

HUMAN BEHAVIOR, DEVELOPMENT and SOCIETY

Volume 21 No. 1, January – March 2020 | ISSN 2651-1762



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Human Behavior, Development and Society, Journal of the Institute for Interdisciplinary Studies,
Asia-Pacific International University
Online ISSN 2651-1762

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Human Behavior, Development and Society is a refereed multidisciplinary journal that explores a wide range of scholarly topics, especially in fields relating to the humanities and social sciences. It is published online three times a year and is available free of charge through the ThaiJo and Asia-Pacific International University (AIU) websites, with a limited number of hard copies available. The journal, originally entitled *Catalyst*, has been published since 2006 by Asia-Pacific International University, Muak Lek, Thailand, through its publishing arm *Institute Press*.

The journal has the following objectives:

- a). To stimulate the creation and synthesis of beneficial information, as well as its broad dissemination, especially in the varied fields of the humanities and social sciences,
- b). To foster a deeper understanding regarding the impact of business policies and practices on society, and
- c). To promote the adoption of best practices in communities through education, and to aid in the resolution of community issues for the betterment of society; this represents the development aspect referred to in its name.

Editorial Objectives

The editorial objectives are to advance knowledge through use of classical – or the creation of innovative – methods of investigation, and to foster the examination of cross-cultural issues to increase mutual understandings among diverse social groups. Encouraging cooperative studies and scholarly exchange across borders, as well as within Thailand, remains one of its aims. The application of theoretical considerations to the field, business, or community situations is also an outcome that is sought.

Journal Positioning

The journal is broadly based and has the potential to impact thinking and practices across a range of subject areas, dealing with substantive issues that arise in both developing and developed countries. It will likely appeal to readers with a broad appreciation of the social issues facing organizations, communities, and governments operating under varied challenges and constraints. Its contents are meant to appeal to both the academic community and practitioners in numerous areas of interest.

The positioning of the journal means that a variety of topics is covered in most issues. These, in turn, differ in their philosophical content, academic appeal, and practical implications.

Appropriate Content

The journal covers a broad spectrum of topics. These include, but are not limited to, anthropology, allied health focused on community issues and health education, education from the primary to the tertiary levels, literature, language use and acquisition, business, management, finance, geography, psychology, social sciences, philosophy, and theology. Review essays and seminar/forum papers are also accepted when appropriately focused. Well-executed studies that address interesting and significant topics in the areas mentioned above are particularly welcomed. All articles accepted should make significant contributions to understanding and add to the corpus of knowledge in their respective fields.

The following constitutes a partial list of topics that are considered potentially suitable for publication:

1. Applied linguistic or linguistic studies that examine issues related to communication, language pedagogy and use, as well as theories and meaning of language.
2. Religious or biblical studies that explore historical, philosophical, sociological, as well as hermeneutical issues.
3. Anthropological or ethnographic studies which seek to reflect cultural nuances of communities for a better understanding of the society.
4. Cultural/intercultural issues and diversity, including how tensions involving these parameters might be handled to achieve social justice and acceptance.
5. Review articles or studies in the fields of marketing, business, stock market trading, and auditing practices, and their significance to the business and broader community.
6. Organizational behavior, resilience, and the creation of a positive psychological work environment and job satisfaction.
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Human Behavior, Development and Society is published four times per year by Institute Press during the months of March, June, September and December.

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Indexing

Thai-Journal Citation Index Centre (TCI)

EBSCO Information Services

Current and Past Issues

Volume 21 No 1 March 2020

Volume 20 No 4 December 2019

Volume 20 No 3 September 2019

Volume 20 No 2 June 2019

Volume 20 No 1 March 2019

Volume 19 December 2018

Volume 18 August 2018

Volume 17 April 2018

Volume 16 December 2017

Volume 15 June 2017

Volume 14 December 2016

Volume 13 June 2016

Volume 12 December 2015

Volume 11 June 2015

Volume 10 December 2014

Volume 9 July 2014

Volume 8 December 2013

Volume 7 December 2012

Volume 6 December 2011

Volume 5 December 2010

Volume 4 November 2009

Volume 3 November 2008

Volume 2 November 2007

Volume 1 November 2006

From the Editor

Human Behavior, Development and Society (HBDS) is an interdisciplinary peer-reviewed journal of Asia-Pacific International University (AIU). *HBDS* aims to publish findings and discussions in all aspects of human behavior, development and society. The journal's scope includes advancing knowledge through the use of classical methods of investigation, and fostering examination of cross-cultural issues to increase mutual understanding among diverse social groups in the international community. The journal continues to be indexed in EBSCO and – beginning with this issue – in TCI Tier 2. It strives to maintain rigorous peer-reviewed standards and the highest level of ethical integrity, ensuring consistency and scientific rigor in each of its research articles.

This is the first issue of *HBDS* for 2020. In addition, it is a special issue dedicated to papers presented at the 7th International Scholars Conference, which is an annual research event co-hosted by four Adventist higher educational institutions located in Southeast Asia: Asia-Pacific International University, Thailand; Adventist University of the Philippines; Universitas Advent Indonesia; and Universitas Klabat, Indonesia. Thus, these articles were recently presented at this conference, which was most recently hosted by Universitas Advent Indonesia in October 2019. In this issue of *HBDS*, we are pleased to present 10 articles submitted by various researchers. Six articles were submitted by researchers external to the university, and four articles were submitted by internal researchers. We are delighted to see reports and findings from various content areas, including business, education, health education, science education, and religion. The majority of the articles in this issue reflect interests from international environments in Asia. We hope this issue of *HBDS* will contribute to the academic and professional development of society, and serve as a source of information for various disciplines and researchers.

We appreciate all the authors, reviewers, editorial board members, executive board members, as well as the journal's staff who have contributed to make this achievement a reality. Finally, we would like to invite our readers to publish your valuable papers with us. You can find more information at our website: <https://www.tci-thaijo.org/index.php/hbds>. We would also appreciate comments or suggestions from you to help us improve the journal.

Damrong Sattayawaksakul, Editor

Latent Class Analysis of Learning Strategies and Metacognition: Their Effects on Mathematics Performance

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Date Received: 6 November 2019 Revised: 23 January 2020 Accepted: 12 February 2020

Abstract

This paper aimed to determine the latent classes of learning strategies and metacognition and their effects on the mathematics performance of selected senior high school students in the Philippines. A total of 1,313 students was selected using multi-stage cluster sampling. A modified questionnaire was used to collect data. Results revealed that a five-class model was the optimal fit model for both learning strategies and metacognition. ANOVA test results revealed that there was a significant difference in the mathematics performance of the students, implying that different types of learning strategies affected student performance and that the “Control Strategies Group” performed most effectively compared to other groups. On the other hand, the metacognition approaches taken showed no significant differences. In addition, no significant interactions took place between learning strategies and metacognition. This means that the two variables behaved independently, and only the learning strategies affected respondents’ mathematics performance.

Keywords: *Latent class analysis, learning strategies, metacognition*

Introduction

Mathematics is a very important part of academics, as well as in everyday life. Knowledge and skills in mathematics are necessary in the workplace and in everyday life to solve basic and complex problems. Recognizing this, learning mathematics becomes a major emphasis at all levels of an educational institution. In fact, in most countries, mathematics is being taught across primary and secondary levels. Thus, everybody is expected to be equipped with the needed mathematical skills and knowledge. However, it is alarming to know that mathematics literacy of students nowadays is quite low.

Based on the report of the Programme for International Students Assessment (PISA) prepared by the Organization for Economic Co-operation and Development (OECD, 2018), mathematical literacy is defined as the process of “formulation, employment, and interpretation of mathematics in a varied circumstance.” It comprises thinking logically and using mathematical concepts and forecast phenomena. It measures the capability of individuals to recognize the role that is being played by mathematics in the world, and to make necessary decisions to be productive and yearning citizens. The PISA also was able to establish baseline proficiency level 2, on a 1–6 scale, at which individuals should be demonstrating this productive capacity as students, workers, and citizens. Based on the results of PISA 2015, in more than half of the participating countries from the middle and low-income class, the scores in mathematics obtained fell below level 2. This is an indication that the mathematics literacy of students is low.

An international assessment like PISA has given a result that is not different from mathematics literacy in the Philippines. The latest result of Trends in International Mathematics and Science Study (TIMSS; Fact Fish Research Made Simple! 2018) revealed that the mean performance of grade eight Filipino Students was 377.7, whereas the center of the data was 500. This result is quite alarming when compared to other countries in the world. Both the PISA and TIMSS results revealed that Filipino

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This paper was presented at the 7th International Scholar’s Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

students are performing below average mathematical literacy. The Philippines joined the international TIMSS assessment in 2003. Thus, this is the last reference that can be used in terms of international assessments. PISA 2018 had not yet been released when this paper was written.

Learning strategies may be critical to the academic performance of students. In the process of learning mathematics, students acquire learning strategies from their teachers and peers in order to improve their learning efficiency. According to the OECD (OECD, 2017), students who have outstanding mathematics performance usually adopt their learning strategies appropriately to manage their learning. On the other hand, students who have poor mathematics performance cannot actually apply effective learning strategies to solve problems. Based on the study of Lin and Tai (2015), in mathematics learning, students learn more effectively by consciously adopting effective learning strategies than just following their teachers' instructions. Clearly, learning strategies are a factor to be considered in attaining higher mathematics performance.

Besides learning strategies, another factor to focus on that affects mathematics performance is students' metacognition. As mentioned by Jaafar and Ayub (2010), mathematics performance and metacognition of students are positively correlated. They concluded that students' metacognition was the principal predictor of academic achievement in mathematics. Therefore, mathematics educators should give attention to mathematics metacognition as an important variable in mathematics education.

The concept of metacognition is connected to the knowledge of "when and how" to use a particular strategy for the learning process or in problem solving (Metcalfe & Shimamura, 1994). Metacognition, as defined by Schoenfeld (1987), means *thinking about thinking*, and it encompasses three important features which are: knowledge about our own thought processes, control or self-regulation, and belief and intuition. Meanwhile, according to Ozsoy (2011), metacognitive strategy is defined as methods used to help the students understand how they learn. By using a metacognitive strategy, students will be able to develop suitable plans during the teaching and learning process either by memorizing or routine.

The purpose of this study was to determine the latent classes of learning strategies and metacognition and their effects on students' mathematics performance. Most students in elementary and high school have poor performances in mathematics. Helping both teachers and students improve their performance by seeking possible solutions was one of the aims of this study. Although few studies have been conducted about Latent Class Analysis (LCA) and its effect on mathematics performance, the emphasis of this paper was the interaction of learning strategies and metacognition after identifying the latent classes of the students. Also, this is the first time that the Philippines has offered classes at senior high school level; hence, this paper is a pioneer in terms of including senior high school students as respondents.

Methodology

The respondents of this study were 1,313 senior high school students in Region IV-A (CALABARZON). The samples were selected using multi-stage cluster sampling. A modified instrument was utilized in this study. It was composed of three major parts. The first part involved the demographic profile of the students. The second part consisted of a questionnaire for learning strategies, and the third part dealt with metacognition. The students chose among three given options for each learning strategy, and in metacognition, they selected the item that best described their preparation for a mathematics exam.

To determine the latent classes of the students' learning strategies and metacognition, LCA was used. According to Lin and Tai (2015), LCA is a multivariate method designed to identify unobserved (or latent) subpopulations of individuals on the basis of multiple measures. LCA is like cluster analysis applicable to latent variables or categorical variables only. In this study, the respondents were divided into different groups based on learning and metacognition strategies using conditional probabilities computed for each category. The subjects that were considered in each of the classes of learning strategies and metacognition were highly homogeneous, and the groups

created were heterogeneous when compared with each other. The procedure was undertaken using Statistical Packages for Social Sciences (SPSS) and R studio software. These two packages were some of those available that included Latent Class Analysis.

To determine the best fit model, Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used. The optimal fit model for learning strategies and metacognition was the class number with the lowest AIC and BIC values.

To determine the effects of learning strategies and metacognition on students' mathematics performance, Analysis of Variance (ANOVA) was used. To determine the interaction effect of learning strategies and metacognition on the performance of the students, Two-way ANOVA was used.

Results and Discussion

Table 1 shows the descriptive statistics relevant to students in General Mathematics taken during the first semester of Grade 11. The table also shows that the average grade of the 1,313 students was 86.86, with a standard deviation of 4.96. This implies that the majority of students were performing well in math, with a slight deviation from the average grade across all genders, strands, and types of school.

The same table shows the distribution of respondents according to grade interval. The figures imply that most students obtained a grade from 85–89, which corresponded to 41.10% of the total number of students. On the other hand, only a few obtained a grade between 90 and 100. Therefore, most performed well, but not very well, and there was still a significant number of students who performed low (between 75 and 79). Based on the description of grades of the Department of Education, most students performed very satisfactorily in math, while few did not meet expectations.

Learning Strategies Results

The results of LCA for learning strategies are presented in Table 2. It shows two criteria (AIC and BIC) for each class model. As previously presented, the lowest values for AIC and BIC give the optimal fit model for learning strategies. The results imply that the AIC and BIC are the smallest for the five-class model (14,783.33 and 15,114.90, respectively). Thus, the five-class model is a suitable model for students' learning strategies.

Table 1. Distribution of Respondents According to Grade Interval in General Mathematics

Grade Interval	Frequency	Percent
74 and below (Did not meet expectations)	5	0.4
75–79 (Fairly Satisfactory)	78	5.9
80–84 (Satisfactory)	277	21.1
85–89 (Very Satisfactory)	540	41.1
90–100 (Outstanding)	413	31.5
Total	1313	100.0
Mean		86.86
Standard Deviation		4.96

The results of LCA for metacognition are also presented in Table 2. The values were smallest for the five-class model (15,689.48 and 16,021.06, respectively). Thus, the five-class model is a suitable model for student metacognition. All 1,313 students were divided into five classes of metacognition.

Table 2. Summary of AIC and BIC Criteria by Class Model for Learning Strategies and Metacognition

Model	Learning Strategies		Metacognition	
	AIC	BIC	AIC	BIC
2-class	16,639.81	16,769.31	17,672.73	1,7802.23
3-class	16,185.26	16,382.10	16,996.28	1,7193.12
4-class	15,494.10	15,758.28	16,437.76	1,6701.94
5-class	14,783.33	15,114.90	15,689.48	1,6021.06

After finding the optimal fit class model for learning strategies, the next step in the process was to determine the class probabilities and label each class. The probabilities of the five-class model are shown in Table 3. For class 1, the class probability (last row) indicated that 25% of the students were thus classified. For the remaining classes 16% of the students were classified as Class 2, 13% classified as Class 3, 16% classified as Class 4, and 3% classified as Class 5.

Table 3 shows the conditional probability of students in each class for individual items and options. The conditional probability for Class 1 students was .53, implying that 53% of students in Class 1 chose “I try to figure out what are the most important points to learn.” Similarly, the conditional probability for Class 1 students was .24, which also indicates that 24% of students under Class 1 chose “I learn as much as I can by heart.” The probability values presented in each category for individual indicators were used to assign a label to each class. Based on the distribution of conditional probabilities presented in Table 3, students under Class 1 who prepared for a mathematics exam, study mathematics, and solve mathematics problems, tend to use “Control” as learning strategy, since this strategy obtained the highest probability for each category (A1 to A3).

Table 3. Conditional and Class Probabilities on Learning Strategy Scale for the 5-Class Model

Item Code	Statement	Strategy	Class 1	Class 2	Class 3	Class 4	Class 5
A1	I try to figure out what are the most important points to learn.	Control	.53	.30	.33	.32	.24
A2	I try to understand new concepts by relating them to things I already know.	Elaboration	.24	.40	.39	.40	.31
A3	I learn as much as I can by heart.	Memorization	.24	.29	.28	.22	.44
B1	I try to figure out which concepts I still do not understand completely.	Control	1.00	1.00	1.00	.00	.00
B2	I think of new ways to get an answer.	Elaboration	.00	.00	.00	.98	.00
B3	I make myself check to see if I remember the work I have already done.	Memorization	.00	.00	.00	.00	.00
C1	I try to relate the work to things I have learned in other subjects.	Control	1.00	.30	.73	.41	.29
C2	I start by working out exactly what I need to learn.	Elaboration	.00	.56	.00	.42	.39
C3	I go over some problems so often that I feel as if I could solve them in my sleep.	Memorization	.00	.13	.25	.15	.56
D1	I go through examples again and again in order to remember the methods for solving mathematics problems.	Control	1.00	.00	.00	.25	.18
D2	I think about how the mathematics I have learned can be used in everyday life.	Elaboration	.00	.32	1.00	.58	.15
D3	I always search for more information to clarify the problem when I cannot understand something.	Memorization	.00	.67	.00	.17	.67
Class Probability			.25	.16	.13	.16	.03

For items B1, B2, and B3 under Class 1, the highest probability approached a value of one corresponding to item B1. This means that essentially all the students chose the item “I try to figure out which concepts I still do not understand completely.” This item falls under the “Control Strategy.”

For items C1, C2, and C3, still under Class 1, the highest probability of one was obtained by C1. This implies that all the students chose the item “I try to relate the work to things I have learned in other subjects.” This item falls under the “Control Strategy” as well, and none of the students chose the other two options.

For the last items D1, D2, and D3 under Class 1, the highest probability of one was again obtained by D1. This means that all the students chose “I go through examples again and again in order to remember the methods for solving mathematics problems.” On the other hand, none of the students chose the other two options. D1 still falls under “Control Strategy.” Among all the indicators under Class 1, the highest probabilities were under “Control Strategy.” Thus, the students under Class 1 were labeled as the “Control Strategy” students.

For the Class 2 probability values, it can be noticed in Table 3 that the highest conditional probabilities for the different indicators were obtained by A2, B1, C2, and D3, with probabilities of .40, 1.00, .56, and .67 respectively. These probabilities were under “Elaboration,” “Control,” “Elaboration,” and “Memorization.” Thus, Class 2 was labeled as a “Multiple Strategies” group. The students under this class tended to use all the strategies when studying for mathematics exams and solving mathematical problems. Class 3 students show a preference for using “Control” and “Elaboration” strategies since these strategies obtained the highest conditional probability for all the categories. The items A2, B1, C1, and D2 obtained the highest probabilities of .39, 1.00, .73, and 1.00 respectively. Hence, Class 3 students were labeled the “Control and Elaboration” group.

Class 4 students tended to use the “Elaboration” strategy, since this obtained the highest conditional probability for all the categories and options. The items A2, B2, C2, and D2 obtained the highest probabilities of .40, .98, .42, and .58 respectively. These items were all under the “Elaboration Strategy” group. Thus, Class 4 was labeled the “Elaboration Strategy” group. The last class in the model, Class 5, tended to use the “Memorization” strategy. Since this category obtained the highest conditional probabilities, the items A3, C3, and D3 obtained the highest probabilities of .44, .56, and .58, respectively. These items were all under the “Memorization Strategy” group. As a result, “Class 5” was labeled as the “Memorization Strategy” group. The students under this class tended to use memorization in studying for mathematics exams and solving mathematical problems.

Table 4 shows descriptive statistics regarding students’ mathematics performance for the five classes of learning strategies.

Table 4. Mathematics Performance Descriptive Statistics for Five-Class Model of Learning Strategies

Class	Type	N	Mean	Std. Deviation
1	Control	326	87.58	4.61
2	Multiple Strategies	211	86.44	4.98
3	Control and Elaboration	171	86.55	5.00
4	Elaboration	209	86.61	5.40
5	Memorization	396	86.74	4.93
Total		1313	86.86	4.96

ANOVA analysis indicated significant differences existed ($p < .046$). Thus, it can be concluded that learning strategies affected the mathematics performance of the selected respondents. Further analysis was performed using the Least Significant Difference (LSD) post hoc test (Table 5). It also showed that significant differences existed, as all the significance values were less than the 5% level.

Referring back to Table 4, the mean score of students for the five types of learning strategies showed that students in the Control Strategies group performed better; this was followed by the Memorization Strategies group. The students with the lowest mathematics performance were found in the Multiple Strategies group. These results contradict those of Lin and Tai (2015) in Taiwan. In their study, the multiple strategies group was found to be the most effective among all the learning

strategies. Their control strategy group had the lowest performance. It can be noticed, however, that there are minimal differences in the performance between the groups in the present study, and the means differed only at around the 5% level.

On the basis of the present results, it is concluded that the control strategy was the most effective in achieving high performance in mathematics among the selected senior high school students. Control strategies are defined as determining what students have learned and what they are still needing to learn. On the other hand, students using multiple strategies tended to have low mathematics performance. This implies that using multiple strategies in learning mathematics is not as effective as using a single strategy—specifically, the control strategy.

Table 5. LSD Post Hoc Test on Mean Grade Differences between Classes

(I) Highest Probability Class		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
LSD Control	Multiple	1.13	0.44	.100	0.28	1.99
	Control and Elaboration	1.02*	0.47	.029	0.11	1.94
	Elaboration	0.96*	0.44	.028	0.10	1.82
	Memorization	0.83*	0.37	.025	0.11	1.56

* $p < .05$

Metacognition Results

The next part shows the results of the metacognition of the respondents selected for the study. The probability values of the five-class model are presented in Table 6. For students under Class 1, the mean class probability was .23, implying that 23% of the students were classified as Class 1 students. For Classes 2, 3, 4, and 5, the class probabilities are shown, indicating that 20% of the students were classified as Class 2 and also as Class 3, 24% were classified as Class 4, and 13% were classified as Class 5.

