10.1177/1469787416654794

Bean, J. C. (n.d.). *Engaging Ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom (2nd ed.)*. 2.

Carter, R. (1995). *Keywords in language and literacy*. Routledge.

Cho, K., & Schunn, C. D. (2007). Scaffolded writing and rewriting in the discipline: A web-based reciprocal peer review system. *Computers & Education*, *48*(3), 409–426. https://doi.org/10.1016/j.compedu.2005.02.004

Gikandi, J. W., Morrow, D., & Davis, N. E. (2011). Online formative assessment in higher education: A review of the literature. *Computers & Education*, *57*(4), 2333–2351. https://doi.org/10.1016/j.compedu.2011.06.004

Graham, S., Gillespie, A., & McKeown, D. (2013). Writing: Importance, development, and instruction. *Reading and Writing*, *26*(1), 1–15. https://doi.org/10.1007/s11145-012-9395-2

Herrington, A. J., & Cadman, D. (1991). Peer review and revising in an anthropology course: Lessons for learning. *College Composition and Communication*, *42*(2), 184. https://doi.org/10.2307/358198

Hughes, M. D., Regan, K. S., & Evmenova, A. (2019). A computer-based graphic organizer with embedded self-regulated learning strategies to support student writing. *Intervention in School and Clinic*, *55*(1), 13–22. https://doi.org/10.1177/1053451219833026

Jensen, W., & Fischer, B. (2005). Teaching technical writing through student peer-evaluation. *Journal of Technical Writing and Communication*, *35*(1), 95–100. https://doi.org/10.2190/MBYG-AK7L-5CT7-54DU

Jönsson, A. (2013). Facilitating productive use of feedback in higher education. *Active Learning in Higher Education*, *14*, 63–76. https://doi.org/10.1177/1469787412467125

Kellogg, R. T. (2008). Training writing skills: A cognitive developmental perspective. *Journal of Writing Research*, *1*(1), 1–26. https://doi.org/10.17239/jowr-2008.01.01.1

Klimova, B. F. (2010). Formal written English revisited. *Procedia - Social and Behavioral Sciences*, *3*, 131–137. https://doi.org/10.1016/j.sbspro.2010.07.024

Klimova, B. F. (2012). The teaching of foreign languages. *Procedia - Social and Behavioral Sciences*, *31*, 202–206. https://doi.org/10.1016/j.sbspro.2011.12.042

Markman, E. M. (1979). Realizing that you don't understand: Elementary school children's awareness of inconsistencies. *Child Development*, *50*(3), 643. https://doi.org/10.2307/1128929

Morphy, P., & Graham, S. (2012). Word processing programs and weaker writers/readers: A meta-analysis of research findings. *Reading and Writing - READ WRIT*, *25*, 641–678. https://doi.org/10.1007/s11145-010-9292-5

Nicol, D., & Milligan, C. (2006). *Rethinking technology-supported assessment practices in relation to the seven principles of good feedback practice*. 14.

Otero, J., & Kintsch, W. (1992). Failures to detect contradictions in a text: What readers believe versus what they read. *Psychological Science*, *3*(4), 229–235.

Renz, S. M., Carrington, J. M., & Badger, T. A. (2018). Two strategies for qualitative content analysis: An intramethod approach to triangulation. *Qualitative Health Research*, *28*(5), 824–831. https://doi.org/10.1177/1049732317753586

Schriver, K. A. (1989). Evaluating text quality: The continuum from text-focused to reader-focused methods. *IEEE Transactions on Professional Communication*, *32*(4), 238–255. https://doi.org/10.1109/47.44536

Şen, N. S., & Şimşek, A. (n.d.). *An analysis of Turkish students' written errors: A case of an EFL context*. *4*(1), 11.

Brown, H. D. (n.d.). *Teaching by principles: An interactive approach to language pedagogy* (4th Ed.). Pearson Education.