Table 6 shows the conditional probabilities of students in each class for individual items and options. The conditional probability for Class 1 students indicated that no student chose either the E1 or E3 options. On the other hand, there was a high probability (99%) of students choosing “I set specific goals before I begin a task.” This item falls under the “Task Strategy” heading.

The probability in each category for individual indicators was used to assign a label to each class. Based on the distribution of conditional probabilities presented in Table 6, students under Class 1 who prepared for the mathematics exam, studied, and solved mathematics problems tended to have knowledge of both “Person and Task,” since this strategy obtained the highest probability for each category. The items E2, F1, G1, and H2 obtained the highest probabilities. All these items are under “Task” and “Person” knowledge of metacognition. Thus, Class 1 was labeled the “Knowledge of Person and Task” group.

The students under Class 2 were inclined to have “Multiple” strategies when studying for a mathematics exam and in solving mathematics problems. All metacognitive strategies obtained the highest conditional probabilities, with items E3, F2, G1, and H3 obtaining the highest probabilities. These items fell under different metacognition strategies. As a result, Class 2 was labeled “Knowledge of Multiple Strategies” group.

The students under Class 3 tended to have knowledge of “Strategy,” since this metacognitive strategy obtained the highest conditional probability for all categories. The items E3, F3, G3, and H3 obtained the highest probabilities. These items are all under the “Strategy” group. Hence, Class 3 students were labeled “Knowledge of Strategy” group.

Class 4 students had an inclination to have knowledge of “Person,” since this class obtained the highest conditional probabilities for all the categories and options. The items E1, F1, G1, and H1 obtained the highest probabilities. These items are all under the “Person” group. Thus, Class 4 was labeled “Knowledge of Person” group.

Table 6. Conditional and Class Probabilities on the Metacognition Scale for the 5-Class Model

Item Code	Statement	Strategy	Class 1	Class 2	Class 3	Class 4	Class 5
E1	I am aware of my intellectual strengths.	Person	.00	.00	.00	1.00	.00
E2	I set specific goals before I begin a task.	Task	.99	.00	.00	.00	.00
E3	I use different learning strategies depending on the situation.	Strategy	.00	1.00	1.00	.00	1.00
F1	I know what kind of information is most important to learn.	Person	.38	.00	.00	.37	.95
F2	I have a specific purpose for each strategy I use in doing a task.	Task	.24	1.00	.00	.30	.00
F3	I summarize what I've learned after doing a learning task.	Strategy	.37	.00	1.00	.33	.00
G1	I learn best when I know something about the topic.	Person	.63	.70	.16	.65	.70
G2	I am good at organizing information.	Task	.19	.15	.16	.13	.14
G3	I have control over how well I learn.	Strategy	.17	.13	.66	.21	.16
H1	I know how well I did once I finish a test.	Person	.27	.27	.28	.36	.28
H2	I ask myself periodically if I am meeting my goals.	Task	.40	.30	.29	.32	.32
H3	I organize my time to best accomplish my goals.	Strategy	.33	.43	.43	.32	.40
Mean Class Probability			.23	.20	.20	.24	.13

The last class in the model, Class 5, tended to have knowledge of both “Person and Strategy,” since these metacognitive strategies obtained the highest conditional probabilities. The items E3, F1, G1, and H3 obtained the highest probabilities. These items are under the “Person” and “Strategy” groups. The students under this class tended to have a knowledge of strategy in studying for a mathematics exam and solving mathematical problems. As a result, Class 5 was labeled as “Knowledge of Person and Strategy” group.

Table 7 shows the descriptive statistics about the mathematics performance of the students using the five classes of metacognition. It can be noticed that there are slight differences in performance between the groups. Further testing (ANOVA) was conducted to investigate if the differences were significant; no differences were found ($p = .61$). Thus, it can be concluded that the metacognition approaches of students had no effect on the performance of the selected students in mathematics.

Table 7. Descriptive Statistics of Mathematics Performance for Five-Class Model of Metacognition

Class	Type	N	Mean	Std. Deviation
1	Person and Task	296	86.60	5.11
2	Multiple Strategies	267	86.75	5.03
3	Strategy	256	86.93	4.58
4	Person	320	86.86	4.93
5	Person and Strategy	174	87.35	5.18
Total		1313	86.86	4.96

Interaction Effect of Learning Strategies and Metacognition

As shown in Table 8 below, the significance value for the interaction effect of learning strategies and metacognition on the performance of selected students in mathematics was .36, which

is greater than .05. This means the null hypothesis must be rejected. Thus, learning strategies and metacognition of students did not affect the performance of students in mathematics in this study. The purpose of using Two-way Analysis of Variance was to test the interaction effect of two factors on the dependent variable. In this case, the interaction effect was not significant, implying that the learning strategies and metacognition of students had no interaction effects on their performance in mathematics. However, the learning strategy value ($p = .037$) was significant, while the effect of metacognition was not significant. This implies that the learning strategies alone can affect the mathematics performance of the selected students. As shown in the partial eta squared column, the effect of interaction on the performance of students was only 1.3%, which is quite insignificant. In addition, learning strategies accounted for 0.8% effect, while metacognition recorded a 0.2% effect on the variation of the mathematics performance of the selected students.

Table 8. Interaction Effect of Learning Strategies and Metacognition on Student Performance

Sources	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	737.32	24	30.72	1.26	.184	.023
Intercept	8,465,277.03	1	8,465,277.03	345,843.08	.000	.996
Metacognition	65.23	4	16.31	.67	.615	.002
Learning Strategies	250.09	4	62.52	2.55	.037	.008
Interaction	426.33	16	26.65	1.09	.361	.013
Error	31,526.66	1288	24.48			
Total	9,937,762.75	1313				
Corrected Total	32,263.97	1312				

In terms of learning strategies, the results of this study confirmed the results of other studies conducted in the Philippines and abroad. However, in terms of metacognition, the results of this study contradict the results of all other studies conducted locally and internationally. This might be because the sample for this study was senior high school students. Senior high school in the Philippines just started in 2016. The students might still be in the period of adjusting from being in high school to preparing for college. Another reason to be considered is that the results of studies conducted in other countries might differ on account of differences in their curricula. Hence, this study showed that the learning strategies practiced by students affect their performance in mathematics. On the other hand, this study does not support the theory that metacognition practiced by students affected their performance.

Conclusions

Learning strategies and metacognition of the students are vital in achieving higher performance in mathematics. In this study, it was found that the learning strategies affected the way students study and prepare for examinations in mathematics. However, metacognition was not shown to affect their performance. Hence, educators should focus more on developing students' learning strategies. The Department of Education could draft policies for using the empirically sound results of this study to boost the mathematical abilities of learners.

Limitations

A similar study could be conducted using other types of learning strategies and metacognition. It is recommended to have a larger sample size to ensure the aptness of the Latent Class Models. A more in-depth LCA could be done regarding the metacognition strategies of the students using other metacognition types.

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Perceptions of Premarital Sex among Students at a Faith-Based University

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Date Received: 8 November 2019 Revised: 20 January 2020 Accepted: 2 February 2020

Abstract

In this study, the relationship between moral development activities and perceptions of premarital sex was investigated among students at a faith-based university. Information was gathered using survey questionnaires, distributed through the university intranet, and the data were analyzed using a statistical software package. Undergraduate students ($N = 103$) took part in the study. Most university students were against sex before marriage. Moral development activities taught them to abstain from premarital sex. Responses showed that the factor that most affected perceptions of premarital sex was the Internet. Movie/television viewing was also found to be an important factor that shaped perceptions of premarital sex. Moral development activities and perceptions of premarital sex were shown to be weakly related ($r = .03$). Further improvement of moral development activities is needed to help students understand the value of sex. Future research in this area could use qualitative approaches to examine the factors that influence perceptions of premarital sex.

Keywords: *Moral development, morality, premarital sex, sexual activity*

Introduction

Empirical studies (e.g., Chiao & Yi, 2011; Christopher & Frandsen, 1990; Gyan, 2018) have focused on strategies to reduce premarital sex, but not many have incorporated the impact of religious moral development on such behavior. This study addressed this knowledge gap. The prevalence of premarital sex has increased over the years. In 2002, 34% of America women aged 18–24 years were involved in sexual activity, and this figure increased to 41% from 2006–2010 (Abma & Martinez, 2017; Abma, Martinez, Mosher, & Dawson, 2004; Martinez, Copen, & Abma, 2011). According to Finer and Zolna (2016), 75% of unintended pregnancies occurred among American girls 15 to 19 years old, and adolescent pregnancies accounted for about 15% of all unintended pregnancies worldwide due to premarital sex.

According to Focus on the Family (1999), factors associated with premarital sex among American adolescent were alcohol and drug use; limited parental monitoring; frequent family relocations; only one parent in the household; early steady relationships among adolescents; and peer pressure. Peer pressure influences how young people dress, the kind of music they listen to, and the types of behavior they engage in, including sexual activity (Wells, 2020). Often young people are challenged by strong social, peer, and cultural pressure to engage in premarital sex (Chekole, Gebrehana, & Terefe, 2017; Sieving, Eisenberg, Pettingell, & Skay, 2006).

Sexual practices displayed on the Internet or in the media influence the behavior of young people, as do social media such as adult videos and pictures of nude people (Collins, Elliott, Berry, Kanouse, Kunkel, Hunter, & Miu 2004). Asekun-Olarinmoye, Asekun-Olarinmoye, Adebimpe, and Omisore (2014) found that media portrayals of sexual attitudes and expectations made to young people at a critical developmental stage influenced them to normalize or take part in such behaviors. These results are also supported by other studies. Adolescents were more permissive towards sex because of Internet access, exposure to Sexually Explicit Media (SEM), and pornography or nudity on the web (Arulogun, Ogbu, & Dipeolu, 2016; Bragg & Buckingham, 2002; Owens, Behun, Manning, & Reid, 2012).

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

Despite the powerful influence of peers, the media, and the Internet, Tant (2011) suggested that religious moral development could reshape the behavior and attitudes of young people towards premarital sex. Moral development focuses on emergence, change, and understanding of morality from adolescence to adulthood. Moral development is influenced by an individual's experiences and responses when faced with moral issues. It concerns an individual's growing sense of what is right and wrong (Homiak, 2019). Moral development is a process through which appropriate attitudes and behaviors towards other people in society are developed, based on social and cultural norms, rules, and laws (Wells, 2020). Teaching institutions could be effective resources in implanting moral values in young people if moral development and sex education topics were integrated into curricula (Kanzal, Subikshalakshmi, & Goswami, 2016). Lamb supports this perspective, suggesting that behavior and attitudes among young people towards premarital sex could be modified, and a respectful attitude towards others could be developed, to the benefit of society (Lamb, 1997).

This study was conducted in a private university in Thailand that emphasizes the importance of religious moral principles. The Christian belief is that sex before marriage is a sinful act towards God; thus, the University is against premarital sex, and only supports sex within marriage. This context includes strict rules governing student relationships and physical contact—such as holding hands, hugging, and kissing on and off campus—as an aid to maintaining its Christian ethos.

Purpose of the Study

This study's purpose was to describe, analyze, and evaluate perceptions of premarital sex at a faith-based university. More specifically, student perceptions about premarital sex, the extent to which moral development activities on campus influenced these perceptions, and major factors contributing to perceptions of premarital sex were investigated. The study posed the following research questions:

1. What are the perception levels of students pertaining to premarital sex?
2. How often do students attend moral development activities on campus?
3. To what extent have student perceptions of premarital sex been influenced by the moral development activities on campus?
4. What are the key factors that have impacted student perceptions of premarital sex?

Literature Review

Prevalence of Premarital Sex amongst Young People

In many countries, premarital sex is a common practice among young people (e.g., Finer, 2007; Podhisita, Xenos, & Varangrat, 2004; Wang, Li, Stanton, Kamali, Naar-king, Shah, & Thomas, 2007). For example, in the Indian slums of Delhi and Lucknow, it was discovered that 75.3% of young people engaged in premarital sexual activity, while in Malaysia, 47.2% of the young girls aged 12 to 14 years old engage in premarital sex (Ghani, Abdullah, Akil, & Nordin, 2014). Peltzer and Pengid (2015) found that 76.7% of adolescents reported engaging in premarital sex in the region of Central America. The reasons for the prevalence of premarital sex among young people are their attitudes towards sex, such as a desire for sex, and the seeming appropriateness of it in their societies (Bhatta, Koirala, & Jha, 2013; Yip, Zhang, Lam, Lam, Lee, Chan, & Fan, 2013).

Factors that Impact Premarital Sexual Activity

There are a number of factors that impact the prevalence of premarital sex across different countries. Wong, Chan, Koh, Tan, Lim, Emmanuel, and Bishop (2009) showed that the major factors that influenced premarital sexual activity among young people in Malaysia were peer pressure and permissiveness regarding sex. Chi, Yu, and Winter (2012) found that the major factors of premarital sexual behavior among young people in China were watching pornography, spending time on the Internet, and talking with friends about sex. In Cambodia, the factors that influence premarital sex are associated with family, peers, school, and community. Premarital sexual behavior in both males and females was influenced by drug use and peer pressure (Yi, Poudel, Yasuoka, Palmer, Yi, & Jimba, 2010).

In Ethiopia, Hurissa, Tebeje, and Megersa (2014) found that 39.7% of young people between 15–19 years old were engaged in premarital sex. They discovered that falling in love, peer pressure, desire, and alcohol were all factors that contributed to premarital sex.

Exposure and accessibility to SEM has also been found to be a major contributor to the prevalence of premarital sexual behaviour (Brown & L'Engle, 2009; Kraus & Russell, 2008). Findings from Lou, Cheng, Gao, Zuo, Emerson, and Zahin (2012) suggested that young people learnt mainly about sex from the Internet and media. These authors stated that higher levels of premarital sexual behavior were found among young people who viewed SEM, and that young people learn about sex when they see it on the Internet and are encouraged to engage in such behavior.

The family environment, such as levels of family connectedness, also are related to premarital sex attitudes among youth (e.g. Markham, Tortolero, Escobar-Chaves, Parcel, Harrist, & Addy, 2003; Henrich, Brookemeyer, Shrier, & Shahar 2006; Manlove, Wildsmith, Ikramullah, Terry-Humen, & Schelar, 2012.) Dittus, Michael, Becasen, Gioppen, McCarthy, and Guilamo-Ramos, 2005 found that students who perceived high levels of family connectedness were less likely to engage in premarital sexual activity. Other studies by Donenberg, Wilson, Emerson, and Bryant (2002), Mehrotra, Zimmerman, Noar, and Dumenci (2013), and Suwarni, Ismail, Prabandari, and Adiyanti (2015) suggest that those who experienced lower parental monitoring were more likely to engage in premarital sex.

The Interrelation of Moral Development and Religious Values

Moral development consists of creating an appropriate environment for incorporation of components of social morality into the student's personality structure, which leads to the implementation of proper moral conduct. Moral development and religious values are related because religious values strengthen moral knowledge and action (Manea, 2014). According to Kuar (2015), moral development and religion have similar concepts about influencing thinking, feeling, and acting regarding issues of right and wrong. Historically, moral teachings have been central to Christianity, and the Bible—a book of ethical guidance—is at its core (Noelliste, 2020). Moral development is therefore associated with religion.

Impact of Moral Development Activities on Premarital Sex

Researchers have found that religion has significant correlations with premarital sex (Ghaffari, Gharghani, & Rakshanderou, 2015; Opayemi, 2011; Penhollow, Young, & Bailey, 2007). Penhollow et al. (2007) discovered that regular religious service attendance and a positive religious feeling associated with religious exercises were associated with lesser premarital sexual activity among college students. Religious involvement is also a protective factor from premarital sexual behavior among young people (Ghaffari et al., 2015; Helm, McBride, Knox, & Zusman, 2009; McCree, Wingood, DiClemente, Davies, & Harrington, 2003; Penhollow et al., 2007; Regnerus, 2005).

According to the research featured in this section, factors such as peer pressure, exposure to sexually explicit media, and family environment are important factors that influence young people's perceptions of premarital sex. The literature also suggested that religious moral development is related to premarital sexual attitudes among young people.

Methodology

In this research, religious moral development activities were used to promote the Christian ethos of the university where this study was conducted. These included certain forms of collective worship. Collective worship is where people are given an opportunity to worship God within a particular faith, as in Christianity or Islam (Humanists UK, 2019). Collective worship such as dorm worship, morning worship, and assembly were part of the moral development activities on campus.

A quantitative design was used to examine students' perceptions of premarital sex and to investigate any correlations between their involvement in moral development activities and perceptions of premarital sex. Opinions were collected via a quantitative online, self-completed questionnaire. Student anonymity was preserved throughout. This was particularly significant, given

the sensitive nature of the research topic. No time limitations were placed on completion of the survey. The data were analyzed using a statistical software package.

The null hypothesis adopted was that: "There is no relationship between moral development activities attendance and perceptions of premarital sex among international students".

Sampling

Students studying in the international program were surveyed ($N = 400$). The sample size needed for the study was calculated using the equation devised by Yamane (1957), $n =$ calculated sample size, $N =$ total number of population, and $e =$ allowable error. In this research, the margin of error was 8% of the sample size. Hence, the sample size was 110.

$$n = \frac{400}{1 \times 400(0.08)^2} = 110$$

The sample was drawn from the population by convenience sampling. The online survey was distributed through the university intranet to all students in the international program. Students could then choose whether to take part or not. The reason that this sampling technique was chosen was because it eliminated bias by giving all members of the population an equal chance to participate. A total of 103 students responded to the survey.

Research Instrument

The questionnaire was divided into five sections: demographic data, perceptions toward premarital sex, participation in religious moral development activities, impact of religious moral development activities on perceptions of premarital sex, and the factors that influenced perception of premarital sex. Apart from the demographic data, each of the aforementioned sections contained a series of statements to which participants responded by choosing one of the options on a five-point Likert scale. The final section asked participants about the factors that influenced their perceptions of premarital sex. This section contained an open-ended question so that participants could write their personal opinions. Responses given within this section gave further insights into the key influencers of student perceptions, and the means by which these perceptions were shaped.

Validity and Reliability

The section of the questionnaire that focused on perceptions of premarital sex was adopted from Adhikari and Adhikari (2017). The original questionnaire was reviewed by experts. Modifications were made according to their feedback. Validity was calculated using Cronbach Alpha coefficient (a score of .70 was obtained).

The sections of the questionnaire that focused on moral development activities participation and the impact of moral development activities on premarital sex perception were self-constructed. Measurement was in the form of responses such as Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. The Item-Objective Congruence index, devised by Rovinelli and Hambleton (1977), was used to test the validity of these questions. It was given to five experts within the University, and amendments were made according to their feedback. These experts assessed each item, and overall the questionnaire was given a validity coefficient score of more than .50.

Data Collection

A link to the survey was sent to all undergraduate students within the international program through the university intranet. During the process of completing of the questionnaire, participants had no contact with the researcher or anyone else involved with the research.

Data Analysis

The data were analyzed using a statistical software package. A thematic analysis was used to analyze the factors that affected premarital sex among students. Thematic analysis is a widely-used, foundational method for analyzing qualitative data (Braun & Clarke, 2006).

Results

Demographic data are given in Table 1. The chart shows that the vast majority (90.3%) of the participants were from Asia. Most participants were unmarried, 73.8% were single (not in a dating relationship), and 20.4% were dating. The majority of respondents were between the ages of 16 and 24; half were aged between 21–24 years old. Most respondents (85.4%) classified themselves as Seventh-day Adventist (SDA) or ‘other Christian.’ The rest of this section focuses on responses to research questions.

Table 1. Demographic Description of the Sample of University Students

Gender	Male 57 (55.3%)	Female 46 (44.7%)			
Nationality	Africa 6 (5.8%)	Asia 93 (90.3%)	Australia 1 (1%)	Europe 2 (1.9%)	South America 1 (1%)
Status	Dating 21 (20.4%)	Married 6 (5.8%)	Single 76 (73.8%)		
Age	16–20 30 (29.1%)	21–24 53 (51.5%)	25–29 14 (13.6%)		30 above 6 (5.8%)
Religion	Buddhist 12 (11.7%)	SDA & Other Christian 88 (85.4%)	Others 1 (1%)		No religion 2 (1.9%)

1. What are the perceptions of surveyed students on premarital sex?

In terms of students’ perceptions of premarital sex, most students were against sex before marriage (Table 2). The results of the first four questions indicate that students generally “Agreed” (mean range 3.26–4.00), which shows that they were largely against premarital sex. Scores also showed that students mostly “Disagreed” that premarital sex is acceptable for relation purposes such as selecting an ideal spouse, if a couple practiced safe sex, and if he/she had only one sexual partner.

Table 2. Perceptions of Premarital Sex among Students

Perception	Mean
PM 1 A woman should be virgin at marriage.	3.80
PM 2 A man should be virgin at marriage.	3.70
PM 3 Neither a man nor woman should have premarital sex.	3.63
PM 4 Premarital sexual relationships should be absolutely prohibited.	3.62
PM 5 Sexual relations before marriage is a normal phenomenon because it is a kind of biological need.	2.70
PM 6 Premarital sexual relationships should be acceptable because they can help to select an ideal wife/husband.	2.27
PM 7 Pre-marital sexual relations are acceptable if a “couple” fall in love.	2.26
PM 8 Premarital sexual relations are acceptable if a “couple” practice safe sex.	2.48
PM 9 Premarital sexual relations are acceptable if he/she has only one sexual partner.	2.50
PM 10 Premarital sexual relations are acceptable if the “couple” plan to marry in the future.	2.71

Legend: 1.00–1.75 = Strongly Disagree; 1.76–2.50 = Disagree; 2.51–3.25 = Neutral; 3.26–4.00 = Agree; 4.01+ = Strongly Agree

However, in regards to the statement that premarital sexual relations are acceptable “if [a] couple plan to marry in the future,” scores reflected some neutrality amongst students (mean range 2.51–3.25). Notable numbers of students remained “Neutral” for every statement, with no “Strongly Agree” (4.01 or more) nor “Strongly Disagree” (1.00–1.75) scores; perhaps this was due to the topic’s sensitivity.

2. How often do students attend moral development activities on campus?

The findings (Table 3) suggest that most students “Often” (mean score 3.26–4.00) or “Always” (mean score 4.01 or more) attended Moral Development Activities. Dorm worships, family groups, and AY programs were the least-well attended activities; many “Never” attended AY programs. Chapel was the best-attended moral development activity, with most students “Always” attending.

Table 3. Attendance at Moral Development Activities on Campus

Activities on Campus	Mean
10 Days of Prayer	3.56
Adventist Youth (AY) Program	2.21
Assembly	4.17
Chapel	4.60
Church Service	4.03
Dorm Worship	3.35
Family Group	3.24
Festival of Faith	4.08
Sabbath School	3.66
Vespers	4.08

Legend 1.00–1.75 = Never; 1.76-2.50 = Occasionally; 2.51–3.25 = Sometimes; 3.26–4.00 = Often; 4.01 or more = Always

3. To what extent have students’ perceptions of premarital sex been influenced by the moral development activities on campus?

Participants assessed the extent to which participation in moral development activities had influenced their perceptions of premarital sex. The data are given in Table 4.

Table 4. The Impact of Moral Development Activities on Perceptions of Premarital Sex

Moral development activities have taught me...	Mean
To view sex as sacred to marriage.	3.67
To value sexual abstinence before marriage.	3.79
I should respect my body and keep it pure for marriage.	4.02
I should respect others and help them keep their bodies pure.	3.99
I should control my sexual desires until marriage.	3.90
Sex is important and that of should not be taken lightly.	3.95
The importance of controlling sexual thoughts.	3.90
Sex is not only about physical intimacy but also spiritual and emotional.	3.90
To avoid sexual activity with a partner in a relationship.	3.85
Premarital sex is unholy.	3.87
Sex is God’s gift to be used in marriage, not before marriage.	3.98
Premarital sex is a sinful in a sight of God.	3.91

Legend: 1.00–1.75 = Strongly Disagree; 1.76-2.50 = Disagree; 2.51–3.25 = Neutral; 3.26–4.00 = Agree; 4.01+ = Strongly Agree

The results indicate that students generally “Agreed” or “Strongly Agreed” (mean score 3.26–4.25) that they have been taught not to have sex before marriage in moral development activities, a minority of students remained “Neutral”. A small number of students “Disagreed” with the statements, indicating that they have not been taught to abstain from premarital sex in the moral development activities. Maybe this is because students did not regularly attend any of the moral development activities.

4. What are the key factors that have impacted student’s perceptions of premarital sex?

The findings shown on Table 5 were generated from the final section of the questionnaire where participants were asked to select the key factors that had influenced their perceptions of premarital sex. The table shows the percentage of participants who selected the various factors listed.

Table 5. Factors that Impacted Student’s Perception of Premarital Sex

Internet	33.0%
Movies/Television	28.2%
Other	28.2%
Influence from Friends	7.8%
Drugs/Alcohol	2.9%

The key factor that influenced students’ perceptions of premarital sex was the Internet. The following most significant factors were “Movies/Television” and “Other”—such as family, church, desire, Western culture, and community influence mention by the participants, being both at 28.2%. The results also indicate that “Influence from friends” and “Drugs/Alcohol were the least impacting factors on perception of premarital sex.

In the final section of the survey, respondents choose to give a more detailed explanation of how specific factors influenced their personal perception of premarital sex. Only 46% of participants completed this section and most of these participants gave general responses that were not related to their own personal opinions or experiences. The qualitative statements of participants will be discussed later.

5. Correlation between attendance at moral development activities and perceptions of premarital sex

Table 6 shows correlation coefficients between the overall attendance score for each moral development activity and the overall scores for each of 10 statement pertaining to students’ perceptions of premarital sex (please see statements in Table 2, PM 1 to PM 10).

Table 6. Correlation Coefficients - Moral Development Activities and Perceptions of Premarital Sex (n = 103)

Program	PM1	PM2	PM3	PM4	PM5	PM6	PM7	PM8	PM9	PM10
Ten Days Prayer	.19	.30**	.21*	.36**	-.25**	-.15	-.35**	-.40**	-.39**	-.40**
AY Program	.19	.16	.12	.30**	-.05	-.17	-.30**	-.25*	-.33**	-.34**
Assembly	.28**	.32**	.14	.14	-.05	-.03	-.04	-.10	-.12	-.12
Chapel	.23*	.27**	.12	.16	.07	.06	.03	-.12	.03	-.15
Church Service	.22*	.33**	.18	.26**	-.16	-.12	-.29**	-.30**	-.29**	-.37**
Dorm Worship	.20*	.24*	.08	.29**	-.12	-.09	-.35**	-.25*	-.22*	-.23*
Family Group	.17	.15	.17	.24*	-.10	.01	-.21*	-.19	-.26**	-.32**
Fest. of Faith	.32**	.32**	.20*	.34**	-.08	-.15	-.21*	-.29**	-.18	-.30**
Sabbath School	.30**	.31**	.22*	.30**	-.19	-.09	-.25*	-.31**	-.20*	-.30**
Vespers	.28**	.31**	.16	.24*	-.18	-.15	-.25*	-.32**	-.26**	-.37**

The correlation analysis indicated that for the first four statements, a positive correlation was found between moral development activities attendance and perceptions of premarital sex. For the last six statements, a negative correlation was found between moral development activities and

perceptions of premarital sex. However, for the statement that a premarital sexual relationship is acceptable because it could help to select an ideal wife/husband, no correlation was found between it and any moral development activities. Overall, moral development activities and perceptions of premarital sex were weakly correlated.

Discussion

The findings suggested that the majority of students' were against sex before marriage. This could be because the vast majority of students attended most moral development activities, or it could also be because almost 90% of participants were Christian, and so they were generally against premarital sexual activity. According to Podhisita et al. (2004), most Thai young people have permissive attitudes towards sex, but this study was not conducted in a religious-based context.

The findings suggest that students' perceptions of premarital sex could be influenced by moral development activities. Most students had been taught not to engage in premarital sex in moral development activities. This could be one reason that most students were less permissive towards sex before marriage, or perhaps they were inspired to follow the university's principles and values due to their frequent attendance at the moral development activities in which these were promoted (Helm et al., 2009). At least 30% had a neutral stance towards premarital sex. This might be because these students did not regularly attend moral development activities, or disagreed with the values and principles of the university. It could also be the case that there was not sufficient discussion on premarital sex in moral development activities. In previous research, it was found that students who regularly attended religious moral development activities and had more discussions about sex were influenced in their perceptions (Burdette & Hill, 2009; Ghaffari et al., 2015; Opayemi, 2011; Regnerus, 2005). In this study, the findings suggest that there was a weak correlation between moral development activities attendance and perceptions of premarital sex, indicating that these activities may have had a small impact on students' perceptions.

The major contributing factor to perceptions of premarital sex was the Internet, a finding similar to that found by Brown and L'Engle (2009), as well as Habesha, Aderaw, and Lakew (2015). The findings also suggest that movies/television were an important factor that contributes to perceptions of premarital sex, which agrees with Ward and Friendman (2006). Interestingly, other findings (Markham et al., 2003; Henrich et al., 2006; Suwarni et al., 2015; Romer et al., 1999) indicated that family environment is an important factor affecting perception of premarital sex. This study did not look at the role played by family environment in shaping perception of premarital sex. However, it was mentioned by participants in the "Other" category.

In the open-ended question, there were five factor categories: 1) Internet; 2) movies/television; 3) drugs and alcohol; 4) influence from friends; and 5) other. In the category "Other," participants mentioned factors that impacted their perception of premarital sex, such as family, church and cultural factors, but only a few shared their personal opinions. The following analysis only focused on Internet and movie/ television factors, because many participants shared comments that related to these factors in particular.

Within the responses related to the Internet, the theme of 'power' was predominant. The participants suggested that the Internet had power to cause individuals to think and act in certain ways. This is shown in the following statements:

Participant 2: "The Internet has a wide variety of information that causes one's mind to be influenced by world's perception."

Participant 19: "Internet is the most influential. People nowadays believe in everything the Internet says specifically Google. And if the Internet says it's normal to have sex, then people will assume it's normal, since everyone on the Internet is doing it."

Participant statements suggested that the Internet had power to change perceptions of premarital sex because it is influential and it is able to normalize certain forms of sexual behavior. These responses correspond with findings from a study conducted by Habesha et al. (2015), who

implied that there is much information regarding sex on the web, which has the power to change the mindset of young people about sex. Participants in this study had very little discussion about sexual behavior with parents or in school, which led them to search for sexual information online. Furthermore, another participant mentioned that the wide availability of adult content, such as pornography, causes young people to assume that premarital sex is normal.

Participants also suggested that the Internet has a wealth of information that is open and available to everyone, which also connects to the issue of the Internet being very powerful:

Participant 27: “the Internet is the major reason that leads to all other existing factors. Since everything can be searched for, people usually have a tendency to find interesting things that could satisfy their physical and emotional needs. Also, all the facts and video about sex can be found on the Internet.”

This participant’s statement is similar to the findings of Kraus and Russell (2008) who found that because of accessibility to the Internet, young people can view SEM, such as pornographic videos and information related to sexual activity, and that the Internet promotes and sells SEM, which causes young people to change their attitudes towards premarital sex.

In the analysis of respondents’ comments, movies/television were shown to be the second most influential factor. The key theme within this category was the normalizing of sexual activity. Analyzing the statements, it seems that frequency and openness of sexual activity in movies and on television contributes to premarital sexual activity among young people.

Respondent 1: “often the movies will show the scenes of a couple is having premarital sex before marry, and the couple later on still have a blessed marriage. Since it is shown by the TV, then the audience who are watching will have a mindset that premarital sex is fine.”

Respondent 2: “Movies or dramas seem to have no problem with sexual relationships, so it could influence people.”

Respondent 4: “Dramas, movies are showing too much of romantic scene that only should be done after marriage.”

The respondents’ comments suggest that there is an openness and frequency of sexual activity in the media, which may convince young people that premarital sex is normal, a finding supported by the research of Ward and Friedman (2006).

Conclusion

The majority of participants were against sex before marriage. Most of the students had been taught to value sex within marriage. Moral development activities might have a small impact on students’ perceptions of premarital sex, because the findings suggest that moral development activities and perceptions of premarital sex were related. The Internet is a major factor that contributed to perceptions of premarital sex, and the results indicated that movies/television were also an important factor that influenced participants’ perceptions.

Implications

There is a need for improvement of moral development activities so that students would want to participate regularly. Moral development activities might incorporate more discussions about sex before marriage that could help students to understand the value of sex. The university might also take note of factors that influence perceptions of premarital sex, and these factors could be incorporated into discussions within moral development activities.

Recommendations for Future Research

Future research could investigate how religious moral development activities influence perceptions of premarital sex among young people using regression analysis; this would be beneficial for investigating the extent to which religious moral development influences perceptions of premarital

sex. Qualitative research would also be helpful in conducting detailed examination of the factors that influence perceptions of premarital sex, because it may give a deeper understanding of the context of these factors, and how religious moral development activities can affect perceptions about premarital sex.

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Analysis of the Effect of Profitability, Solvability, and Dividend Policy on Banking Firm Value

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Date Received: 13 November 2019 Revised: 26 January 2020 Accepted: 11 February 2020

Abstract

This research was conducted to investigate the effect of profitability, solvability, and dividend policy on the maximization of firm value. In this study, profitability was represented by Return on Equity (ROE) and Return on Assets (ROA), while solvability was examined by the Debt to Equity ratio (DER) and Debt to Assets ratio (DAR). The dividend payout ratio (DPR) was a proxy for the firm's dividend policy, and firm value was examined by Price to Book Value (PBR). The purpose of this study was to examine the influence of profitability, solvability, and dividend policy on firm value. The sample included banks listed on the Indonesia Stock Exchange for the 2012–2014 period with a total of five banks using purposive sampling method. The analysis tool used was multiple regression analysis. Results from an F-test showed that the model has prediction ability of 80.4%, while the remaining 19.6% were influenced by other factors outside of this model. ROE had a significantly positive influence on firm value, implying that higher profitability (ROE) of a firm will result in higher firm value. However, solvability (DAR) was significantly negative. An increase in solvability (DAR) of a firm will result in lower firm value.

Keywords: *Bank, dividend policy, firm value, profitability, solvability*

Introduction and Research Problem

As a financial intermediary, a bank is an institution that collects and distribute funds from the public or investors, as well as provides various services in the context of a financial intermediary (Usman, 2001; Widati, 2012). The growing number of banks, with some listed in the stock market, means that investors must tread carefully in terms of investment.

According to Wijaya, Ihsan, and Solikhin (2012), investors will put their investments in the form of share purchases in banks with good reputations in order to obtain maximum returns. Therefore, each bank strives to maintain continuity and to enhance its business development in order to carry out its business activities continuously (Bangun & Wati, 2007).

Out of all the information and financial statements periodically issued by banks, investors generally pay attention to profitability, solvability, and dividend policy. This is because the level of returns received by investors depends on the level of profitability (profit), a company's ability to meet its long-term liabilities (solvability), and the dividend policy. The greater the appraisal value by investors, the higher the stock price. Thus, the value of the company itself increases (Bangun & Wati, 2007).

The value of the firm as seen through its market value is the market perception derived from investors, creditors, and other stakeholders of the firm's condition, which are reflected in the company's stock market value as a measure of its value (Wardjono, 2010). The market value can be measured using the *Price-to-Book Value (PBV) Ratio*. Research conducted by Bangun and Wati (2007) found that profitability significantly affected firm value, while the dividend policy did not significantly affect firm value. In contrast, Sambora, Handayani, and Rahayu (2014) found no significant effect of profitability on firm value. In addition, Sari (2013) found a positive and significant effect of dividend

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

policy on firm value. In terms of solvability, Rompas (2013) found that solvability significantly affects the value of state-owned enterprises.

The aim of this study is to examine the effect of profitability, solvability, and dividend policy simultaneously on firm value, particularly in the banking sector as listed on the Indonesian Stock Exchange for the 2012–2014 period using multiple linear regression.

The presentation of the study is divided into: literature review and hypothesis, methodology, results and discussion, as well as the conclusion and suggestions.

Literature Review and Hypothesis

This study is based on several theories and concepts related to the characteristics of firm value, profitability, solvability, and dividend policy.

Firm Value

According to Fuad, Christine, Nurlela, Sugiarto, and Paulus (2006), firm value represents the amount that prospective investors are willing to pay if a firm is sold. For publicly traded companies, the firm value indicator is the stock price traded on the stock exchanges. In other words, firm value is reflected in the stock's bargaining power. Thus, if a company is assessed to have prospects in the future, then the value of the shares will be high (Mardiyati, Ahmad, & Putri, 2012). High corporate value is desired by every shareholder as owners of the company, because high firm value indicates prosperity of owners (Nurhayati, 2013). Greater firm value, which is also shareholder value, shows that the public has assessed a stock market price above book value.

Profitability and Firm Value

Bangun and Wati (2007) defined profitability as the company's ability to generate income or profit in relation to total assets (ROA) and stockholders' equity (ROE). Profitability is an indicator of management performance in handling the company's assets as shown by the income generated through the sales and investments made by the company (Sudarmadji & Sularto, 2007). The greater the profits obtained, the greater the company's ability to pay its dividends and carry on its business (Nurhayati, 2013).

Profitability ratio is used to measure a company's ability to generate profits from business activities carried out, in order that investors can see how efficiently the company uses its assets in operations to generate profit. Profitability ratios are the end result of a number of policies and decisions made by the company (Mardiyati, Ahmad & Putri, 2012). In this study, the researcher used *Return on Equity* (ROE) and *Return on Assets* (ROA) as proxies for profitability.

Return on Equity (ROE) shows a company's ability to generate net income returns on shareholders' equity (Hermuningsih, 2013). Therefore, ROE reflects the wealth of shareholders or the firm's value (Handono, 2009). The larger the results of ROE, the better the performance. An improving ratio indicates increasing management performance in managing sources of operational funds effectively to generate net profits. ROE growth shows that a company's prospects are getting better as it indicates that potential increases in corporate profits exist. This is captured by investors as a positive signal from the company such that it will improve investor confidence and facilitate management to attract capital in the form of shares. When the demand for shares of a company increases, the price of such shares on capital markets will increase indirectly (Hermuningsih, 2013).

Return on Assets (ROA) represents the ability of a firm to generate net income from assets used in operations. Sugiono (2009) stated that ROA is used to measure the rate of return of the business of all its existing assets or—in other words—ROE describes the efficiency of assets used in the company. ROE growth can also increase investor confidence and stock prices.

Several studies using trade, service, and investment companies listed on the Jakarta Stock Exchange showed that profitability as measured by ROE significantly affects firm value as measured by PBV (Kontesa, 2015; Sucuahi & Cambarihan, 2016; Bangun & Wati, 2007). Other researchers also found the same results using the same measurement, namely ROE. Among others, this includes

research conducted by Hermuningsih (2013) on publicly listed companies on the Indonesian Stock Exchange for the 2006–2010 period, and research conducted by Mardiyati, Ahmad, and Putri (2012) on companies listed on the Indonesian Stock Exchange from 2005 up to 2010. On the contrary, research conducted by Sambora, Handayani, and Rahayu (2014)—as well as by Hirdinis (2019)—found that profitability as measured by ROE has no significant effect on firm value (PBV).

In addition, research conducted by Chen and Chen (2011) on companies listed in Taiwan for the 2005–2009 period found that profitability—as measured by return on assets (ROA)—significantly affected the value of the company as measured by closing stock prices.

The higher the profits earned by a firm, the higher the returns earned by investors. The assessment of investors is affected by the level of returns, such that a high appraisal on stock will lead to increased firm value (Bangun & Wati, 2007). High profits give an indication of good prospects, thus prompting investors to increase demand for stocks. Rising demand of stocks will then lead to the increase of firm value (Mardiyati, Ahmad, & Putri, 2012).

Solvability and Firm Value

Every company must have the financial resources needed to carry out its activities and to expand its business. However, the financial resources available are not necessarily sufficient. According to Herprasetyo (2009), to cover the shortage of financial resources, the sources of funds should be divided into two, external and internal sources. Internal funding sources come from within the company, such as a capital increase from owners and retained earnings. On the other hand, external sources include bank, third-party debt, and the issuance of securities to obtain resources from outside the company.

Solvability is the ability of the company to generate profits during a certain period to pay its debts, both short-term debt and long-term debt, while the company is well-run, as well as when it is going into liquidation (Brown & Gutterman, 2005). Ross, Waterfield and Jordan (2003) explained that the solvability of capital refers to the extent to which the company relies on debt. The more a company uses debt financing in its capital structure, the greater the level of solvability. Therefore, the selection of funding sources depends on the purpose, terms, benefits, and so forth, knowing that each funding source has its advantages and disadvantages. Assessing a company's ability to meet its obligations can be done by measuring:

1. the Debt to Assets Ratio (DAR), which measures how much of the company's assets is financed by debt, or how much debt affects the management of assets.
2. the Debt to Equity Ratio (DER), which is used to determine the amount of funds provided and owned by the company's owners. In other words, it determines the amount of owners' equity used to guarantee its debts.

Typically, a safe level of DER is less than 50%. The smaller the Debt to Equity Ratio, the better it is for the company (Fakhrudin & Hardianto, 2001; Kuswadi, 2006). Larger DER indicates that the capital structure includes more debt rather than capital, reflecting a relatively high level of company risk (Nataryah, 2000).

Anzlina and Rustam (2013) conducted research on real estate and property companies in Indonesia and found that DER had no effect on firm value, implying that any increase in DER would not be followed by an increase or decrease in firm value. The same result was also found by Fadhli (2015), who stated that DER does not have a significant influence on changes in the value of banking, insurance, or other financial institutions. The higher use of debt will provide benefits in the form of tax payment savings, and increases in profits per share to be received by shareholders. However, negative effects may also result from high levels of debt, such as default risk as a result of the high cost of interest and principal, which may exceed the benefits provided from debt so as to cause firm value to drop.