Watcharapunyawong, S., & Usaha, S. (2012). Thai EFL students' writing errors in different text types: The interference of the first language. *English Language Teaching*, *6*(1), 67. https://doi.org/10.5539/elt.v6n1p67

Yot-Domínguez, C., & Marcelo, C. (2017). University students' self-regulated learning using digital technologies. *International Journal of Educational Technology in Higher Education*, *14*(1), 38. https://doi.org/10.1186/s41239-017-0076-8

Zuhairi, A., & Umamah, A. (2016). The Indonesian junior high school students' strategies in learning writing skill. *Arab World English Journal*, *7*(3), 385–393. https://doi.org/10.24093/awej/vol7no3.27

POVERTY AND STUDENTS' ACADEMIC ACHIEVEMENT IN PAPUA, INDONESIA

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Abstract
Poverty in Indonesia has experienced a continual decrease in the last decades. However, the numbers of people living under the poverty line in the country are still constant at above 10 percent. The study intended to review the influence of poverty on students' academic achievements in Papua. The study aims to explore the measurement of poverty, types of poverty, poverty and its effect in Papua, how poverty affects students' academic achievements, and possible recommendations. Some research studies have found how poverty negatively disturbs the students' academic achievements. The results indicate that poverty affects students' academic achievements in Papua and even leads them to school dropout. Becoming one of Indonesia's most impoverished regions with a high poverty rate, the academic achievement among students in Papua is highly correlated with poverty, health and safety issues, food security, parental behaviour, acute, chronic and stressor, and social and emotional challenges. Such situations later decrease their academic achievements in school.

Keywords: academic achievement, Papua, poverty

Introduction

Periodically, many people claim that educational score is not broadly due to teachers' contribution in teaching the students in the classroom. Instead, home environment and circumstances, especially poverty, plays a significant role. As a developing nation, poverty is a growing issue in Indonesia. The percentage of the Indonesian population living under the national poverty line is still high. Poverty imposes challenges for students in Indonesia, especially in Papua, such as accessing a better health facility, health family environment, nutrition, and even secure foods that result in their academic achievements. According to McKenzie, (2019) poverty is the major factor that contributes to student academic achievement all around the world. Some studies have found the correlation between children living in poverty and their low academic achievement. There are dozens of factors contributing to students' low academic achievement, but poverty is the most influential factor. Poverty plays a tremendous role in students' academic achievements in all the students' learning years (Kapur, 2018; McKenzie, 2019).

Furthermore, family outcomes, no matters high or low can directly create the environmental impact on the students learning. Children coming from a poor family have obstacles to learn as fast as their peers. Children learn vocabulary at their home, but vocabulary learned by students coming from high-income families are much more than students from low-income families. Then, the way students learn and comprehend are different from other students as their families may not assist them at home or they only have a single parent (Yawan, 2022). When parents do not have sufficient money, they have to work all the day for the children, which there will be no time for the parents to give their children assistance in doing their homework. Poverty provides numbers of challenges for children such as in accessing better health facilities, education, nutrition, secure foods, and employment one of the most important things is the stress that the children and their parents may have at home (Miller, Votruba-Drzal & Coley, 2019). These will give a direct impact on their grades because nobody wants to help them or even, care about their success in schools (Grinion, 1999; Unity et al., 2013; Fortner et al., 2021). Therefore, the main focus on the analysis of this study is to identify how poverty affects students' academic achievements in schools in Papua. In this case, the writers provide the research questions to be investigated in this study. 1) What is the current condition of poverty in Papua? 2) How does poverty affect students' academic achievement in Papua?

The study is organized into an introduction, methods and other topics including, measurement of poverty in Indonesia, poverty in Papua Indonesia and its effects, how poverty affects students' academic achievements, conclusion and recommendations.

Method

To gather and analyze the data, this research used synthesis research. This method of research is undertaken by synthesizing any relevant studies to make conclusions (Onwuegbuzie, Leach, & Collins (2011). In this research, therefore, the actual empirical research investigating the issues of poverty and academic achievement were carefully analyzed and synthesized to draw the links between poverty and students' academic achievements in Papua. The studies relating to the effects of poverty on academic achievements were collected from three main reliable sources that are ERIC Journal, Google Scholar and Scopus. To find relevant studies, the researchers employed the aid of Boolean operators such as AND, OR, and NOT to specify the focus of the search. Also, the specific keywords regarding the notions of Poverty, Papua, Indonesia, and Academic achievement were carefully used to collect relevant articles. Only peer-reviewed articles were listed. However, the researcher found limited studies regarding the issues of the poverty and academic achievement in Papua. Thus, to enrich the data, some online sources from online news, official ministry website, UNESCO website, UNICEF website were taken as secondary data to support this investigation.

Finding and Discussion

Measurement of Poverty in Indonesia

Poverty can be defined in either absolute or relative term. Absolute poverty is defined as minimum requirements needed in affording minimum foods standard, clothes, health care, and housing (Apergis, Polemis, & Soursou, 2022). They also

argue that sbsolute poverty has the same meaning with extreme poverty which is used to measure the main demands for survival utilised in developing nations or lacking a minimum standard of living that is utilised in rich nations (Apergis et al., 2022). Meanwhile, relative poverty is defined as the measurement of a family's income which is inadequate to meet the communities' standard of living (Oulhote & Grandjean, 2016). However, dozens of different approaches to measuring poverty have been used and presented. It frequently can be calculated by placing an applicable income poverty line at the level between roughly 40% and 70% of the domestic's median income (UNICEF, 2017).

There are various interpretations in classifying what human condition categorised as being in poverty. Such conditions also can be influenced by many aspects not only national standards of living, but also resources, and people perceptions of what is fundamentally acceptable. A family can be considered to be in poverty if the money earned by the family for 12 months is below the threshold number assigned the family according to its size (Andriaswati & Utami, 2022; Oulhote & Grandjean, 2016). They added that people are categorised as poor if they are not able to get access to what is commonly considered to be a reasonable standard and quality of life. Meanwhile, Yawan (2022) argues that people are categorised living in poverty when they could not participate in the activities and do not have good living conditions, unable to obtain the resources in the communities to which they belong. He added that people are in poverty when these resources are so dangerously below those administered by the average individual or family that they are affected and excluded from usual living conditions, customs and activities. Furthermore, according to Andriaswati & Utami, (2022) people are in poverty when they lack a standard or lack socially acceptable amount of money or material possessions and lack of satisfaction on their everyday basic needs.

As a developing country, Indonesia still struggles to fight poverty. Indonesia's economic growth ranging from 5.3% to 5.9 % since the year 2010 has assisted millions of Indonesians out of poverty. According to statistics of Indonesia (2017), approximately 28 million of Indonesians were still living under the national poverty line. It is important to note that the measurement of poverty is different across countries. According to the World Bank, one of the measurements or indicators of poverty is the income measure. In Indonesia, poverty is generally associated with the percentage of the Indonesian population living on less than USD $2 a day (Statistics of Indonesia, 2016). In other words, the government of Indonesia determined the poverty line at a monthly per capita income is IDR 354,386 or just a little over USD $25 per month. If the government applied the international poverty line of not less $2 a day, then 40% of Indonesian would be categorised as poor. One of the factors that contribute to poverty in Indonesia is the income gap (Jakarta post, 2016). The reality nowadays shows the income gap has widened between Indonesian families. According to Jakarta post (2016), ten percent of wealthier in Indonesia own roughly 77 percent of the country wealth in which 40 percent of them live and originate from Java Island.

Papua that lies in the eastern part of the Indonesia archipelago has international recognition as one of the resource-richest places in Asia. However, while most of the Indonesian population live in Java and Sumatera Island, poverty in this region is still inevitable. With some difficulties in access and a huge part of remote and isolated areas, Papua comes with the highest percentage of its

population living below poverty. According to Statistics of Indonesia (2016), the eastern part of Indonesia (Papua) shows the worst numbers of Indonesia with high-rate of poverty if compared to other regions in Indonesia such as Java Island, Sumatera or Kalimantan (Borneo) with nearly 30% of its population is in poverty which is even much higher than the national level. The role of infrastructure development, divers of inequality and unequal opportunity, and lack of protection in Papua are some factors that seem to contribute to the high rate of poverty (Andriaswati & Utami, 2022; Susanto & Wulandari, 2021).

Poverty in Papua and Its Effects

Poverty has become a growing issue in Indonesia especially in the eastern part of Indonesia. According to Hasibuan, Hariani, & Pratiwi, (2021) a number of Papuan people living in poverty are the highest if compared to other regions in the country. Also, the percentage of children live in poverty is higher than children live in a wealthier family. We all know that there is a strong relationship between poverty and the academic achievements of students. A study conducted by Bergeson (20016) found that 43.5% of students who live in poverty were unable to successfully score based on required subject area assessments and only 13.2% of students who are coming from low-income families scored based on the required subject area assessments. Another study in China, conducted by Xiao (2012) measured the children achievement in school and their family incomes. The result of the study showed that numbers of chosen children with high family incomes performed much better than students from low family incomes (Zhang, 2012). Students who live in poverty continually score below norms regardless of ethnicity or race (Bergeson, 2016). Poverty can create a huge effect on achievement despite the fact that it is a hard identifiable variable as it involves with social status (Hasibuan et al; Welch, 2013).