Research conducted by Rompas (2013) on state-owned non-bank companies listed on the Indonesia Stock Exchange concluded that DAR has a significant effect on firm value. Management

policy to increase debt leads to a high cost of capital to be borne by company operations. This may result in the reduction of corporate profits, and contribute to investors' consideration regarding whether their funds should remain invested in the company or be withdrawn, particularly if this policy may reduce a company's future earnings. If investors decide to withdraw their funds, then the price of existing shares in the capital market will be affected, and consequently, the company's value will decrease.

Dividend Policy and Firm Value

Dividend policy is an integral part of a company's funding decisions. Dividend policy is usually measured using the Dividend Payout Ratio (DPR). DPR shows the amount of profit which can be held in the company as a source of funding.

Dividend policy affects the assessment of investors regarding a company's merits because dividend policy affects stock prices (Mardiyati, Ahmad, & Putri, 2012). According to Weston and Brigham (2005), an optimal dividend policy will maximize a company's stock price.

Based on research conducted on companies listed on the Indonesian Stock Exchange from 2009 to 2011, Sari (2013) found that dividend policy as measured by DPR positively and significantly affected firm value. When greater dividends were distributed to shareholders or investors, a company's performance was considered better. Thus, firm value increased. Moreover, when a company established a higher dividend than in the previous year, higher returns were received by investors. This is what affected investors' appraisal. In addition, high investors' appraisal will result in the increased value of the firm (Bangun & Wati, 2007). Increasing dividend payments are a positive signal in regards to a company's prospects. As a result, investors will be interested in buying the stock, which then will increase firm value (Artini & Puspaningsih, 2011).

Several researchers such as Noerirawan and Muid (2012)—as well as Luh and Ni (2011)—also found the same result, implying that dividend policy as measured by DPR affects firm value positively and significantly. Nevertheless, other researchers such as Bangun and Wati (2007), as well as Mardiyati, Ahmad, and Putri (2012), found different results, suggesting that dividend policy has no significant effect on firm value.

Through simultaneous tests conducted by Bangun and Wati (2007), it was found that profitability and dividend policy simulatenously have a significant effect on firm value. Investor interest on the rate of return received is one determining factor for the increasing value of a firm. The rate of return received by investors depends on the level of profitability and dividend policy. Likewise, a high level of profitability indicates that the company's prospects are good as well, thus giving rise to demand for shares by investors. The positive response will increase stock prices, which then will ultimately increase the value of the company itself (Hermuningsih, 2013).

Similarly, when the company provides and establishes a higher dividend than in the previous year, the returns that will be received by investors will also be higher. The higher the returns, the higher the appraisal of investors regarding its stock price. As a result, there will be an increase in firm value (Bangun & Wati, 2007). Mardiyati, Ahmad, and Putri (2012) stated that simultaneously, profitability, debt policy, and dividend policy on manufacturing companies have a significant effect on firm value.

Methodology

The alternative hypothesis tested in this study related to the presence and absence of significant influence of the independent variables on the dependent variable and to determine which variables significantly affect firm value.

This study used the causal method to indicate whether the independent variables affected the dependent variable (Juliandi, Irfan, & Manurung, 2014), particularly to know whether profitability, solvability, and dividend policy affected the value of banking companies. The independent variables in this study included profitability, solvability, and dividend policy. Profitability was measured by ROE; the larger the results of ROE, the better the performance. An improving ratio indicated increasing

management performance in managing sources of operational funds effectively to generate net profit. In addition, this study also measured profitability with ROA. Moreover, solvability was measured by DAR and DER, while dividend policy was measured by DPR.

The dependent variable was firm value as measured by PBV. PBV measured how much the market valued the book value of a company's stock. A higher ratio indicated that the market is more confident regarding a firm's prospects (Sugiono, 2009). According to Wardjono (2010), a well-run company generally has a PBV ratio of above 1 (one)—that is, stock market value is greater than its book value. Table 1 shows how variables were measured.

Table 1. Measurement of Variables

Variable	Measurement
Dependent Variable	
Firm Value	$PBV = \frac{\text{Market Price per Share}}{\text{Book Value per Share}}$ $\text{Book Value per Share} = \frac{\text{Total Assets} - \text{Total Liabilities}}{\text{Number of Shares of Stock Outstanding}}$
Independent Variables	
Profitability	$ROE = \frac{\text{Net Income}}{\text{Total Equity}}$ $ROA = \frac{\text{Net Income}}{\text{Total Assets}}$
Solvability	$DER = \frac{\text{Debt}}{\text{Equity}} \times 100\%$ $DAR = \frac{\text{Debt}}{\text{Total Assets}} \times 100\%$
Dividend Policy	$DPR = \frac{\text{Dividends per Share}}{\text{Earnings per Share}}$

In sample selection, the researcher used a purposive sampling method. This method is a sampling technique that is based on judgment of certain criteria (Sugiyono, 2013). The criteria included publicly traded companies which had consistently published financial statements and had paid dividends for the 2012–2014 period.

Based on the stated criteria, the number of samples acquired were five companies. The list of companies used as sample is shown in Table 2.

Table 2. List of Publicly Traded Companies Included in Sample

No.	Code	Name
1.	BBNI	Bank Negara Indonesia (Persero) Tbk
2.	BBTN	Bank Tabungan Negara (Persero)
3.	BDMN	Bank Danamon Indonesia Tbk
4.	BMRI	Bank Mandiri (Persero) Tbk
5.	BNBA	Bank Bumi Arta Tbk

Source: Indonesian Stock Exchange

For data that did not meet the assumption test, the original data measurement scale was converted into another form using root transformation and logarithm. Through classical assumption test with normal analysis using Kolmogorov-Smirnov, the significant value was .88 > .05. Therefore, it can be concluded that the sample data used in this study was normally distributed. Furthermore, a

multicollinearity test was done, and it was found that all independent variables, ROE, ROA, DAR, DER, and DPR had tolerance values > 0.10 and VIF values < 10; thus, it can be inferred that no multicollinearity occurred. Through a Durbin-Watson test ($n = 15, x = 5, \alpha = .01$) = 1.96 < 2.04 < 2.04, no autocorrelation problem occurred in the regression model. In addition, a heteroscedasticity test using scatterplot test showed no clear pattern emerging, spreading above and below 0 on the Y-axis. Thus, it was concluded that no heteroscedasticity problem existed.

Results and Discussion

Based on Table 3, an *F*-test showed significance of $.001 < .05$. Further, ROE had a significant effect on firm value ($p < .01$), whereas ROA had a marginally significant negative effect on firm value ($p < .1$). DAR had significant and negative effect on firm value at $p < .05$. Nevertheless, DER had no significant effect on firm value. In addition, dividend policy had no significant effect on firm value.

Table 3. Simultaneous Tests of ROE, ROA, DER, DAR, and DPR on Firm Value (PBV)

Model	Unstandardized Coefficients		Standardized Coefficient	T	F	Sig
	B	Std. Error	B			
Constant	16.97	8.457		2.006		0.076
					12.48	0.001
ROE	6.90	1.17	1.23	5.91		0.000
ROA	-16.34	8.73	-0.45	-1.87		0.094
DAR	-4.40	1.75	-0.41	-2.51		0.033
DER	0.04	0.08	0.08	0.54		0.604
DPR	-0.50	0.98	-0.10	-0.50		0.627

a. Dependent Variable: Price to Book Value (PBV)

Adjusted R^2 value = .80 as shown in Table 4, signified that the amount of contribution from profitability, solvability, and dividends on firm value amounted to 80.4%, while the remaining 19.6% was influenced by other variables. The results of the study are in accordance with previous studies (Bangun & Wati, 2007; Mardiyati, Ahmad & Putri, 2012; Hasna, 2014; Chen & Chen, 2011, Moningka, 2013); however, they were in contrast to certain other studies (Sambora, Handayani & Rahayu, 2014; Daryanti & Bahar, 2010).

Table 4. Adjusted *R*-Squared Value

Model	Model Summary				
	R	R^2	Adjusted R^2	F-test	Sig.
1	.94	.87	.80	12.48	.001

Further, profitability as measured by ROE had a significant positive effect on firm value, with a level of $.000 < .05$, and unstandardized beta 6.899, which means that a one unit increase of ROE would increase the value of firm by 6.899.

The company's ability to generate net income for shareholder returns on equity attracts much investors attention. Investor interest regarding the rate of return is one of the determining factors for increasing firm value. The rate of return received by investors depends on the level of profitability (ROE). A high level of profitability indicates that a company has good prospects, which triggers demand for shares by investors. The positive response will increase stock prices, which ultimately will increase the value of the firm itself (Hermuningsih, 2013).

In addition, solvability, which is the ratio of debt to total assets (DAR), was found to have a significant negative effect on firm value, with a significant value of $.033 < .05$ and unstandardized beta

of -4.402. This implies that for each unit increase in DAR, there will be a 4.402 decrease in firm value. The ability of Indonesian banks to pay their debts as compared to their total assets showed a greater risk. This was in contrast to the results of Rompas (2013) on non-bank state-owned enterprises. A management policy of increasing debt results in high capital costs, which must be borne as part of conducting operations. This will result in the reduction of profits, and may cause investors to withdraw funds, which will then cause firm value to decline.

Dividend policy as measured by DPR had no significant effect on firm value. Dividend policy is often regarded as a signal in assessing the merits of a company. If a company decides to pay dividends in cash, then the company has lower funds to finance investment, which will exacerbate stock price woes. That is why companies should establish an optimal dividend policy (Sugiarto, 2011).

This study also found that profitability, as measured by ROA, did not show a significant effect on firm value. High profits may indicate an efficient use of assets and thus boost investors' demand for the stock. Nevertheless, data obtained still show very low efficiency in the use of assets (Mardiyati, Ahmad & Putri, 2012).

Conclusion

Investors who invest in the stock market, particularly in the Indonesian banking industry, generally consider firm value. The level of firm value depends on profitability and solvability, as well as the ability of companies to meet their short and long-term liabilities. The conclusions in this study are as follows:

1. When investors purchase banking shares, they observe a firm's value. Simultaneously, the model shows an adjusted R^2 value of 80.4%, implying that the remaining 19.6% is determined by other factors.
2. Profitability as measured by ROE has a highly significant and positive effect on firm value. In addition, ROA has a significant effect on firm value ($p < .10$) due to low efficiency in the use of assets. This implies that investors are interested in a company's ability to generate net income in regards to return on equity for shareholders. A high level of profitability indicates good company prospects.
3. Indonesian banks still rely on debt financing in their capital structures. The ability of Indonesian banking companies to pay debts compared to their assets show great risk. A high DAR will lower the value of a firm significantly.
4. Dividend policies of banking companies had no significant effects. Dividend policy was not considered as optimal.

Recommendations

This study did not measure other factors that may affect value of banking companies, such as corporate governance, liquidity, capitalization, and asset quality. By adding these factors, future research may make a larger contribution and input to the banking industry by paying more attention to these factors that may affect firm value. With increasing value, a company will experience substantial growth.

Further research is expected to increase the sample size, as the sample used in this study was small. In addition, further research is also expected to use profitability ratios such as net profit margin (NPM), operating expense/operating income (OEOI), as well as gross profit margin in measuring the impact of profitability on firm value. Similarly, to measure the impact of dividend policy on firm value, future research can use dividend yield and dividend per share as proxies. By using these additional ratios as mentioned, future research is expected to provide more accurate results in determining the effects of profitability, solvability, and dividend policy on firm value.

For the banking industry, and in particular publicly traded banks, in their efforts to increase firm value, companies should pay more attention to increasing profitability and solvability, as it was found that profitability and solvability have a significant effect in increasing firm value. When firm value increases, it is expected that investors will be attracted.

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An Overview of Karl Barth's Theology: Focused on the Doctrines of God, Jesus Christ, and the Holy Spirit

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Date Received: 6 November 2019 Revised: 20 January 2020 Accepted: 19 February 2020

Abstract

Karl Barth, the founder of neo-orthodoxy, is one of the most influential theologians in the modern Christian world. He has turned the direction of the stream of Protestant theology in the twentieth century. The purpose of this study was to give an overview of the theology of Karl Barth. This is useful in order to gain an accurate grasp of the trends in modern Christian theology. After a brief survey of his life and works, this study provides an overview of Barth's theology, focusing on three major areas of his theology: the doctrines of God, Jesus Christ, and the Holy Spirit. In order to give a better understanding of trends in modern Christian theology, Barth's emphasis upon the transcendence of God, the centrality of Jesus Christ in Christian theology, and the importance of the Holy Spirit in the Trinity cannot be ignored. In a word, Barth's theology has both a continuity with and a discontinuity from liberal theology at the same time.

Keywords: *Karl Barth, neo-orthodoxy, transcendence, Christology, Holy Spirit*

Introduction

Karl Barth (1886–1968) has generally been considered as one of the most outstanding Protestant theological thinkers of the twentieth century (Peerman & Marty, 1965, p. 396), and he could be called a modern "church father." Torrance (1962, p. 15), in his elaborate study of the theology of Karl Barth, says "it is acknowledged by many in all quarters that Barth must be accorded an honored position among the greatest theologians of the Church [such as] Athanasius, Augustine, Anselm, Aquinas, Luther, and Calvin." In this sense, Mueller (1972, p. 13) says, "Barth dominated much of the theology of the twentieth century and is the father of neo-reformation [neo-orthodox] theology." Thus, it can be said that Barth, the founder of neo-orthodox theology, was one of the most influential theologians in modern Christian theology. Neo-orthodox, also known as dialectical theology, is an approach to theology in Protestantism that was developed in the aftermath of the First World War (1914–1918). It is characterized as a reaction against doctrines of liberal theology in the nineteenth century. It is primarily associated with two Swiss theologians and pastors, Karl Barth (1886–1968) and Emil Brunner (1899–1966). Neo-orthodoxy was characterized by a return to modified forms of orthodox doctrines in contrast with the liberal desertion of such doctrines.

Neo-orthodoxy came to prominence in the wake of World War II. During the 1940s and 1950s, neo-orthodoxy realism was welcome by many in mainline Protestant denominations. As alternative to liberalism and fundamentalism, it offered a fresh means of hearing the Gospel (Reid, Linder, Shelley, & Stout, 1990).

Neo-orthodox theology emphasizes the transcendence of God, man's responsibility as a creature, sin and guilty, the uniqueness of Christ as mediator of revelation and grace, and speaks of a personal encounter with God in revelation (Brown, 1978). Barth has turned the direction of the stream of Protestant theology in the twentieth century.

Therefore, it is necessary to have an overview of Barth's theology in order to have an accurate grasp of the trend of modern Christian theology. In other words, having an overview of Barth's

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

theology, though not necessarily exhaustive, will help many students of theology not to have a poor grip of the development of contemporary Christian theology.

This study deals with three major areas of his theology: the doctrine of God, Jesus Christ, and the Holy Spirit.

Barth's Life and Works

In order to have an accurate overview of Barth's theology, it is necessary, as a background, to search and understand his personal life as well as his major theological works.

Barth's Life

Karl Barth was born in Basel, Switzerland, on May 1886. He was the eldest son of Johann Friedrich (Fritz) and Anna Katharina Barth. Both of Barth's grandfathers were ministers within the Swiss Reformed church. His father was an ordained minister and a professor of theology at a Reformed seminary, and moved to the University of Berne in 1889 as professor of Church History and New Testament Exegesis (Barth, 1966; Busch, 1976). This shows that Barth had grown up under the influence of the Reformed Church and its theological environment.

At the age of sixteen, Barth decided to become a theologian, and at the age of eighteen (in 1904), he began his study at the University of Berne, initially taking instruction from his father. In 1906, Barth came into contact with Adolf von Harnack, whose advocacy of "Liberal Theology" had a huge impact on Barth's thinking. In addition, he was much influenced by Wilhelm Herrmann.

After completing his studies in 1909, Barth was called to be a minister of the Reformed Church and accepted a posting first in Geneva in 1909, and then in Safenwil, located on the border that divided Switzerland and Germany in 1911 (Barth, 1966). Subsequently, he spent about ten years of his ministering and preaching life as a liberal Protestant, especially in harmony with von Harnack's teachings, rather than his father's.

According to his later memories, however, Barth came to reject liberal Protestantism, finding that it was not suitable to address the problems of his parish and useful for his personal journey. These thoughts came especially when he saw his theological teachers, such as von Harnack and other German theologians, reinforce the Kaiser's war policy in 1914. Hence, he became disillusioned with the theology of liberal Protestantism. Godsey (1928, pp. 21–22) said:

On what he [Barth] has called a 'black day' in August 1914, ninety-three German intellectuals impressed public opinion by their proclamation in support of the war policy of Kaiser Wilhelm II, and to his horror he [Barth] discovered that many of his former professors were among them. This convinced him that he could no longer follow them in their ethics, and therefore not in their theology.

Barth's treatments of his shifting views are shown in his maiden work, *Der Römerbrief* (Epistle to the Romans) which was published in 1919. In this theological commentary, he set forth the basic precepts for the theology of 'the Word of God' and 'the otherness of God.' In contrast to the liberal theology he was taught by Harnack and Hermann, Barth saw that, "the Gospel proclaims a God utterly distinct from men. Salvation comes to them from him [God], and because they are, as men, incapable of knowing him, they have no right to claim anything from him" (Barth, 1968, p. 28).

In 1913, while he was ministering in the village of Safenwil, Barth married Nelly Hoffmann, a talented violinist. Together, they had four sons and a daughter. Barth served as a church pastor until 1921, when he started his career as a professor.

In 1921, Barth became a professor of Reformed theology at the University of Göttingen (1921–1925). Afterward, he taught at the Universities of Münster (1925–1930) and Bonn (1930–1935) in Germany. While teaching at Bonn, he commenced to write a complete work of systematic theology based on God's Word with the title *Kirchliche Dogmatik* ("Church Dogmatics"). This was a thirteen-part work, which he continued to develop throughout his later life, but remained incomplete at his death on December 10, 1968.

In 1934, Barth was forced to leave Germany because of his outspokenness against the Nazi party. He returned to Basel (in 1935), where he taught theology until his retirement in 1962. After his retirement, Barth visited the U.S. and lectured at various places such as Princeton Theological Seminary, the University of Chicago, Union Theological Seminary, and the San Francisco Theological Seminary. Furthermore, he was invited as a guest at the Second Vatican Council. By 1962, Barth's influence was widespread. It reached out of academic and ecclesiastical circles and into mainstream American religious culture, as was demonstrated through him being featured on the cover of the April 20 issue of *Time*.

One matter that should be noted in an overview of Karl Barth's life is that his relationship to liberal theology was both crucial as well as ironic. Though influenced and trained by liberal theologians, Barth departed from his former training and eventually criticized liberal theology. He concluded that he could not accept an understanding of the Bible as characterized by liberal theologians due to their attempts to understand it through modern biblical criticism and historical criticism. He also opposed new doctrinal views that were taught regarding the Trinity and the Godhead. He accused these liberals of bringing God down from heaven and imprisoning Him in a naturalistic view of reality. This conflicted with Barth's view that God is the object of His own self-knowledge, and revelation in the Bible means the self-unveiling of God, who cannot be discovered by human beings. As a result, Barth evaluated liberalism as hopelessly compromised by worldly agendas and pastorally useless to the church. For Barth, liberalism rejected the supernatural essence of the Christian faith in order to accommodate erroneous anthropocentric explanations of divine realities.

Barth's Works

Barth's theology is central to the history of modern western Christian thought and remains as a major voice in contemporary Christian theology. His writings often have been the subject of intensive scrutiny and re-evaluation. The study of Barth's thought and theology is a significant enterprise. Literature on him and conferences devoted to his works abound. It would therefore be appropriate to say that Barth's works are significant resources for the understanding of modern contemporary Christian theology.

Barth's works, which are significant in modern contemporary Christian theology, include:

1. *Epistle to the Romans* (1919);
2. *Die Christliche Dogmatik in Entwurf [Church Dogmatics in Draft]* (1927);
3. *The Word of God and the Word of Man* (1928);
4. *Church Dogmatics* (1932);
5. *The Knowledge of God and the Service of God According to the Reformation* (1938);
6. 'No!' in *Natural Theology* (1946);
7. *Dogmatics in Outline* (1949);
8. *Anselm: Fides Quaerens Intellectum [Anselm's Proof of the Existence of God in the Context of His Theological Scheme]* (1960);
9. *The Humanity of God* (1961); and
10. *Evangelical Theology* (1963).

Among these works and other books, papers, and articles, two notable and influential ones should be mentioned in detail.

The first one is *Der Römerbrief* ("The Epistle to the Romans"), first written in 1919, and later thoroughly modified in 1922. This work is significant as it was Barth's first major work defined by his reaction against German Protestant Liberalism. Many theologians and historians consider the work to be the most important theological treatise of the twentieth century. In this theological commentary, Barth argued that God, who was revealed on the cross of Jesus, challenges and overthrows all attempts to ally God with human cultures, achievements, or possessions. God's saving grace and the insufficiency of the human understanding of God is emphasized in this work, along with many of his other works.

The second one of his most famous works is *Kirchliche Dogmatik* (“*Church Dogmatics*”). This thirteen-part work has been widely regarded as one of the most important theological works of the twentieth century. Barth published the first volume of *Church Dogmatics* in 1932 and continued working on it until his death in 1968. The pinnacle of Barth’s achievement as a theologian is clearly represented through this work. Barth’s theology finds its most sustained and compelling expression through this thirteen-part *magnum opus*.

The *Kirchliche Dogmatik* is divided into four main volumes: (1) the Doctrine of the Word of God; (2) the Doctrine of God; (3) the Doctrine of Creation; (4) and the Doctrine of Reconciliation. Barth initially also had intended to complete his *Church Dogmatics* addressing the Doctrine of Redemption, but has not completed the project until his death (Brown, 1978).^a

An Overview of Karl Barth’s Theology

The purpose of this paper is to give an overview of Barth’s theology.^b However, it is impossible to deal with all areas of his theology. Thus, this study tries to cover, though not exhaustively, only three major areas of his theology: the doctrines of God, Christ, and the Holy Spirit.

Doctrine of God

This section deals with Barth’s doctrine of God into three divisions: (1) the transcendent God; (2) the unknown God; and (3) the revelation of God in Jesus Christ.

1) The Transcendent God

One of the essential ideas of Barth’s doctrine of God is that he understood and emphasized the transcendence of God. According to Barth, God is “above us, above space and time, and above concepts and opinions and all potentialities” (Barth, 1960). In his first work, *The Epistle to the Romans*, Barth describes his understanding of the transcendence of God as follows:

God, the pure limit and pure beginning of all that we are, have, and do, standing over in infinite qualitative difference to man and all that is human, nowhere and never identical with that which we call God, experience, surmise, and pray to as God, the unconditioned Halt as opposed to all human rest, the yes in our no and the no in our yes, the first and last and as such unknown, but nowhere and never a magnitude amongst others in the medium know to us, God the Lord, the Creator and Redeemer . . . that is the living God (Barth, 1968, p. 315).

According to Barth, therefore, God can be perceived neither in the world of nature nor in the souls of human beings. There is no such point of context in human beings that they can reach to God. The distinction between God and human beings is too deep and wide for man to approach God. God is in the most noteworthy where human beings cannot reach Him unless He reveals Himself to human beings. In other words, there is an utter separation between the high God and the low world. In a word, God is the “wholly other” and human beings have no capacity for reaching God.

This concept of the transcendence of God is a natural result of Barth’s epistemology. For him, it is obvious that if God is “wholly other,” then there is no ontological nor epistemological basis for natural theology. The transcendence of God in his philosophical presupposition is the rejecting of the acknowledgement of natural theology, and opposition to the teaching of liberalism (or liberal theology). All modern ideas of the immanence of God are explicitly rejected by Barth’s epistemology on the transcendence of God.

2) The Unknown God

Barth makes it explicit from the beginning of his famous work, *Church Dogmatics*, that God is the unknowable and indescribable God (Barth, 1936). Simply, for Barth, God is the incomprehensible Reality. As he refers to the personality of God, Barth says, “God is personal, but personal in an incomprehensive way, in so far as the conception of his personality surpassed all our views of personality” (Barth, 1955, p. 31). In his comment on Romans 1:19–20, Barth once again emphasizes the incomprehensiveness of God as follows:

We know that God is He whom we do not know, and that our ignorance is precisely the problem and the source of our knowledge. The Epistle to the Romans is a revelation of the unknown God; God chooses to come to man, not man to God, for he [God] is ever the unknown God. In manifesting himself [God, Himself] to man he [God] is farther away than before (Barth, 1968, p. 48).

Therefore, Barth's assertion that God is unknowable is clear. He rejects natural theology, generally understood as knowledge of God, deduced from general revelation. He states, "We must be clear that whatever we say of God in such human concepts can never be more than an indication of Him; no such concept can really conceive the nature of God. God is inconceivable" (Barth, 1949, p. 46).

The mentioning of his philosophical presupposition seems adequate and necessary in order for one to understand the concept of the unknown God in Barth's theology. His basic presupposition is the limitations of fallen nature to come to a knowledge of God without God's self-revelation. For him, there is no such thing as a propositional truth given by prophetic revelation. It is implied in his theological framework that fallen human beings are incapable of knowing a transcendent, holy God. He uses the phrases "*finitum non capax infiniti*" (the finite has no capacity for the infinite) and "*peccator non capax Verbi divini*" (the sinner has not capacity for the divine word) (Barth, 1956).

3) The Revelation of God in Jesus Christ

As noticed in his two previous presuppositions of God, Barth must have believed that there is no way from man to God to find the transcendent and unknown God. However, according to Barth, there is a way from God to man through Jesus Christ that man could find and know God, "He who has seen Me has seen the Father" (John 14:9, NASB). Barth claims that Jesus Christ is the sole Word of God to human beings.

According to Barth, Jesus Christ is the Revelation of God, thus identifying revelation with Jesus Christ. He asserts that Jesus Christ is "the authentic Revealer of God as God Himself. Again, He is the effective proof of the power of God as God Himself. Yet again, He is the fulfiller of the covenant as Himself God. He is nothing less or other than God Himself, but God as man" (Barth, 1956). Thus, for Barth, human beings do not have the ability to know God apart from the revelation given through Jesus Christ. Barth asserts that Jesus Christ is the revelation of God, but he considers the Bible as a mere record of revelation, functioning as an authoritative pointer to revelation. According to Barth, the Bible is not the Word of God in the same sense that Jesus Christ is, but only contains the Word of God. He says, "The Bible is God's Word to the extent that God causes it to be His Word, to the extent that He speaks through it" (Barth, 1936, p. 241). For Barth, the Bible is one form of God's Word, not the primary, but a secondary source. He believed that the Bible becomes God's Word whenever God decides to use it to encounter and confront people with the gospel of Jesus Christ.

Barth's rejection of the inerrancy of the Bible comes from such views on the Bible. According to him, the Bible is a book of human testimony to Jesus, thus referring to the Bible as a human product. Hence, the statements of the Bible could be wrong at some point, but in spite of its humanness, the Bible is unique because God uses it. In his hermeneutical presupposition, the Bible itself is only a witness to revelation, not revelation itself.

Therefore, according to Barth, a satisfactory solution to problems raised by the transcendence of God and the incomprehensiveness of God can be found in Jesus Christ. In other words, it is only through Jesus Christ that the impossibilities are combined and the irreconcilables are reconciled (Barth, 1928; Barth, 1968). According to Barth, God has primarily revealed Himself in Jesus Christ, so that revelation does not take place through the form of general revelation in nature, history, and human conscience, or through special revelation in the Bible. Thus, Barth fails to do justice to the fact that God can influence humans through general revelation. In an extreme sense, to Barth, any revelation which is not "in Christ" becomes an idol by making competitive claims about the knowledge of God.

Doctrine of Christ

The theology of Barth is “Christo-centric” (Kantzer, 1958). It means, for Barth, that all Christian theology should find its central focus in Jesus Christ, and that all fullness of knowledge of God is obtainable only through Jesus Christ (Barth, 1958b). Barth holds that Jesus Christ, who is the Revelation of God, is the foundation of Christian theology and knowledge of God.

Regarding the relationship between the person and the work of Jesus Christ, Barth insists that the person of Jesus Christ cannot be considered separately from the work of Jesus Christ. In this sense, Barth follows the early church tradition.

In the early history of the church, the two [the person and the work of Jesus Christ] were held together in rather close connection. This approach changed during the medieval period, however. Scholastic theology separated the doctrine of the person of Christ (his divinity, humanity, and the union of the two) from the offices and work of Christ (Erickson, 1998, p. 692).

This means that the study of the person of Jesus Christ must be done in the context of the study of the work of Jesus Christ (Erickson, 1998). In the same way, he insists that the redemptive work of Jesus Christ was and is possible only because of who Jesus Christ is.

It is clear, in Barth’s Christology, that the true divinity of Jesus Christ is affirmed explicitly. Barth strongly believed that Jesus Christ is “very God of very God,” and possessed all the divine attributes during His earthly life, even as a baby born in Bethlehem, and even in His death on the cross of Calvary (Barth, 1936). At the same time, he also firmly believed the reality of the human nature of Jesus Christ. For him, the clear gospel record of the perfect humanity of Jesus Christ is enough to believe in the reality of His human nature. Essentially, Barth fully accepted the Nicene Creed and the later Chalcedonian formula, presenting two natures as united in the one person of Jesus Christ.

However, Barth’s understanding of the sinlessness of Jesus Christ is somewhat ambiguous. In his first work, he says that Jesus Christ is a “sinner among sinners” (Barth, 1968). His assertion that Jesus Christ took a sinful human nature is sharpened, but more ambiguous, in his *Church Dogmatics*. He asserts, “He [Jesus Christ] was not a sinful man. But inwardly and outwardly His situation was that of a sinful man.... He lived life in the form it must take on the basis and assumption of Adam’s act. He bore innocently what Adam and all of us in Adam have been guilty of” (Barth, 1956, pp. 151–152) Once again, Barth insists as follows:

The nature God assumed in Christ is identical with our nature as we see it in the light of the Fall. If it were otherwise, how could Christ be really like us? ... God's son not only assumed our nature but He entered the concrete form of our nature, under which we stand before God as damned and lost. He did not produce and establish this form differently from all of us; though innocent, He became guilty; though without sin, He was made to be sin. But these things must not cause us to detract from His complete solidarity with us and in that way to remove Him to a distance from us (Barth, 1956, p. 158).

At this juncture, it seems necessary to mention Barth’s view on the relationship of Jesus Christ, the living Word, to the Bible, the written word, and to the church, the proclaimed word. For Barth, God’s revelation to man through His word is communicated through three major mediums: Jesus Christ, the Bible, and the proclamations of the Church (Hart, 1999). On this relationship among the three, Barth is clear that Jesus Christ is the Lord of the Bible and the church. Jesus Christ is the only Lord; the Bible is not, neither is the church. The Bible could be said as having the authority in the church only in the sense that it is the primary witness to Jesus Christ. The church is the context in which the Bible is explained and Jesus Christ is proclaimed. For Barth, all of these three are divine revelations, but each of them centers upon Jesus Christ.

Doctrine of the Holy Spirit

Barth demonstrates a strong belief in the deity of the Holy Spirit (Barth, 1958a). He fully accepts the Nicene-Constantinople Creed, which, in the relation to the Holy Spirit, says, “1. We believe in the Holy Ghost, the Lord; 2. We believe in the Holy Ghost, the giver of life; 3. We believe in the Holy

Ghost, who proceedeth from the Father and the Son; [and] 4. We believe in the Holy Ghost 'who with the Father and the Son together is worshiped and glorified'" (Barth, 1936).

Barth also exhibits his belief in the Holy Spirit as the (1) Creator, (2) Reconciler, and (3) Redeemer (Barth, 1993). According to his *Church Dogmatics*, Barth sees that the Holy Spirit was and is with God the Father and the Son. He states, "The Holy Spirit is with the Father and the Son the true, eternal God in so far as, like begetting Father and the begotten Son" (Barth, 1958, p. 56a). In fact, Barth equalizes the Holy Spirit with God Himself:

In both the Old Testament and the New Testament the spirit of God, the Holy Spirit, is very generally God Himself to the degree that in an incomprehensibly real way, without on this account being and the less God, He can be present to the creature, and in virtue of this presence of His effect the relation of the creature to Himself, and in virtue of this relation to Himself grant the creature life. The creature needs the Creator to be able to live. It thus needs the relation to Him. But it cannot create this relation. God creates it by His own presence in the creature and therefore as a relation of Himself to Himself. The Spirit of God is God in His freedom to be present to the creature, and therefore to create this relation, and therefore to be the life of the creature (Barth, 1936, p. 450).

Regarding the role of the Holy Spirit, Barth not only views the Holy Spirit as the One who makes the union between God and humanity possible in Christ, but also as the gatherer of the believers as a community (Barth, 1958b), as well as the binder of the believers in Christ (Barth, 1958c). In relation to the event which is called revelation, Barth adds three dimensions of the work of the Holy Spirit. First, "the Spirit guarantees man what he cannot guarantee himself, his personal participation in revelation" (Barth, 1936, p. 453) Second, "the Spirit gives man instruction and guidance he cannot give himself" (p. 454) Third, "the Spirit is the great and only possibility in virtue of which men can speak of Christ in such a way that what they say is witness and that God's revelation in Christ thus achieves new actuality through it" (Barth, 1936).

Summary and Conclusions

As mentioned in the introduction, Karl Barth is generally considered as one of the most outstanding Protestant theological thinkers of the twentieth century. As the founder of neo-orthodoxy, he is one of the most influential theologians in contemporary Christian theology. Thus, it is essential to have an overview of Barth's theology in order to have an accurate grasp of the trend of modern Christian theology.

In the first section, as a background necessary for an understanding his theology, the study surveyed the life and the major works of Karl Barth. He was born under the context of the conservative Reformed Church tradition, but was educated under the influence of liberal theologians, such as Adolf von Harnack and Wilhelm Herrmann. However, through experiences of ministering for the local church, Barth found out the importance and the priority of the Bible in the theology and in the practice of Christianity. His two prominent works include (1) *The Epistle to the Romans*, his first publication, and (2) *Church Dogmatics*, his most famous work.

In the second section, this study discussed Barth's theology by trying to cover, not necessarily exhaustively, three major areas of his theology: The doctrine of God, Christ, and the Holy Spirit.

First, Barth understood God as the transcendent God and the unknown God. He also emphasized the revelation of God in Jesus Christ. For Barth, God is not the same God as understood by liberal theologians and the proponents of natural theology. Rather, God is the incomprehensible and unapproachable God by man himself. In this sense, there is a sharp contrast between Barth's theology and liberal theology.

Second, Barth's theology is Christ-centered. For Barth, all theology should find its focal center in Jesus Christ, as well as all knowledge of God is obtainable only through Jesus Christ. In other words, Jesus Christ, who is the Revelation of God, is the foundation of theology and the knowledge of God. Essentially, Barth's Christology is built upon the tradition of the Nicene-Constantinople Creed, and following in the Chalcedonian formula setting forth two natures united in the one person of Jesus Christ. However, Barth's understanding of the sinlessness of Jesus Christ seems somewhat ambiguous.

Regarding the relationship of Jesus Christ (the living Word) and to the Bible (the written word), and to the church (the proclaimed word), Barth is clear that Jesus Christ is the Lord of both the Bible and the church. All other elements of the divine revelation and even of theology should be centered upon Jesus Christ.

Third, Barth not only believes in the deity of the Holy Spirit, according to the Nicene-Constantinople Creed, but also places emphasis upon the Holy Spirit as the (1) Creator, (2) Reconciler, and (3) Redeemer. Barth's understanding of the importance of the Holy Spirit in the Trinity as well as his explanation of the work of the Holy Spirit is of significance for believers. He sees the Holy Spirit as gatherer of the believers as a community as well as the binder of the believers in Christ. In relation to the event which is called revelation, Barth adds three dimensions of the work of the Holy Spirit: The Holy Spirit (1) ensures man what he can't ensure himself, his personal participation in revelation; (2) gives man instruction and guidance he can't give himself; and (3) helps man to experience God's revelation in Jesus Christ.

In conclusion, Barth's theology has made a turning point in modern Christian theology. His theology was a kind of reaction against liberal theology, but, at the same time, his theology was not able to completely break free from the influence of liberal theology. In other words, Barth's theology has both a continuity with and a discontinuity from liberal theology at the same time. The emphasis on the transcendence of God and the centrality of Jesus Christ in Christian theology made by Karl Barth should not be ignored for a better understanding of modern Christian theology.

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Endnotes

^a The content of the *Church Dogmatics* is as follows: volume I/1 - the Word of God as the Criterion of Dogmatics; the Revelation of God; volume I/2 - the Revelation of God; Holy Scripture: the Proclamation of the Church; volume II/1 - the Knowledge of God; the Reality of God; volume II/2 - the Election of God; the Command of God; volume III/1 - the Work of Creation; volume III/2 - the Creature: volume III/3 - the Creator and His Creature; volume III/4 - the Command of God the Creator; volume IV/1 - the Subject-Matter and Problems of the Doctrine of Reconciliation; volume IV/2 - Jesus Christ, the Servant as Lord; volume IV/3/1 - Jesus Christ, the True Witness; volume IV/3/2 - Jesus Christ, the True Witness; volume IV/4 - the Foundation of Christian Life; and volume V - Index, With Aids for the Preacher (Brown, C. (1978). Barth, Karl. In J. D. Douglas (Ed.), *The new international dictionary of the Christian church*. Grand Rapids, MI: Zondervan (pp. 107–108).

^b For more understanding on Barth's theology, see the following references (Bromiley, G. W. (1979). *An Introduction to the theology of Karl Barth*. Grand Rapids, MI: Eerdmans; Busch, E. (2004). *The great passion: An introduction to Karl Barth's theology*. Grand Rapids, MI: Eerdmans; Hartwell, H. (1964). *The theology of Karl Barth*. Philadelphia, PA: Westminster Press).

Awareness and Practice of Standard Precautions for Infection Control among Student Nurses

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Date Received: 8 November 2019 Revised: 20 January 2020 Accepted: 2 February 2020

Abstract

Infection control knowledge is critical among healthcare providers. This study sought to determine the awareness and practice of standard precautions (handwashing, safe handling of needles and other sharp devices, and disposal of contaminated materials) for infection control among student nurses. Students ($N = 121$) were surveyed through purposive sampling. The awareness of the respondents was very high to excellent for practices involving handwashing along with proper handling and disposal of contaminated materials, with very good practice in the safe handling of sharps. There was a statistically significant positive relationship between awareness and practice in the handling and disposal of contaminated materials. However, no such relationship was shown with handwashing and safe handling of sharps. Year level and gender did not make any significant difference in safety practices. However, year level and gender were significant predictors of the practice of standard precautions for infection control in terms of safe handling of sharps, wherein students at higher training levels tended to have better practices. Awareness was a significant predictor of the practice of standard precautions involving proper handling and disposal of contaminated materials; the higher the awareness, the better was the practice. This study affirmed that awareness of standard precautions for infection control promoted better practice.

Keywords: *Standard precautions, awareness, infection control*

Introduction

Infection control should be observed by every nurse because non-compliance with standard precautions is associated with the spread of infection. According to Samson-Akpan and Bassey (2012), one of the major causes of morbidity in the clinical area is nosocomial infection. Healthcare-associated infections are grave problems in the healthcare sector that impose a great threat to patient safety (Hammoud, Ghazi, Nassredine, & Haidar, 2017). Nurses should have proper knowledge of infection control and should act according to standard precautions while giving care to patients. This provides an initial level of infection control. Previous studies have shown that student nurses can perform poorly when it comes to standard infection control, although they have good knowledge about the standard precautions (Barikani & Afaghi, 2012). Studies have been completed among staff nurses on practice and knowledge of standard precautions to control infection. However, there is dearth of literature and studies among nursing students.

The aim of the study was to determine the level of awareness and the extent of practice pertaining to standard precautions for infection control among nursing students, i.e., in terms of handwashing, safe handling of needles and other sharp devices, and proper handling and disposal of contaminated materials. Moreover, the relationship between awareness and infection control practice was investigated considering the year level of training and gender, as well as the predictors of infection control practices.

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

Literature Review

Awareness

Despite developments in health care systems, the risk of having hospital-acquired infection still exists. Nursing personnel possess a high risk of acquiring disease from patients and may possibly transmit infections to their patients. Having an awareness of standard precautions and practicing them has a vital role in preventing infection and reducing the risk of succumbing to hospital-acquired infections (Acharya, Khandekar, Sharma, Tilak, & Kataria, 2013; Kulkarni et al., 2016). Solutions to the growing problem of healthcare-associated infections and their impact on healthcare systems have relied greatly on infection control policies that have emphasized good hygiene. However, healthcare workers' must consistently follow these practices for the infection control strategies to be effective (Aboelela, Stone, & Larson, 2012). Nurses who have a high level of awareness regarding infection control tend to educate their patients and family members more about these practices compared to nurses with low awareness (Hammoud et al., 2017).

Iliyasu, Dayyab, Habib, Tihamiyu, Abubakar, Mijinyawa, and Habib (2016) argued that poor knowledge about the risk of transmission of blood borne pathogens meant under-estimation of the risk of transmission. This situation may put healthcare workers at risk of being infected with blood borne pathogens after exposure. Awareness is essential in health care and delivery systems, and helps the medical staff deliver care more effectively.

Practice of Standard Precaution for Infection Control

Standard precautions are a set of protocols for infection control practices. This set of protocols is used to prevent transmitting diseases that can be acquired by contact with non-intact skin and mucous membranes, blood, or body fluids. Even if the client or equipment/materials seem non-infectious, these infection control practice standards are needed in providing care to every individual (Wisconsin Department of Health Services, 2018).