Another effect of children coming from a low socioeconomic status is they experience high rates of school dropout (Bergeson, 2016). In 2012, over 44.3 children lived in poverty and roughly 2.5 million children in Indonesia aged between 7 to 15 years old were drop out of schools due to economic and inequality problems (UNICEF, 2012). Brownfield, Thielking, Bates & Morrison (2020) argue that financial difficulties were the major issue for lack of success in education among the children. For example, a student named Teo from Papua was interviewed by an Education Specialist for UNICEF in 2016 about the reason why he was dropped out of school. A nine-year-old Teo simply answered that he rarely went to school because his parents were very poor, so he had to work to help his family for a living. A recent survey in 2016 showed that in Papua alone, there were over 50 percent children drop out from schools and approximately 50% of them were students from secondary schools in Papua (UNICEF Indonesia, 2016). Many students also do not successfully meet the subject's requirement or performed below average especially in the exam. As a result, approximately 30% of students in Papua were unable to finish their secondary schools (UNICEF, 2012).

There are some factors that contribute to a high-poverty rate in Papua and one of the major issues is social inequality among various regions in Indonesia. Most of the investments and budget development in Indonesia are highly concentrated on Java Island which causing rising inequality between Java and the outer islands known as Jawa-Sentries (Indonesian language). Inequality distribution can keep

people in Papua from accessing the tools, basic social services and resources in supporting their needs. A number of districts, sub-districts, and villages are geographically isolated, especially for those who are living in the highlands and mountains. They lack access to healthcare, clean water, sanitary environments, foods security and even education. According to Statistics of Indonesia (2016), in Java Island especially in the Greater Jakarta and Surabaya, contribute approximately 60 percent to the total Indonesian economy. Moreover, a World Bank in 2015 informed that there are 80 percent of Indonesia's population (where more than a half are from eastern Indonesia), could not have the benefit of fruits in the last ten years which means that 200 million Indonesian population are still left behind.

Despite the fact that some scholars keep debating whether the correlation between poverty and students' achievements are ethically strong or causal, the relation between poverty and academic achievement is strong and consistent (Miller, Votruba-Drzal, & Coley, 2019). Therefore, poverty is a global phenomenon, and widespread of this social phenomenon happens in Papua which is also inevitable. A large body of research has reported the various impacts of poverty on children health, cognition, socio-emotional, functioning, and academic achievement (Miller et al., 2019; Purwono et al., 2021). Poverty in Papua, Indonesia, cannot just be defined as insufficiency of welfares instead poverty in Papua is very complex and involves insufficient outcomes such as health and safety issues, bad environments, emotional and social challenges, foods insecurity and acute and chronic stressor (Grainger, 2014).

How Poverty Affects Students' Academic Achievements

The following are some risk factors of poverty that has an impact on the secondary students' academic achievement in Papua, Indonesia.

Health and safety issues in Papua

Family living in poverty is directly associated with child development where poverty can seriously damage health problems for children. They frequently become subject to insufficient health care, environmental risks, and even poor nutrition. In Indonesia, especially Papua, many children still suffer from lack access to clean water and proper sanitation, breastfeeding practices, and general nutritional condition (UNICEF, 2012). Thus, such conditions make school-aged children (7-12 years old) vulnerable to asthma, flu, cough and fever, as well as diarrhoea. Research was showing that the status of poverty on the children was linked with the high number of children's school absences and illness as a consequence of health and safety issues. Miller et al., (2019 talked about the effect poverty on children health issues which cause the delays in children's language development and children often are not covered by health insurance. He added that in America for instance, children are unable to attend 21 million days of school every year due to inadequate health care and asthma, and those children are from low-socioeconomic backgrounds.

Children living in poverty have commonly physical health problems than children from high- income families. There is a greater incidence of such situation as asthma, the infection of tuberculosis, respiratory disease, obesity and even hearing loss (McKenzie, 2019). According to UNICEF (2017), there are 26

provinces out of 33 provinces in Indonesia with a high rate of health and nutrition problem, and Papua is on the list even in the top five. Although the Indonesian government has made several important attainments in reducing the rate of health problems on children, however, the reduction is not evenly administered across the regions. Indeed, the evidence showed that in Papua, these diseases mainly occur on children from poor income households both in rural and urban areas. This can absolutely affect the children learning outcomes due to health and safety issues. Indeed, children who live in poverty are more likely to get poor health and be susceptible to illness and hunger. They also have worst cognitive developments if compared to children who are not living in poverty which make them unable to participate in school activities.