Hamadah, Kharraz, Alshantqiy, AlFawaz, Eshaq, and Abu-Zaid (2015) argued that the compliance of all healthcare workers with universal standards on precautions for infection control was an effective tool in controlling and also in preventing the occurrence of hospital-acquired infections. Following these control precautions protects patients and also healthcare workers. It is essential to implement these processes and procedures to safeguard patients, care providers, and facilities.

Infections developed in hospitals or healthcare facilities can affect people of any age. These infections can worsen existing or underlying health conditions of clients, can delay their recovery, and can affect the quality of life. Healthcare-associated infections can occur not only among sick clients, but even among healthy individuals. This means that healthcare workers and family members are also at risk of acquiring health care-associated infections when caring for people. High standards of infection prevention and keeping the environment clean can help reduce the risk of healthcare associated infections (Mehta et al., 2014).

Three indicators of practice of standard precautions for infection control are included in this study, namely: (a) hand washing, (b) safe handling of needles and other sharp devices, and (c) proper handling and disposal of contaminated materials.

Hand Washing

According to Hamadah et al. (2015), hand washing is the most essential precautionary tool in reduction of nosocomial healthcare associated infections. Also, the Wisconsin Department of Health Services (2018) stated that hand washing should be performed before and after every interaction and process done in a facility. Hand washing should be performed every time there is a contact with the client, immediately after touching body fluids and blood, contact with contaminated items, immediately after removing gloves, when moving from contaminated body sites to clean body sites during client care, and after touching objects and medical equipment in the immediate client-care vicinity.

The importance of proper hand hygiene must be given emphasis in health-related curricula and healthcare facilities because improper hand washing may lead to patient's morbidity and mortality. The higher and wider the level of knowledge and awareness that nurses have regarding hand washing standards, the more precautions will be observed, and the greater will be the reduction in health associated infection rates (Hamadah et al., 2015).

Safe Handling of Needles and Other Sharp Devices

To prevent health care workers from being exposed to blood borne pathogens, safe handling of needles and other sharp devices is necessary (Wisconsin Department of Health Services, 2018). The US Needle Stick Safety and Prevention Act (Foley & Leyden, 2000) ordered the use of sharp items with engineered safety features if suitable devices existed and were available. Due to outbreaks of hepatitis B and C infections, healthcare facilities should re-emphasize safe injection practices. All healthcare personnel who give injections should strictly follow the Centers for Disease Control and Prevention (CDCP) recommendations—whenever a medication vial or IV bag is being retrieved, new needles and syringes should be used, every injection given to a client requires new needles and syringes, and only one client should be treated per medication vial as much as possible (CDCP, 2017).

Sharps must be in a container that is rigid, puncture resistant, closable, and leak proof—with a label that says sharps—and with the biohazard symbol. Sharps must be used with extreme caution. The clipping, breaking, and recapping of needles is discouraged. Containers for sharps should not be filled more than two-thirds full. If a container is filled with sharps, it must be closed securely and destroyed as medical waste by incineration (Hraishawi & Naji, 2015).

Proper Handling and Disposal of Contaminated Materials

The World Health Organization (2018) defined infectious waste as a contaminated waste if it included blood, infectious agents, waste from patients who were isolated, diagnostic samples that were discarded because they contained blood and body fluids, other contaminated materials such as swabs and bandages, and equipment such as disposable medical devices.

According to Burton (2017), items that can be a threat to cleaners and people who are handling waste disposal includes syringes and needles, scalpel blades, bandages, bedding, soiled clothing and sanitary waste products. When personnel are working in an environment with high risks, like a healthcare setting, they should consider, act and think that everything being handled is infectious. According to the World Health Organization (2018), generally, 85% of waste involving health care settings is non-hazardous, but 15% of the waste is possibly infectious. This waste material may contain organisms that are harmful, and it may affect other patients, staff and the general public.

Methodology

This study utilized a quantitative descriptive-evaluative, descriptive-comparative, and descriptive-correlational research design.

Population and Sampling

Data were collected from 121 nursing students who were in their second, third and fourth years, selected through purposive sampling, from a nursing school in Cavite, Philippines. Out of the 121, 49 were males and 72 were females; 39 were in their second year, 39 were in their third year, and 43 were in their fourth year. Those who had clinical experience or practice aside from what is required in the nursing curriculum were excluded from the study.

Questionnaire

The survey questionnaire included three parts. The first part involved demographic profiles of the respondents. The second part consisted of questions on awareness of standard precautions for infection control adapted from the study of Samson-Akpan and Basse (2012). Some items were modified on the basis of reliability to the target population and relevant literature. Each item was

scored on a five-point Likert scale (strongly disagree, disagree, neither agree nor disagree, agree and strongly agree). The final section contained questions to evaluate the practice of standard precautions for infection control that included handwashing, safe handling of needles and other sharp devices, and proper handling and disposal of contaminated materials. The questions were adapted from the study of Tufail, Afzal, Perveen, Waqas, and Gilani (2017), with some modifications to fit the respondents and related literature. Responses were measured using a five-point Likert scale (never, rarely, sometimes, most of the time, and always). The survey questionnaire was tested for reliability and content validation by five experts who were nurse educators and clinical practitioners who held masters and doctoral degrees in nursing.

Analysis of Data

The Statistical Package for Social Sciences (SPSS) Version 22 was used for analysis. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the demographic profiles of respondents, the level of awareness, and the extent of practice. Pearson product-moment correlation was used to determine the relationship between awareness and practice of standard precautions for infection control. Analysis of variance was used to determine differences in practice when gender and year level were considered. Further, linear regression was used to determine the predictors of practice of standard precautions for infection control.

Ethical Considerations

Approval was secured from the institution where the study was conducted, and from the institution's Ethics Review Committee. The students were given a detailed explanation about the nature and the purpose of the study. It was emphasized that participation was voluntary, and that participation in the study would have no influence on either their coursework grade or clinical requirements. Informed verbal consent was secured and all data sheets were kept confidential and anonymous.

Results

Level of Awareness on Standard Precautions for Infection Control

Table 1 shows that the level of awareness was Very High.

Table 1. Level of Awareness of the Respondents

Feature Investigated	Mean	SD	Qualitative Descriptor
Used needles and sharps should be disposed of in sharp containers.	4.84	0.59	Very High
Disinfection of instruments should be done after each contact with patients.	4.80	0.57	Very High
Gloves should be used to handle contaminated materials.	4.83	0.57	Very High
Needle injuries should be reported to authority.	4.70	0.65	Very High
Hands should be washed before and after procedures.	4.88	0.45	Very High
Hands should be washed before and after each patient care.	4.86	0.46	Very High
Precautionary measures prevent HIV/AIDS and Hepatitis B.	4.69	0.62	Very High
Awareness	4.80	0.45	Very High

Legend: 1.00–1.49 = Very Low, 1.50–2.49 = Low, 2.50–3.49 = Fair, 3.50–4.49 = High, 4.50–5.00 = Very High

Handwashing Awareness

Table 2 indicates that the practice of standard precautions for infection control in terms of handwashing had an overall mean score of 4.54, which was Excellent.

Table 2. Extent of Practice on Standard Precautions for Infection Control in Terms of Handwashing

Feature Investigated	Mean	SD	Qualitative Descriptor
I wash my hands before and after each procedure for 1 minute.	4.29	0.82	Very Good
I wash my hands with soap under running water.	4.64	0.72	Excellent
I wash my hands before and after donning of gloves.	4.60	0.69	Excellent
I wash my hands above the elbow.	3.93	1.08	Very Good
I wash my hands before and after invasive procedures.	4.87	0.39	Excellent
I wash my hands after touching patient's surroundings.	4.57	0.72	Excellent
I wash my hands when I come in contact with patient's blood, bloody fluids, and secretions.	4.91	0.29	Excellent
Handwashing	4.54	0.45	Excellent

Legend: 1.00–1.49 = Poor; 1.50–2.49 = Fair; 2.50–3.49 = Good; 3.50–4.49 = Very Good; 4.50–5.00 = Excellent

Safe Handling of Needles and Other Sharp Devices

Table 3 shows that the practice on standard precautions for infection control in terms of safe handling of needles and other sharp devices had an overall mean score of 3.91, which is interpreted as Very Good. Using new needles for each injection of a client received the highest score, while the lowest score was recorded for recapping needles before disposing of them. This practice received a score of 1.63 and was interpreted as fair.

Table 3. Extent of Practice in Terms of Safe Handling of Needles and Other Sharp Devices

Feature Investigated	Mean	SD	Qualitative Descriptor
I use a separate syringe for aspirating different vials.	4.80	0.52	Excellent
I recap needles before disposing of them.	1.63	1.15	Fair
I use a new needle for each injection of a client.	4.89	0.35	Excellent
I reuse syringes for the same client.	3.98	1.50	Very Good
I use the same needle for aspirating different vials.	3.76	1.61	Very Good
I use a separate needle for aspirating different vials.	4.39	1.15	Very Good
Sharps	3.91	0.56	Very Good

Legend: 1.00–1.49 = Poor; 1.50–2.49 = Fair; 2.50–3.49 = Good; 3.50–4.49 = Very Good; 4.50–5.00 = Excellent

Proper Handling and Disposal of Contaminated Materials

Table 4 (please see following page) shows that the practice on standard precautions for infection control in terms of proper handling and disposal of contaminated materials was Excellent, with an overall mean score of 4.85.

Table 4. Extent of Practice in Terms of Proper Handling and Disposal of Contaminated Materials

Feature Investigated	Mean	SD	Qualitative Descriptor
I wear gloves when handling soiled linens and clothing.	4.70	0.67	Excellent
I dispose of the following in a designated bin for infectious waste material:			
a. Used dressings	4.94	0.23	Excellent
b. Used gloves	4.93	0.28	Excellent
c. Used masks	4.87	0.46	Excellent
d. Used needles	4.78	0.83	Excellent
e. Used syringes	4.88	0.55	Excellent
Disposal	4.85	0.32	Excellent

Legend: 1.00–1.49 = Poor; 1.50–2.49 = Fair; 2.50–3.49 = Good; 3.50–4.49 = Very Good; 4.50–5.00 = Excellent

Awareness and Practice on Standard Precautions for Infection Control

Table 5 figures show that there was no significant relationship between awareness and practice on standard precautions for infection control among student nurses in terms of handwashing and safe handling of needles and other sharp devices. However, there was a significant relationship ($r = .18$; $p \leq .05$) between awareness and practice in terms of proper handling and disposal of contaminated materials.

Table 5. Relationship between Awareness and Practice on Standard Precautions for Infection Control

Feature Investigated	Awareness		Qualitative Descriptor
	<i>r</i>	<i>p</i>	
Handwashing	.14	.115	Not Significant
Sharps	.02	.796	Not Significant
Disposal	.18	.044	Significant

Precautions for Infection Control Influenced by Year Level and Gender

There were no significant differences in the practice of standard precautions for infection control among student nurses when year level was considered. Trends suggested that differences might be observed among the years in a larger study. When gender was considered, there also were no significant differences in the practice of standard precautions for infection control among student nurses regarding handwashing, safe handling of needles and other sharp devices, and proper handling and disposal of contaminated materials.

Predictors for Safe Practices

Among the variables (Awareness, Year Level, Gender), there was no predictor of standard precautions for infection control in terms of handwashing. Year level and gender were significant predictors of safe handling of needles and other sharp devices (Table 6). Together they explained 6.8% of the variance in practices on needles and sharps, of which 3.4% can be explained by each variable.

Table 6. Predictors on Practice in Terms of Safe Handling of Needles and other Sharp Devices

Predictors	<i>R</i> ² Change	UC		SC		<i>t</i>	<i>p</i>
		<i>B</i>	<i>SE</i>	β			
(Constant)		3.24	.24			13.67	.000
Year Level	.034	0.16	.06	.229		2.51	.013
Gender	.034	0.22	.11	.190		2.08	.040

$$R = .26, R^2 = .07, F = 4.33, p = .015$$

$$\text{Equation for Practice on Needles and Sharps} = 3.24 + .16\text{Year Level} + .22\text{Gender}$$

Awareness was a predictor for proper handling and disposal of contaminated materials (Table 7).

Table 7. Predictors on Practice in Terms of Proper Handling and Disposal of Contaminated Materials

Predictors	<i>R</i> ² Change	UC		SC	<i>t</i>	<i>p</i>
		<i>B</i>	<i>SE</i>	<i>β</i>		
(Constant)		4.23	.31		13.69	.000
Awareness	.03	0.13	.06	.18	2.03	.044

R = .18, *F* = 4.13, *p* = .044

Equation for Practice on Proper Handling and Disposal of Contaminated Materials = 4.23 + .13Awareness

Discussion

The results revealed that nursing students studied were very aware of standard precautions for infection control. This may be due to the fact that the respondents were already exposed to clinical practice as required in the nursing curriculum, with the concepts previously learned in class. According to Hammoud et al. (2017), nurses who have high awareness of infection control tend to educate their patients and the family members about these practices. In addition, Ilyasu et al. (2016) mentioned that poor knowledge about transmission of blood-borne pathogens could increase these risks, which may put health care workers at risk of being infected with these pathogens following exposure.

Further, the results indicated that the respondents had excellent handwashing practice in the clinical area. This could be on account of the students being aware of the standard precautions for infection control through knowledge gained in class and in the clinical area. Handwashing is considered very important and one of the most effective and economical method to prevent infection. It is necessary for nurses and patients to wash hands to prevent the spread of microorganisms.

The results also revealed that the respondents displayed very good practices in terms of safe handling of needles and other sharp devices. The knowledge gained by students in the classroom may have contributed to this outcome. All healthcare personnel who give injections should strictly follow to the CDCP recommendations—safe injection practices, which include the following: use of a new needle and syringe every time a medication vial or IV bag is accessed, use of a new needle and syringe with each injection of a client, and use of medication vials for one client only (CDCP, 2017).

Moreover, the respondents had excellent practices in regards to proper handling and disposal of contaminated materials. This might also be an outcome of knowledge gained in class.

The results showed that there was no significant relationship between awareness and practices in terms of handwashing and safe handling of needles and other sharp devices. However, there was a significant relationship between awareness and practices in terms of proper handling and disposal of contaminated materials. Having the knowledge and awareness about standard precautions and practicing them plays a vital role in preventing infections (Acharya et al., 2013). The study by Lee, Park, and Jo (2017) on awareness and performance of standard precaution guidelines—designed to prevent medical-related infections—showed that awareness of infection control was positively correlated with performance of standard precautions.

Hamadah et al.'s (2015) study confirmed that compliance of healthcare workers to universally agreed standards on infection control precautions is an effective tool in controlling and preventing possible occurrence of hospital-acquired infections for patients and healthcare workers. Our results did not show differences among student training levels in the practice of handwashing, proper handling and disposal of contaminated materials, and safe handling and disposing of contaminated materials. This contrasts with the study done by Luo, He, Zhou, and Luo (2010). They showed that student nurses at higher levels of training had greater compliance than those who had received lower levels of exposure.

Year training level and gender were predictors of practices in safe handling of needles and other sharp devices. Further, females tended to have better practices than males. Suliman (2018) concurred that higher education can make a difference in patient safety in many situations. Nurses in

their final year naturally have undertaken more courses, been exposed to more concepts, and had more experience in infection control practices than those in the lower years.

Moreover, awareness is a predictor of proper handling and disposal of contaminated materials. Awareness positively influenced practices of handling and disposal, which implies that those with high awareness are more likely to have better handling and disposal practices. According to Mathur, Dwivedi, and Misra (2012), education is a critical element in the training of all health care workers. Emphasis should be given in training regarding biomedical waste management that will make an impact on practices of appropriate waste disposal. Furthermore, according to these authors, adequate knowledge about the health hazards of hospital waste, proper techniques and methods of handling the waste, and practice of safety measures would be a great help to protect healthcare workers and community members from various adverse effects of hazardous waste.

Conclusions

The study concluded that the nursing students under study were aware of and practice standard precautions for infection control in respect to handwashing, proper handling and disposal of contaminated materials, and safe handling of needles and other sharp devices. The higher the awareness of the students, the better their practical application of safety procedures. Females tended to have better habits of safe handling of needles and other sharp devices than males.

Limitations

Variables such as years of clinical practice, clinical area specialty, and clinical exposure may be explored in future studies in different nursing schools, and among registered nurses in the clinical area. Sampling different demographic profiles and the use a larger sample size would be beneficial. The survey tool used may not have been sufficient to measure the actual awareness and practice variables, because it was totally dependent on the honesty of respondents in answering the questions; thus, another tool might be tested in future investigations. A qualitative study also might be done to gain a deeper understanding of the phenomenon, and to explore what additional factors might contribute to better practice of infection control.

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Knowledge, Attitudes, and Practices of Records Management among Bank Professionals: A Basis for a Competency Training Program

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Date Received: 8 November 2019 Revised: 27 January 2020 Accepted: 20 February 2020

Abstract

This study was undertaken to determine the relationship of variables on records management practices. The population surveyed, through purposive sampling, consisted of 74 professionals from selected banks in Santa Rosa, Laguna, Philippines. Questionnaires were used to examine the relationships of the moderating variables used. These were age, gender, marital status, educational qualifications, and length of service. Descriptive statistics were used to measure the knowledge, attitudes, and practices of the respondents on records management. The statistical techniques applied to data were Pearson correlation analysis, two-tailed independent samples *t*-test, and analysis of variance. The respondents' level on knowledge was *high*, and they had a *positive* attitude towards the records management practices. A *high* level was attained on records management practices. Knowledge and attitudes had a significant positive effect on practices implemented concerning records management. Attitude had predictive ability on practices adopted in records management. Practices on records management were not influenced by age, marital status, educational qualifications, and length of service, but gender did influence management outcomes significantly.

Keywords: *Knowledge, attitude, practices, records management*

Introduction

One of the most striking changes that has impacted today's office professionals is the expanse of knowledge required for success. Office professionals must understand and be able to manage records and information from creation to preservation and disposition (Brereton, 2016; Franks, 2013).

Managing records involves more than collecting and keeping data and information. It also concerns the knowledge of what records must be kept, where they are to be stored, how they are to be managed, and who has the right of access. Records are created daily and organizations must ensure that these records can be used as evidence to support transactions to keep the business viable (Unegbu, 2013).

The significance of record keeping and management might be illustrated by reference to the higher education sector in Ghana. Lack of record management has caused damage to the country's entire education sector. Personnel in-charge of the maintenance of the registry system were ignorant of their responsibilities. It has caused the reliability and authenticity of the records in the system to be questionable (Seniwoliba, Mahama, & Abilla, 2017).

Such findings encouraged the researchers to conduct an investigation on the knowledge, attitude and practices of professionals in records management. The main purpose of this study was to determine the following: (a) knowledge, attitude and practices on record management among office professionals, (b) relationships among variables, (c) significant difference on records management practices considering respondent profiles, and (d) a proposed competency training program.

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

Review of Literature

Records Management

In defining records management, the concept of records needs to be known. It is defined in terms of its physical format or in the information it contains (Tagbator, Adzido, & Agbanu, 2015). In the book, *Record Management Handbook*, Penn, Pennix, and Coulson (2016) defined records management as “the management of any information captured in reproducible form that is required for conducting business.”

Records play a major role in establishing the stages of development, implementation, monitoring, evaluation and renewal of an institution’s programs which, overall, are crucial information that is involved in the survival of the institution. The premise of why records need management is the same as questioning why other resources require management. In institutions of higher learning, it is important to regard records as being at the heart of successful institutional operations (Seniwoliba, Mahama, & Abilla, 2017).

In state run organizations, the public relies heavily on records. In fact, record keeping helps maintain and uphold the operation of a democratic society by keeping the government accountable. Thus, record keeping is crucial to normal day to day business operations (Ondieki, 2017)

The International Organization for Standardization (2001) defined records management as the field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use and disposition of records, including the process for capturing and maintain evidence of and information about business activities and transactions of records.

Knowledge

Knowledge is the awareness of, or familiarity with, various objects, events, ideas, or ways of doing things (Henriques, 2013). According to a Corporate Storage Services document, as cited in Unegbu (2013), records management concerns record keeping, but it also involves knowledge on how records are to be managed.

In different parts of the world, records management varies in terms of the nature and extent depending on its purpose, setting and context of the services. The employees have to be knowledgeable and familiar with the requirements needed in managing records, such as the level of confidentiality, proper maintenance security, preservation of content, and other necessities that are to be considered (Seniwoliba, Mahama, & Abilla, 2017).

In the control of records management, staff development is an essential tool in building awareness and knowledge of records management and its significance in service delivery. The objective is for knowledge to generate effectiveness in an organization’s day-to-day operation. Without control, records have the potential to raise operating costs and expose organizations to risk unnecessarily (DeBenedetti, 2018; Musumbe, 2016).

The knowledge dimension of record management includes benefits, confidentiality, findability, and safety. The benefits in recordkeeping and management are simple processes that give a framework for the keeping, maintenance, and provision for the disposition of all records and anything cited on them. Records are there for the purpose of benefiting the staff of institutions in facilitating continuous and elevating services while preserving privacy. In turn, such frameworks are managed under a set of guidelines meant to educate the staff on decisions for professional record keeping (Seniwoliba, Mahama, & Abilla, 2017).

The Oxford Dictionary defines findability as the ‘quality or fact of being findable.’ Read and Ginn (2016) stated in their book *Records Management* that a record loses its value at the time when it is needed but cannot be located. The system an organization uses must make it possible for any person to be able to locate files quickly. It is crucial to have the ability to find the records, regardless of the form in which they may be.

Attitudes

Attitudes play a great role in records management. According to ISO 15489, every person involved in the business has a part in the recordkeeping system by ensuring that the records are created and captured. It is vital for every employee to recognize their responsibilities in this respect (Oliver & Foscarini, 2014).

Upholding accurate records and maintaining an up-to-date system for filing are both important jobs for administrative assistants. Each and every filing system that has been made requires an operator who will maintain the system with pride. The operator should also have a great amount of confidence that any file asked for can be retrieved as quickly as possible (Stroman, Wilson, & Wauson, 2014).

Bad record keeping and lack of policy guidelines in records management programs have led to inefficiency in administration and to the loss or unavailability of vital information needed for decision-making (Unegbu, 2013).

For more effective record management, managers of records and information should know how the organization works, which in turn would allow better chances of identification and provision of intellectual and physical control of the records created. To ensure that staff show a proper and effective compliance, management needs to be aware of the responsibilities of managing records and the systems used and the procedures adopted (Franks, 2013; Luthuli & Kalusopa, 2017).

Practices

Record management, though a vital part in any institution, is commonly underestimated until the time a needed record cannot be located. Record management is the practice of proper maintenance or records of organizations and institutions, from the time of the foundations of the creation of the institution, to the time deemed for their disposal. It is an essential component of office administration. An effective record management program allows the organization to render better customer service, provide legal defensibility, and leads to improved profitability (Betty, 2018; Unegbu, 2013).

The importance of records management is increasingly being recognized in organizations. It is therefore the responsibility of records managers to ensure that they gain the attention of decision-makers in their organizations (Tagbotor, Adzido, & Agbanu, 2015).

The American National Standards Institute cooperated with the International Organization for Standardization in creating ISO 15489. It is a set of standards for records management policies and procedures, and it guarantees the purpose of ensuring the applications of appropriate attention and protection to all records so that evidence and information they contain can be retrieved efficiently and effectively (Read & Ginn, 2016).

Creation. In the Philippines, the National Archives refers to the creation of records as the organization's way of transmitting ideas between two sources in a written form, the ability to control records and retain them in a record keeping system, and the making of records to provide evidence of administrative activities (Official Gazette, 2009).

Records should be created and collected to meet operational, policy, legal and financial purposes. Document accuracy and adequacy permits government functions, policies, procedures, decisions and transactions to serve as reliable evidence. The creation of records should be adequate but not excessive. They should be created or kept in the most suitable medium and format. In particular, records that are known to have permanent value should be created in a format that will permit such records to be preserved. Records are created to document actions and decisions as soon as possible in order to ensure that the reliability and completeness of records will not be adversely affected due to the passage of time (Government Records Service, 2018)

Use. The ultimate reason why records are created is that someone will require the information in the future. The prime objectives of records keeping is to appraise, arrange, describe, and preserve information so as to enhance future information use (Sundqvist, 2015).

Yeo (2005) indicated that studies of how records have been used have been mainly focused on how staff and employees access and look into records. There is a clear need to understand the users' needs when it comes to records. This is frequently not known. The diversity of needs requires careful study and considerable effort is required in order to satisfy interested users.

Maintenance. In the Oxford Dictionary, the term maintenance is spoken of as the process of preserving or keeping something in good condition. Maintenance has the objective of preserving the condition of records so that they may be of use and function as needed through their life cycle. Maintenance is an important part to ensure functionality, eco-efficiency, and in extending the life time of records. Thus, the term 'life cycle maintenance' is used to stress the role of life cycle management (Takata et al., 2004)

Disposition. Disposal has been termed and defined as destruction of public documents or information in public documents. This involves destroying information entirely, but also includes the partial loss of information via transfers through alternative media. Proper disposal practices are there to insure there is proper space saving with no chance of losing vital information. Thus, before destroying or disposing of any information, the importance of such documents or information must be established (Tersmeden, 2018).

Erasing, deleting, and destroying are the different ways to dispose of records from their holding medium. Destruction is recorded in a digital format to account for its disposal. Meanwhile, electronic records are reviewed by authorized employees to ensure which documents are to be sent for storage in the form of microfilms, tapes, disks, and other storage devices (Rajan, 2013).

Theoretical Framework

Records Continuum. The records continuum provides a way of making sense of the complexity of record keeping in our digital environment. The four dimensions (creation, use, maintenance and disposition) and the four axes (record keeping containers, evidentiality, transactionality, and identity) can be used as a practical tool to identify the stage of development an organization has reached in terms of managing its information as evidence for accountability (Oliver & Foscarini, 2014).

The concept of the records continuum is a consistent and coherent process through the lifecycle of records. It implies that the four actions continue or recur through-out the records' lifecycle. According to the Standards Association of Australia, the records continuum is "a consistent and coherent regime of management processes from the time of the creation of records, through to the preservation and use of records as archives" (Seniwoliba et al., 2017).

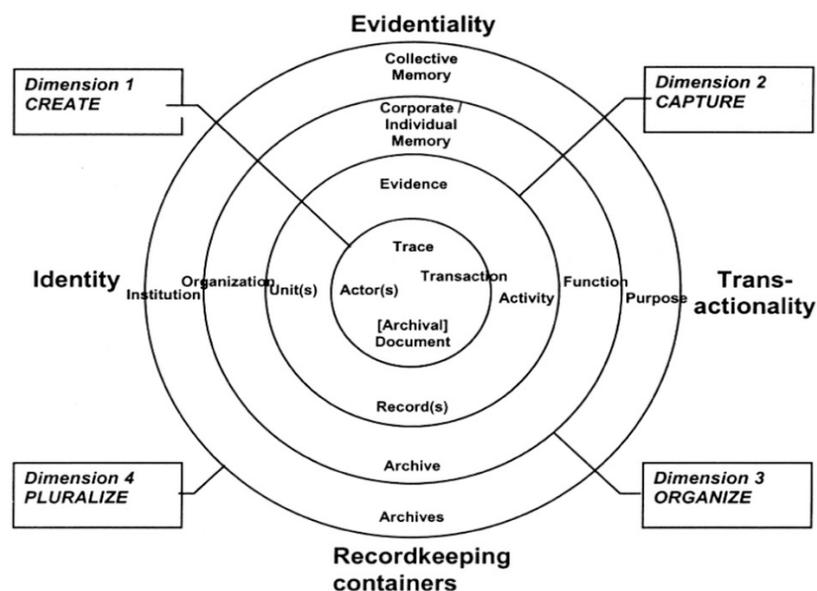


Figure 1. Records Continuum Model

The records continuum model was formulated by an Australian archivist named Frank Upward. He based his formulation on four principles which are: (a) “The concept of record inclusive of records of continuing value (archives) stresses their use for transactional, evidentiary, and memory purposes and unifies approaches to archives/recordkeeping, whether records are kept for a split second or a millennium; (b) “There is a focus on records as logical rather than physical entities, regardless of whether they are in paper or electronic form; (c) “Institutionalization of the recordkeeping profession’s role requires a particular emphasis on the need to integrate recordkeeping in business and societal processes”; and lastly (d) “Archival science is the foundation for organizing knowledge about recordkeeping. Such knowledge is revisable but can be structured and explored in terms of the operation of principles for action in the past, the present and the future.” The model gives importance to the overlapping characteristics of recordkeeping. Unlike the records lifecycle, which deemphasizes the time-bound stages, the records continuum merges the recordkeeping and archiving processes into the time space dimensions (Franks, 2013).

Data Privacy Act of 2012

The Republic Act of 10173 (2011), also known as the Data Privacy Act of 2012, seeks to minimize data privacy in the Philippines. This Act states that “although the free flow of information promotes innovation and growth, it is essential that personal data in the government and private sector’s information and communication systems are to be secured and protected at all times” (Palabrica, 2012).

The Implementing Rules and Regulations of Republic Act No. 10173, took effect in the year 2016. This law was passed hopefully to protect the fundamental human right of privacy while ensuring there was a free flow of information. This Act has raised the definition of what data privacy should be, such as the protection of information and balancing the free flow of information by controlling and integrating its responsible use by any organization.

Methodology

The respondents of this descriptive-correlational study were 60 professionals chosen purposively from 11 banks in Sta. Rosa, Laguna, whose jobs involved the creation, use, maintenance and disposition of records in their offices. Out of 77 respondents, 37 (48.1%) belonged to the group 21–30 years old, 24 (31.2%) belonged to the group 31–40 years old, 16 (20.7%) belonged to the group 40 years old and above. The majority of the respondents were female (54 or 70.1%), had taken vocational courses (73 or 94.8%), married (51.9%) and single (45.5%) and had worked for up to five years (44.2%), 6–15 years (41.6%), and 16 years and above (14.3%).

The self-constructed survey-type used in this study was divided into four parts. The first part dealt with the respondents' demographic profile such as their age, educational qualifications, marital status, and length of service. The second part consisted of 15 items that measured the respondents' knowledge about record management based on four dimensions. The response options were 'true' or 'false.' The knowledge scores were converted to intervals as follows: 1–3 (*Very low*); 4–6 (*Low*), 7–9 (*Average*), 10–12 (*High*), 13–15 (*Very High*). The third part consisted of 10 items that measured the attitudes of professionals on records management. The scale utilized a four-point Likert scale of *Strongly Disagree* (1), *Disagree* (2), *Agree* (3), and *Strongly Agree* (4). These numbers corresponded to a verbal interpretation of *Highly Negative*, *Negative*, *Positive*, and *Highly Positive*, respectively. The last part measured the practice on records management. It consists of parts with four subcategories such as creation, use, maintenance, and disposal. The response choices were 'never,' 'rarely,' 'sometimes,' 'oftentimes' and 'always,' interpreted as *Very low*, *Low*, *Average*, *High*, *Very High*, respectively.

Descriptive statistics, such as frequency, percentage, mean, and standard deviation were used to describe the demographic profile of the respondents. Pearson correlation, *t*-test and ANOVA were also used in the study.

Results

Knowledge on Records Management

Table 1 shows that the respondents were highly knowledgeable in records management (mean = 12.07, *SD* = 2.34) with a total score of 15. Most of the respondents (98.4%) answered item 4 correctly, which means that they clearly knew that records have an important impact in the efficiency and economical operations of all organizations. Ninety-seven percent (97%) answered item 1 correctly which implies that the respondents believe that the assurance of privacy of their company is achieved through managing records. Item 8 was correctly answered by ninety-six (96%) of the population, which shows that most of the respondents are aware of the use of data security when it comes to the prevention of cases where data could possibly leak. On item 14, only 52.2% answered it correctly by believing the Republic Act #10173 is only for the government sector, while a large number believed the opposite.

Table 1. Knowledge on Records Management

Items Considered in the Questionnaire		Correct answers (%)
4	Records have an important aspect for the efficient and economic operations of all organizations	98.7
1	Managed records give assurance of privacy for the institution	97.0
8	Data security comes into action to prevent cases such as leaking of valuable information	96.0
2	Valuing information requires the determination of what is private, confidential, or restricted	94.7
5	Computer crime awareness is important for the organization to avoid huge amount of damage	94.7
12	Records management is a great asset to the organization when maintained in a systematic fashion	93.4
10	Records are used as references for making important decisions	92.0
15	Record management is the supervision and administration of digital or paper records regardless of form	90.7
3	A lost record will not cost the organization as it still can be replaced	82.2
9	An envelope or folder is only used if the record contains sensitive information	74.7
7	Cross referencing is not a necessary step in filing records	72.2
11	Indexing is done only when the record being filed is highly valuable	67.1
13	Discussion of sensitive information among the staff will cause no damage to the organization as long as it is kept as a secret	62.2
6	Organizing records alphabetically is the only way to manage records	61.8
14	The Republic Act # 10173 is an act protecting individual information and communication systems in the government sector only	52.2
Grand Mean of Knowledge		Mean = 12.07, <i>SD</i> = 2.34
		Verbal Interpretation <i>High</i>

Attitudes Regarding Records Management

Table 2 shows the possession of a *positive* attitude regarding records management (Mean = 3.21). The respondents strongly agreed (mean = 3.60) that they felt that their work would be easier when records were managed properly. In addition, respondents (mean = 3.56) *strongly agreed* that a records management system was of great importance in the workplace. In item 1, the respondents *agreed* (mean = 3.46) that they felt that records management was given importance in their workplace. The rest of all items are presented in Table 2.

Table 2. Attitudes Regarding Records Management

	Items Considered in the Questionnaire	Mean	SD	Scaled Response	Verbal Interpretation
9	I feel that proper record management can make office work easy	3.60	0.79	Strongly Agree	Highly Positive
8	It is important to have a record management system in the workplace	3.56	0.86	Strongly Agree	Highly Positive
1	I feel that records management is not important in our workplace	3.46	0.96	Agree	Positive
2	I feel that we are very efficient in managing records	3.33	0.74	Agree	Positive
7	I feel that I can manage my records properly	3.32	0.70	Agree	Positive
10	The thought of losing important records frightens me	3.27	0.90	Agree	Positive
6	I feel that it's important to give customers the records that they need	2.97	0.97	Agree	Positive
3	I feel responsible whenever a record gets lost	2.92	0.95	Agree	Positive
4	I am confident to find any file even if it is not organized	2.89	0.96	Agree	Positive
5	There is no possibility of losing any records in my office as long as I remember its creation	2.62	0.95	Agree	Positive
	Grand Mean of Attitude	3.21	0.46	Agree	Positive

Legend: 3.50–4.00 = Strongly Agree (*Highly Positive*), 2.50–3.49 = Agree (*Positive*), 1.50–2.49 = Disagree (*Negative*), 1.00–1.49 = Strongly Disagree (*Highly Negative*)

Practices on Records Management

Practice is the way a person is able to apply or use an idea, thought or the things learned. Records management was measured in terms of creation, use, maintenance, and disposal. Table 3 (following page) shows observations for the dimension of *creation* which had an over-all mean of 3.83, which shows that the respondents oftentimes practice the creation of management records. This means that they were *highly* practiced in this function.

The first *highly* practiced item among others was, “Whenever I make a record, I always proofread the whole document before I print it.” It returned a mean of 4.28. On the other hand, the item “I entrust someone else to manage our records in the office” was sometimes practiced by the respondents in a borderline satisfactory manner (mean = 2.69).

Use is an important part of a records life cycle. Detailed data are not shown on account of the high values obtained. The results of the respondents’ answers to practices related to use on records management returned a mean of 3.94 (*SD* = 0.69), which was interpreted as *highly* practiced. The single question that received an average response was “I track records by writing the names of those who accessed it.”

Maintenance is the act of preserving certain things. The over-all results for this section were interpreted as *high*, (mean = 4.18, *SD* = 0.718), which indicates that the respondents maintain their records in a good manner. This also shows that their company practiced good maintenance when keeping their records.

Table 3. Practices Related to Creation

	Items Considered in the Questionnaire	Mean	SD	Sealed Response	Verbal Interpretation
1	Whenever I make a record, I always proofread the whole document before I print it	4.28	0.89	Oftentimes	High
2	I immediately document officially approved decisions	4.25	0.91	Oftentimes	High
4	I routinely collect the records to ensure it has fulfilled its purpose	4.00	0.80	Oftentimes	High
5	I backup my documents right after I finish making them	3.88	0.98	Oftentimes	High
3	I entrust someone else to manage our records in the office	2.69	1.13	Sometimes	Average
Grand Mean of Creation		3.83	0.64	Oftentimes	High

Legend: 4.50–5.00 = Always (*Very High*), 3.50–4.49 Oftentimes (*High*), 2.50–3.49 = Sometimes (*Average*) 1.50–2.49 = Rarely (*Low*), 1.00–1.49 = Never (*Very Low*)

Disposal of records helps the company maintain proper storage of old records and new records. The respondents surveyed in this study disposed of records at the appropriate time by following a retention schedule in their workplace. Disposal of records management returned a mean of 3.89 ($SD = 0.749$). Respondents oftentimes evaluated records to know which were to be disposed of and make sure government guidelines were followed. Disposal could involve storing records in digital form in case they were needed in the future.

Relationship of Knowledge, Attitudes and Practices on Records Management

Analysis indicated that knowledge and attitude showed a positive relationship with the Pearson correlation giving a value of .383 ($p = .001$). This means that as professionals learn more about records management their approach to it will also become better.

Table 4. Relationship between Knowledge, Attitudes and Practices of Records Management

		K	A	P	C	U	M	D
Knowledge	<i>r</i>	1	.38**	.35**	.29*	.28*	.38**	.25*
	Sig. (2-tailed)		.001	.002	.012	.017	.001	.029
	<i>N</i>	76	76	75	75	75	75	75
Attitudes	<i>r</i>	.38**	1	.49**	.37**	.39**	.52**	.42**
	Sig. (2-tailed)	.001		.000	.001	.001	.000	.000
	<i>N</i>	76	76	75	75	75	75	75
Practices	<i>r</i>	.35**	.49**	1	.84**	.88**	.87**	.85**
	Sig. (2-tailed)	.002	.000		.000	.000	.000	.000
	<i>N</i>	75	75	76	76	76	76	76

Legend: K – Knowledge A-Attitude P-Practices C-Creation U-Use M-Maintenance D-Disposal

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

The relationship between knowledge and practices was significant at the 1% level. This implies that if professionals are more knowledgeable about the theories and methods of records management, the level of their practice will increase in a way that will make them more efficient in the office.

Attitude and practices on records management were also significantly ($p = .000$) related to each other that implies that as professionals show a more positive approach to the practice of records management, there will be an increase in productivity in their office.

Difference in Practices of Records Management

Comparison of the practice on records management by age showed no significant difference ($F(2,73) = 0.18, p = 0.837$). However, the record management practices were significantly different between male and female, with females returning superior outcomes ($t = -2.58, p = .012$). No significant differences were noted in the practice of records management when marital status, educational background, and length of services were compared ($p > .05$).

Predictors of Practices Related to Records Management

Predictors refer to factors that significantly contribute to records management practices. Only the variable *attitude* was considered to significantly predict practices of professionals related to records management. Table 5 summarizes the results of the regression model for the predictors of practice on records management.

Table 5. Predictors of Practice on Records Management

Predictors	Unstandardized Coefficients		Standardized Coefficients	R	R ²	R ² Change	T	Sig.
	B	Std. Error	Beta					
(Constant)	1.83	.44	-	-	-	-	4.14	.000
Attitude	0.66	.14	.49	.49 ^a	.24	.24	4.84	.000

The results of the linear regression model were significant, attitudes significantly predict practices ($p = .000$). The results imply that 24.3% (R^2 Change = .24) of the variance of the attitudes contributes to the practice of records management. This means that positive attitude will lead an increase of acceptable practices in records management.

Discussion

This study aimed to assess the respondent's knowledge, attitude, and practices on records management. Findings showed that many of the respondents had *high* knowledge on records management. Attitude towards records management was *positive*. The practices on records management were also revealed to be *positive*. Responsibilities of employees in records management involved maintenance of existing files, but also designing and installing a records system. Factors such as findability, confidentiality, and safety are to be considered in the making of an effective records system. The results also revealed that gender was a moderating variable affecting the practices on records management. Age, marital status, educational qualifications, and length of service did not affect professionals' practices on records management.

It has been observed that practices involving poor management could likely lead to the loss of all corporate memory, which are records that document the development of functions and provide data for research. Improper approaches to record keeping will result in the records being misplaced or destroyed in an untimely manner. Although some materials may be left, their value as evidence may still mean nothing (Tagbotor, Adzido, & Agbanu, 2015).

The findings of this study showed that knowledge was significantly related with practices on records management. Corporate records management concerns not only record keeping, but also knowledge on how records are to be managed. An employee's outlook on records and records management are manifested in certain attitudes and behaviors, such as usage in records management systems, preparation in applying the record management policy, voluntarily practicing records management procedures, readiness in setting up personal systems to support personalized work-

related information needs, and willing participation in record management training programs (Oliver & Foscarini, 2014; Read & Ginn, 2016).

Perhaps not surprisingly, attitude and practices were significantly related in the present study. It was found that 24.3% of variance in records management could be attributed to the attitudes held, indicating that much more work is required to identify other influential contributors to variance.

According to Arena Solutions (2019), the major element of quality management, compliance, and regulatory practices and employee safety is the training of records management. Records management is not often given notice, however, without the proper training record management automation; manufacturers are prone to compliance challenges and unnecessary administrative costs. Based on our results it also seems evident that educational records management programs would be most beneficial if they were run with an emphasis on enhancing knowledge, particularly attitudes towards the practices of records management. The competency training program might include a review on the definition of records, their importance, and the reasons why they should be managed efficiently. The provision of case reports dealing with the consequences of poor corporate management practices needs to be passed on to all those involved in record keeping.

In our fast-changing world, there is a need for all companies to train employees in advanced operating procedures as they incorporate new technologies, meet new challenges, and encompass new practices. Whether the company is required to comply with the FDA, ISO or any other standards, training ideally should be done.