Family's environment

Family's environment certainly contributes to their children academic achievement especially those who live in poverty (Garrett et al., 2016). Some families and communities with low-income, do not pay attention much to the importance of education. They mainly do not notice the value of formal education for their children. As a consequence, this makes the children becoming unprepared with the schools' situation and the environment. Moreover, a family who is in poverty status are not well-educated which make their children are not adequately served. This is how it looks in Papua. Many parents in Papua are unable to finish their secondary schools and even have no schooling. They are mostly illiterate, so they do not have a deeper understanding of what sort of educations needed by their children. According to UNICEF Indonesia (2012), Papua needs a crucial attention the region has the lowest percentage of parents enrolled at both junior and high secondary levels. Some studies have shown that well-educated families have a much easier time to get their children more prepared for school than families with no educational background (Tripp, 2011; Lacour & Tissington, 2011). There is a correlation of parents' level of education to their children academic achievements. Parents with high education levels can assist their children in school work activities and can ensure children's enthusiasm in their studies (Yawan, 2022).

Despite the education level of their parents, the children in Papua also are expected to work in the fields during harvest time. Indonesia has some four million children engaged in child labour with approximately 30 percent are children from eastern Indonesia, Papua. They have to work six to seven hours a day to meet their basic needs/foods. Children who spend their time by working may lose part of their learning time. This seriously affects their academic achievement (Sofilda, Hamzah & Sholeh, 2014). Almost two-thirds of out-of-school children ageing 10-14 years old are engaged in some productive activity (Keamey, 2017). Since they are born with in farming and agriculture-based communities, farming and hunting is their primary livelihood. They are working all the time to provide income for their families. In the harvest time, the children are not going to school instead parents are using their children as a mean of labour by helping them with the work in the farming in order to provide additional income for the families. They mainly work for 1 to 3 months during the harvest time. Children who spend most of their time on working potentially have roughly 30 percent lower possibility to attend school than children who do not (UNICEF Indonesia, 2017).

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Emotional and Social Challenges

Many children who live in poverty, emotionally and socially are unstable. Children need healthier learning and exploration to shape their emotional and brain development in order to work optimally. Unfortunately, poor families are likely to be a greater predominance of such unfavorable conditions as teen motherhood, depression and inadequate health care which results the decrease of sensitivity toward the children and later poor school achievement on the child's part (Yawan, 2022, McKenzie, 2019). This means that children who raised in poverty are more likely to experience depressive symptom which lasting on their academic competence in the school.

Strong, and secured parents at home can assist to shape the children's development regarding their behaviour and social skills. Children growing up in such situation are more likely, on average, to experience a healthy learning environment and appropriate emotional every day interactions. For instance, children growing up with emotional dysregulation are more likely to get a range of negative outcomes such as frustration, and later they become easily to give up on assignments when they just one step away to finish it. Such condition will interrupt students' social skill to dependently work with certain communities or groups, and lead them to be excluded by the community members who believe that they are not even "making any contributions" or "pulling their share of load". This rejection and the attendant decrease in cooperation and exchange some pieces of information causing it to become worse. Then, the children are placed at risk that they are already shaky academic achievement (McKenzie, (2019).

Food Insecurity

Food insecurity is absolutely a threat to students' success in school and potentially affects their academic achievement. Family living in poverty mainly has to sacrifice stock of foods that they have and restrict the frequency of meals due to food insecurity. According to Ginting et al., (2020) food insecurity simply is a situation in which a family has insufficient access to healthy nutritious foods. The fact that the majority of children in Papua region do not have access to sufficient and healthy foods and the food available in the region is limited. That is why Papua under the government of Indonesia, is categorised as the most vulnerable region in the country with high rate of food insecurity due to poverty (Ginting et al., 2020). Limited access to foods in Papua is due to poverty such as low incomes, unstable of employment and limited purchasing (World Food Program, 2013). It is also reported that there is approximately 28 percent of children are stunting (growth) and 16 percent of them are under-weight due to food insecurity or poor nutrition. Furthermore, the local government reported that there are approximately 23% of the population in Papua are not able to satisfy their energy needs for 2,100 calories a day.

A study conducted in the USA found that 14.5 percent of households experiencing food insecurity have a greater impact on their children college attendance (USDA, 2013). Food insecurity can impact negatively both secondary and high schools' students' outcomes (Paschall, Gershoff, & Kuhfeld, 2018). As a consequence, children who are food insecure along their lifespan are likely to attend schools or colleges in fewer numbers than children who are not. Indeed, food insecurity determines students' academic achievements or success in both

elementary and secondary schools as some researchers have pointed out that students who live with food insecurity are frequently unable to achieve at same score as their peers who live with food secure (Paschall et al., 2018).

Acute and Chronic Stressor

Stress can be defined as the physiological perception of pressure, and the body responds which resulting from an adverse situation. Having stress can be beneficial for people as it improves our immune system and develops resiliency to function optimally. Nevertheless, acute and chronic stress that students living in poverty have may cause a devastating effect on their life. Acute stress is a psychological condition that refers to anxiety or behavioural disturbances resulting exposure to trauma or violence. Meanwhile, chronic stress is a high stress for an extended time. Children living in poverty become more subject to acute and chronic stress than their affluent peers; they are more likely to experience a significance chronic stress than children with high- socio-economic status (McKenzie, (2019). Children in Papua who live in poverty frequently experience disruptive or traumatic events as a result of negative parenting. According to WFO Papua, stunting prevalence (or chronic) among children in Papua is 28% while wasting (acute) is high, approximately 13.8% (Riskesdas 2010). The level of family income of children is positively linked with good parenting which some studies found can increase the academic achievement of children (McKenzie, (2019). Children living in poverty in Papua, are commonly neglected by their family as their parents spend most of their time by working and hunting. Parents do not have time and energy for their children who later impair children psychological and emotional development.

Conclusion

Poverty creates numbers of negative effects on children academic achievements. It also may significantly affect the children academic achievement in Papua Indonesia. Children living in poor families are more likely to experience some potential problems in schools than children who grow up in middle or upper-class families. With a number of students experiencing school drop-outs in Papua means that the main reason for being unable to finish their studies are low academic achievements as a result of poverty its self. As the poorest region in the country, it is difficult for families in Papua to escape from poverty and their children become the victim of such situation. Poverty puts the children at a greater risk which impair the resources that they have such as emotional, mental, health and brain development which later affect their academic success. In other words, a problem brought by poverty creates another, which after that contributes to another one, resulting in apparently not stopping effects.

While social environment, health and safety issues, foods insecurity, acute and chronic stressors are the risks factors of poverty that affects children academic achievements and in light of the aforementioned conclusions. The study recommends that the government of Indonesia have to focus on the development of new economic growth centres not only Java island, but also the outer islands especially Papua in order to reduce inequality (structurally) among the various regions. The government also should combat the poverty by reducing income distribution inequality among regions. In addition, the government of Indonesia need to subsidise free basic healthcare or expand the infrastructure by providing

more hospitals, health centres and nursing homes in the region with high rate of poverty. Healthy lifestyles is expected may lead to higher incomes. Morover, providing social protection for those who are living under poverty line as it is a core part of development policy to fight poverty and improve equity. At family levels, parents should spend their time 10 to 20 hours every week to build up emotional relationship and interactions with their children. The also should provide a strong consistency, reliability, and unconditional guidance, affection, love and support for their children.

References

Andriaswati, E., & Utami, S. (2022). Determinants of poverty rates in Papua province in 2011-2019. *Efficient: Indonesian Journal of Development Economics*, *5*(1), 1453-1467.

Apergis, N., Polemis, M., & Soursou, S. E. (2022). Energy poverty and education: Fresh evidence from a panel of developing countries. *Energy Economics*, *106*, 105430.

Badan Pusat Statistik [Central Bureau of Statistics], (2016). *Persentase angka kemiskinan menurut kelompok umur, 2011-2016.* Retrieved from https://www.bps.go.id/linkTableDinamis/view/id/1056

Brownfield, N. R., Thielking, M., Bates, G., & Morrison, F. (2020). Does poverty impact student academic outcomes and wellbeing in Australian universities? A systematic review. *Journal of Social Inclusion*, *11*(2), 4-19.

Fortner, K. M., Lalas, J., & Strikwerda, H. (2021). Embracing asset-based school leadership dispositions in advancing true equity and academic achievement for students living in poverty. *Journal of Leadership, Equity, and Research*, *7*(1), n1.

Garrett-Peters, P. T., Mokrova, I., Vernon-Feagans, L., Willoughby, M., Pan, Y., & Investigators, F. L. P. K. (2016). The role of household chaos in understanding relations between early poverty and children's academic achievement. *Early childhood research quarterly*, *37*, 16-25.

Ginting, T. A. B., Sudibia, I. K., Dewi, N. P. M., & Marhaeni, A. A. I. N. (2020). The effect of education and dependency ratio on economic growth and poverty in Papua. *American Journal of Humanities and Social Sciences Research (AJHSSR)*, *4*(6), 186-195.

Grainger, S. (2014, April 14). *UNICEF Indonesia: Remote schools: Inspiring Papua's children to go the extra mile for education* [Web log post]. Retrieved from http://unicefindonesia.blogspot.com.au/2014/04/remote-schools-inspiring-papuas.html

Grinion, P. E. (1999). *Academic achievement and poverty closing the achievement gap between rich and poor high school students* (9921413) (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (9921413).

Hasibuan, L. S., Hariani, P., & Pratiwi, A. S. (2021). Poverty development post fiscal decentralization policy in Otsus fund receiving province in Indonesia (Case study: Province of Papua, West Papua, and Aceh). *International Journal of Economic, Technology and Social Sciences (Injects)*, *2*(2), 562-574.

Kapur, R. (2018). Factors influencing the students academic performance in secondary schools in India. *University of Delhi*, 575-587.

Keamey, A. (2017). *Laporan tahunan Indonesia 2017.* Retrieved from http://www.unicef.org/Indonesia

Lacour, M., & Tissington, L. D. (2011). The effects of poverty on academic achievement. *Educational Research and Reviews, 6*(7), 522-527.

McKenzie, K. (2019). The effects of poverty on academic achievement. *BU Journal of Graduate Studies in Education*, *11*(2), 21-26.

Miller, P., Votruba-Drzal, E., & Coley, R. L. (2019). Poverty and academic achievement across the urban to rural landscape: Associations with community resources and stressors. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, *5*(2), 106-122.

Oulhote, Y., & Grandjean, P. (2016). Association between child poverty and academic achievement. *JAMA pediatrics*, *170*(2), 179-180.

Onwuegbuzie, A. J., Leach, N. J., & Collins, K. M. (2011). *Innovative qualitative data collection techniques for conducting literature reviews/research syntheses.* The SAGE handbook of innovation in social research methods. Thousand Oaks: Sage,182- 204

Paschall, K. W., Gershoff, E. T., & Kuhfeld, M. (2018). A two-decade examination of historical race/ethnicity disparities in academic achievement by poverty status. *Journal of Youth and Adolescence*, *47*(6), 1164-1177.

Purwono, R., Wardana, W. W., Haryanto, T., & Mubin, M. K. (2021). Poverty dynamics in Indonesia: Empirical evidence from three main approaches. *World Development Perspectives*, *23*, 100346.

Susanto, D., & Wulandari, T. S. (2021). Multidimensional poverty: Identification of deprivation characteristics of Papua's population poverty in 2020. *The Indonesian Journal of Planning and Development*, *6*(2).

Sofilda, E., Hamzah, M. Z., & Sholeh, A. S. (2014). *Human development and poverty in Papua province (An Analysis of Simultaneous Approach on Panel Data Regression).* Retrieved from https://ssrn.com/abstract=2382080

Tripp, D. J. (2011). *A study of the effect of positive behavior interventions and support on student behaviors and academic achievement in high-poverty schools* (3478370) (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (3478370)

Unity, O., Osagiobare, O. E., & Edith, O. (2013). The influence of poverty on students beahaviour and academic achievement. *Education Research International, 2*(1), 151- 160.

Yawan, H. (2022). Yo Si Puedo: A cuban literacy program to strengthen literacy level in West Papua. *IJIET (International Journal of Indonesian Education and Teaching)*, *6*(1), 82-92.

WFO Indonesia: Papua Profile. (2013, January). Retrieved from wfp.org/countries/Indonesia WFP. (n.d.). Encyclopedia of Public Health, 1458-1458. doi:10.1007/978-1-4020-5614-7_3737

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