Conclusions

Effective records management retains documentation on the development of functions in organizations and facilitates future research. The misplacing of records needs to be carefully guarded against and records should be destroyed only after careful consideration. Training is surely necessary to ensure a thorough understanding of, and compliance with, new methods of data storage and changing procedures within an organization.

This study identified the factors that affect the practices on records management among banking professionals in the Sta. Rosa, Laguna region. While the respondents' level on knowledge was high and they had a positive attitude towards the practices on records management, there was room for improvement. Knowledge and attitudes affected the practices on records management among the professionals that worked in the selected organizations. An increase in knowledge and a positive attitude could lead to an improvement in the practices on managing records.

Gender also made a significant difference in the practices on records management of the professionals studied. According to the findings, females received a higher score in comparison with the male population in terms of exemplary records management. Since attitude best predicts the practices of records management among professionals, a positive attitude such as being responsible, being confident in their work, and being aware of and open-minded to the changes that take place in their office is beneficial. The primary indication arising from the study is the need for educational records management programs with an emphasis on enhancing knowledge of and attitudes toward the practices relevant to records management.

Recommendations

1. Office professionals should update their current knowledge regarding records keeping and filing systems and keep abreast with current trends, especially in the fast-changing world transitioning to the digital age.
2. Seminars/workshops should be made available for the instructors of record management.
3. Ensure that records management topics are integrated into the course syllabi of Office Management programs.
4. Research might be conducted to evaluate an organization's records management system to determine what factors are most likely to make the operation more efficient and economical.

- Investigations might be conducted to identify other variables affecting current practices on records management. The aim should be to improve efficiency and at the same time support data privacy acts.

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The Effects of Using Particulate Diagrams on High School Students' Conceptual Understanding of Stoichiometry

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Date Received: 6 November 2019 Revised: 16 February 2020 Accepted: 19 February 2020

Abstract

The lack of a conceptual understanding of stoichiometry among high school students is a valid concern because it impedes students' problem-solving ability, which is a significant predictor of performance in college chemistry. In this study the effects of a visual-based pedagogical approach was investigated on the understanding of four concepts of stoichiometry among tenth-grade chemistry students at an international high school in Thailand. The approach involves the systematic use of particulate diagrams in the instruction of stoichiometry in a real classroom setting. The study further examined the attitudes of the students towards the approach. Conducted using a one-group pre-test/post-test design, data for the study were collected using a conceptual stoichiometry test and an attitude questionnaire. Analyses of the test data indicated that the approach had a significantly positive effect on the students' conceptual understanding of stoichiometry, and they generally had a favorable attitude towards it.

Keywords: *Stoichiometry, conceptual understanding, particulate diagrams, pedagogical model*

Introduction

Stoichiometry problem-solving can pose challenges to high school chemistry students. From an analysis of student responses at Adventist International Mission School (AIMS), Muak Lek, Thailand to a variety of stoichiometric questions, it was noted that the primary source of these challenges was students' minimal or complete lack of conceptual understanding of stoichiometry. AIMS students appeared to have misconceptions regarding some stoichiometry concepts, including the concepts of mole, representative particles, mole ratio, theoretical yield, and limiting reagent. Their inadequate understanding of these concepts impeded their ability to solve stoichiometry problems successfully. Although studies have shown that the use of particle diagrams can effectively improve students' conceptual understanding of stoichiometry, this visual tool has not been applied systematically and extensively in AIMS chemistry classes, and its impact specifically on AIMS students' conceptual understanding of stoichiometry had not been explored.

Purpose of the Study

The purpose of this study was to investigate the effects of using particle diagrams (also called particulate diagrams) on AIMS high school students' conceptual understanding of stoichiometry, specifically on the concepts of representative particles, mole ratio, limiting reagent, and theoretical yield. In this study, a companion booklet entitled "Thinking the Particulate Way!" was designed and used as complementary material in lessons related to concepts of stoichiometry. At the end of the series of lessons, its effects on students' conceptual understanding of stoichiometry and their attitudes towards its use in learning stoichiometry were examined.

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

Literature Review

Stoichiometry

Stoichiometry is a branch of chemistry that deals with calculations of the quantities of substances involved in chemical changes or chemical reactions (Wilbraham, Staley, Matta, & Waterman 2017). The word *stoichiometry* is derived from the Greek words: *stoicheion* (meaning “element”) and *metron* (meaning “to measure”) (Goldberg, 2015). Though the translation from Greek to English seems to imply that only chemical elements are involved and measured, very often chemical compounds are involved and measured in chemical reactions.

Stoichiometry calculations deal with the quantities of chemical elements, or compounds present, before undergoing a chemical change (reactants), and the chemical elements or compounds produced after the chemical change (products). These quantities are measured in terms of mass, volume, number of moles, and number of representative particles.

Both students and teachers find stoichiometry to be one of the most challenging topics in chemistry. Evaluation of senior secondary school chemistry syllabi indicates that students and teachers find the module on stoichiometry problematic (Seetso & Taiwo, 2005; Shadreck & Enunuwe, 2018). Even after alternative approaches for teaching stoichiometry are developed, students and teachers may still regard the topic as being complicated and unmotivating (Fach, Boer, & Parchmann, 2007). Interviews with high school chemistry instructors revealed responses that were overwhelmingly similar, in that they found teaching stoichiometry challenging. Students' reactions toward learning about the concepts of stoichiometry were ones of fear and apprehension (Bridges, 2015) and discouragement (Schmidt & Jignéus, 2003).

Dahsah and Coll (2007) reported that even after major national curriculum reforms, Thai Grade 10 and 11 students who participated in a survey demonstrated less than the acceptable level of understanding concepts related to stoichiometry. The Thai students' responses also suggested that they resorted to the use of algorithms with little knowledge of the underlying concepts. Findings from a study involving 867 twelfth-grade Indonesian students showed that, in general, Indonesian students were more successful in answering questions that were algorithmically based, and found no strong positive correlations between student performance on conceptual questions and algorithmic questions (Agung & Schwartz, 2007). These studies suggest that students who do not grasp the chemistry concepts behind a problem sufficiently tend to use algorithmic methods. They merely use a memorized formula, manipulate the equation, and plug numbers in it until they fit.

What makes stoichiometry so challenging to learn and understand is that the macroscopic features of chemical reactions, on which stoichiometry is primarily based, are emergent properties resulting from actions at the atomic or molecular levels (Cheng & Gilbert, 2014). These submicroscopic actions operate on a non-human scale and are unable to be directly manipulated or experienced. Therefore, developing an intuition for connecting these macroscopic features with submicroscopic interactions is difficult (Rahayu & Kita, 2009). Still another learning challenge is mastery of the representational system of symbols, formulas, equations, and mathematical manipulations used to describe and explain these unseen submicroscopic interactions that give rise to macroscopic features. Expert chemists move freely among these three levels as they pursue their work, including that of instruction (Johnstone, 2000). However, students, whose knowledge framework is rudimentary at best, have great difficulty understanding their teachers when explanations move away from the macroscopic level with which they have everyday experience. Effective stoichiometric instruction should promote student development of cognitive connections among macroscopic, submicroscopic, and representational aspects of stoichiometry.

Bridges (2015, p. 9) suggested that teachers need to be “knowledgeable, creative, and resourceful” in helping their students to learn stoichiometry. In recent years a number of alternative approaches for teaching this unit of chemistry have been developed. In Germany, a set of stepped supporting tools was implemented to help grade 9 students working on stoichiometric problems (Fach, Boer, & Parchmann, 2007). A study of 96 Indonesian students reported that macro–submicro–symbolic teaching, which employed multiple representations, could enhance student mental models

and understanding of chemical reactions effectively, which is the basis for solving stoichiometric problems (Sunyono, Yuanita, & Ibrahim, 2015). Inquiry-based lessons, using particulate level models, may produce statistically significant improvement in grade 11 and 12 students' conceptual understanding of stoichiometry, even though there are variations in the intervention delivery (Kimberlin & Yeziarski, 2016). An instructional model that incorporates definitions, computer-generated visuals at the submicroscopic level, and physical samples of various substances at the macroscopic level seems to improve students' conceptions of pure substances and mixtures (Sanger, 2000). These studies suggest that an understanding of the submicroscopic composition of chemical elements and/or compounds that make up the reacting and resulting substances in chemical reactions is an essential prerequisite to interpreting and solving stoichiometric problems.

The studies cited above indicate that a more visual pedagogical approach to teaching stoichiometry effectively could advance student conceptual understanding. Consequently, the Advanced Placement Chemistry curriculum was redesigned to include learning objectives that contain references to particulate representations of chemical phenomena (College Board, 2014). However, the shift in emphasis toward conceptual understanding using particulate images presents a real challenge for many chemistry teachers, because most of them have had limited exposure to particulate ideas before teaching chemistry, including during their high school years. Therefore, translating the recommendations for using particulate representations into teaching practices can be a daunting task. The scarcity of classroom-ready lessons or supplementary materials based primarily on particulate descriptions further compounds the challenge. From my own experience as a chemistry teacher, I observed that in high school chemistry textbooks, particle diagrams were used sparingly and sporadically as concept illustrations and as summative assessment items. Very few chemistry textbooks make extensive use of particle representations, and they are not accessible by all teachers. In their action research, Kimberlin and Yeziarski (2016) designed and provided evidence for the effectiveness of two particulate level inquiry-based lessons. Unfortunately, these lessons could not be accessed online. Without classroom-ready and easily accessible materials, recommendations to incorporate particulate ideas in stoichiometry lessons create gaps in the literature.

Particle Diagrams

A particle diagram is a model that usually describes the arrangement and movement of particles in a substance. The particles are represented as circles that are either drawn individually or in groups of two or more, depending on what substance they constitute. In most science lessons, the diagram is used to explain the physical properties of solids, liquids, and gases. However, in stoichiometry, it is used to show the composition of substances involved in chemical reactions. It shows the number and types of particles that make up the reactants and products in chemical reactions. Examples of particle diagrams representing an element, a compound, and a mixture are shown below.

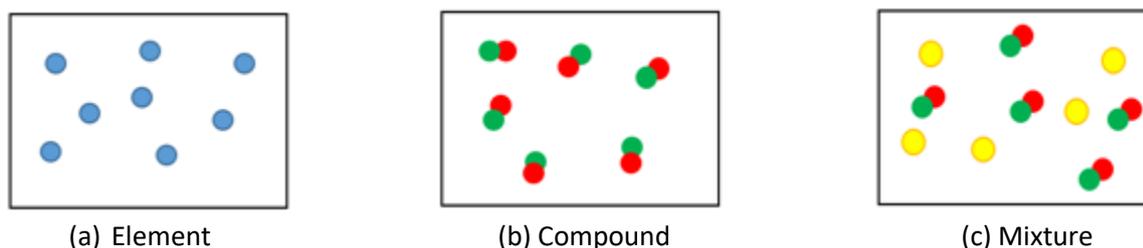


Figure 1. Examples of Particle Diagrams

Methodology

Research Questions

The following questions were used as guides in the study.

Research Question 1: To what extent does the use of particle diagrams affect students' conceptual understanding of representative particles, mole ratio, limiting reagent, and theoretical yield?

Research Question 2. What are the students' attitudes towards the use of particle diagrams?

Research Design

The study employed a one-group pre-test post-test design (or paired-sample design). This design involved measuring conceptual understanding of stoichiometry in one group of students (grade 10) once before the treatment was implemented (pre-test), and once after it was implemented (post-test). Conclusions about the treatment's effects were formulated based on the difference between the pre-test and post-test data.

This design was adopted for several important reasons. First, this design allowed the study to be done in a real classroom setting, within a single class without having to separate students, and during school hours without disrupting the smooth running of any classes or school programs. Second, the treatment itself could be easily incorporated into the chemistry lessons without compromising real learning time for the students. A third reason was that the researcher had no control over the number of students who enrolled in General Chemistry class, and since the number was small (13 students), it was more feasible to adopt a one-group design.

Treatment Conditions

The treatment engaged students in simple, non-intrusive activities compiled in a booklet entitled *Thinking the Particulate Way*. The booklet contains 54 particle diagrams (also called particulate diagrams, or submicroscopic diagrams) related to topics and concepts of stoichiometry. The method of instruction for the stoichiometry unit traditionally included the interactive lecture method, modeling problem-solving, peer coaching, laboratory activities, and a very minimal use of particulate diagrams drawn on the whiteboard and shown on PowerPoint slides. In this treatment-added approach, the same strategies were used, but with the integration of information and exercises contained in the *Thinking the Particulate Way* booklet wherever and whenever they were relevant in the lessons. This booklet provided supplementary materials that allowed students ample opportunities to examine the submicroscopic basis of concepts related to stoichiometry, specifically the concepts of representative particles, mole ratio, limiting reagent, and theoretical yield.

The booklet was divided into four sections. Each section included a topic and one stoichiometry concept that was related to the study.

Population and Sample

The sample for this study was thirteen 10th grade students who enrolled in the General Chemistry class for the academic year 2018–19 at AIMS. The sample was selected using a non-random, convenience sampling technique. The researcher sampled 13 tenth-grade chemistry students who were conveniently available and happened to be her students at the time of the study. With this sampling technique, it was not possible to specify the target population from which this sample was drawn. However, generalizability was not a concern because the interest was only in discovering the effects of a pedagogical approach on a specific group of individuals at AIMS to whom the results were relevant.

Instrumentation: Conceptual Stoichiometry Test (CST) Pre-test and Post-test

To determine the effects of the use of particle diagrams on students' conceptual understanding of stoichiometry, an improved version of a published instrument, called the Conceptual

Stoichiometry Test (CST), was used. It was designed by Wood and Breyfogle (2006) and improved by Kimberly and Yeziarski (2016). Stoichiometric concepts addressed and measured by the 10-item test were: a) Representative Particles, b) Mole Ratio, c) Limiting Reagent, and d) Theoretical Yield.

The CST test was piloted with nine Grade 10 students enrolled in Physical Science class at AIMS. Apart from question reorganization, there was no need to change other aspects of the test after the pilot test.

Attitudes Towards the Use of Particle Diagrams Questionnaire

A 10-item Attitude towards Use of Particle Diagrams (ATPD) questionnaire was administered to students at the end of the stoichiometry unit to determine their attitudes to the use of particle diagrams, and whether or not these diagrams helped them understand stoichiometric concepts. The researcher developed the 12-item questionnaire. Each item was rated on a Likert scale using five response categories: Strongly Agree, Agree, Not Sure, Disagree, and Strongly Disagree.

A pilot study was carried out for the questionnaire in which 10 twelfth-grade students were the respondents. The results suggested that no changes were necessary in the questionnaire.

Data Collection and Analysis

The researcher applied two data collection techniques—pre-test/post-test, and a survey questionnaire. The pre-test was administered to participants in one class period before their lessons on the Mole, chemical reactions, and stoichiometry. During the treatment period, chemistry classes continued as scheduled, and the *Thinking the Particulate Way* companion booklet was used in all of the chemistry lessons as a source of content knowledge and illustrations, for explanation and reinforcement of concepts, as well as for assessments. After the approximately five-week duration, the participants took the post-test and completed the questionnaire.

Data collected from the Conceptual Stoichiometry Test (CST) were analyzed using a paired-sample (correlated) t-test. Data collected from the Attitude towards the Use of Particle Diagrams (ATPD) questionnaire were analyzed using descriptive statistics in the forms of means, standard deviations, and percentages.

Results

Results of Paired-samples t-test

Analysis of the participants' pre- and post-test mean scores on the four stoichiometry concepts was carried out using SPSS. Table 1 displays the descriptive statistics for the pre- and post-test conditions. While it appears that the participants performed differently under the pre-test and post-test conditions, further information in the form of inferential statistics is needed to determine whether there is any significant difference between participants' pre-test and post-test means on all four concepts.

Table 1. Paired Samples Statistics of Pre-/Post-test Mean Scores on Four Concepts of Stoichiometry

	Concepts Assessed	Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Representative Particle Pre-test	7.46	13	2.73	0.76
	Representative Particle Post-test	11.00	13	2.38	0.66
Pair 2	Mole Ratio Pre-test	16.31	13	3.68	1.02
	Mole Ratio Post-test	18.62	13	2.36	0.66
Pair 3	Limiting Reagent Pre-test	5.77	13	1.42	0.39
	Limiting Reagent Post-test	7.31	13	2.06	0.57
Pair 4	Theoretical Yield Pre-test	5.77	13	1.42	0.39
	Theoretical Yield Post-test	7.31	13	2.06	0.57

A paired-samples t-test was conducted to determine whether there was a statistically significant difference in the pre-test and post-test mean scores of each of the four concepts of

stoichiometry listed in research question 1. Table 2 (following page) displays the results of the paired sample t-test.

Table 2 shows that for all the concepts (pairs 1–4), the p (probability) value is substantially smaller than the specified value of .05, which means there is a highly significant difference between the pre-test and post-test scores. Combining the information from Table 1 and Table 2, the results of the analysis were as follows.

Table 2. Paired Samples t-test Analysis of Pre/Post-test Mean Scores on Four Concepts of Stoichiometry

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of Difference				
				Lower	Upper			
Pair 1 RepPart Pre - Post	-3.54	2.30	.64	-4.93	-2.15	-5.56	12	.000
Pair 2 MolRatio Pre - Post	-2.31	2.39	.66	-3.75	-.86	-3.48	12	.005
Pair 3 LimAgent Pre - Post	-1.54	1.71	.48	-2.57	-.50	-3.24	12	.007
Pair 1 TheoYield Pre - Post	-1.54	1.71	.48	-2.57	-.50	-3.24	12	.007

For the concept of Representative Particles (Pair 1), there was a statistically significant increase in pre-test scores prior to intervention ($M = 7.46$, $SD = 2.73$) to post-test scores after intervention ($M = 11.00$, $SD = 2.38$), $t(12) = -5.56$, $p < .000$ (two-tailed). The mean increase in post-test scores was 2.31, with a 95% confidence interval ranging from -4.93 to -2.15.

For the concept of Mole Ratio (Pair 2), there was a statistically significant increase in pre-test scores prior to intervention ($M = 16.31$, $SD = 3.68$) to post-test scores after intervention ($M = 18.62$, $SD = 2.36$), $t(12) = -3.48$, $p < .005$ (two-tailed). The mean increase in post-test scores was 3.54, with a 95% confidence interval ranging from -3.75 to -0.86.

For each of the concepts of Limiting Reagent and Theoretical Yield, there was a statistically significant increase in pre-test scores prior to intervention ($M = 5.77$, $SD = 1.42$) to post-test scores after intervention ($M = 7.31$, $SD = 2.06$), $t(12) = -3.237$, $p < .007$ (two-tailed). The mean increase in post-test scores was 1.54 with a 95% confidence interval ranging from -2.57 to -0.50. Although the results presented above tell us that the difference obtained in each concept pair was significant, it does not tell us about the magnitude of the intervention's effect.

Table 3 shows that the treatment had the following size effects on these respective concepts: 1.54 on Representative Particles, .96 on Mole Ratio, .90 on Limiting Reagent, and .90 on Theoretical Yield. The effect size was calculated using Cohen's d , which shows standardized differences between two means. An effect size of $d \leq .20$ is considered "Small", a d between .20 and .79 is considered "Medium", and $d \geq .80$ is considered "Large" (Warner, 2013). Thus, we can conclude that the treatment had a large effect on the differences in CST scores for each concept obtained before and after the intervention.

Table 3. Cohen's d Results for Size Effect

Number	Concept	Size Effect	Interpretation
1	Representative Particles	1.54	Large
2	Mole Ratio	0.96	Large
3	Limiting Reagent	0.90	Large
4	Theoretical Yield	0.90	Large

In short, the use of particle diagrams in the instruction of stoichiometry significantly improved AIMS students' understanding of the concepts of representative particles, mole ratio, limiting reagent, and theoretical yield.

Analysis and Interpretation of ATPD Survey Results

A total of 13 survey forms were distributed, and all were completed and used for computations. Results show that the responses most frequently selected by the participants were Strongly Agree (41.0%), followed by Agree (37.2%) and Not Sure (16.7%). The responses least frequently selected were Disagree (3.8%) and Strongly Disagree (1.3%).

The results of the questionnaire were further analyzed by concept (Table 4). More than 80% of the participants responded with Agree and Strongly Agree, and scored between 4 and 5 on a 5-point Likert scale on the concept of Representative Particles. The results suggest that the majority of the participants agreed that the use of particle diagrams helped develop an understanding of this concept. By contrast, the lowest participant scores were for the concept of Theoretical Yield, but the remainder were high, which suggested that the majority of the participants agreed that the use of particle diagrams helped develop an understanding of these concepts.

Table 4. Descriptive Statistics for Concepts of Representative Particles, Mole Ratio, Limiting Reagent, and Theoretical Yield

	Statement	M	SD	%
	<i>Representative Particles</i>			
1.	Particle diagrams help me visualize the particles that make up compounds, mixtures, and elements	4.62	0.51	100
2.	Particle diagrams help me differentiate among atoms, molecules, ions, and combinations of these	4.46	0.78	84.6
3.	Particle diagrams help me understand what happens to the particles of reactants during chemical reactions	4.38	0.65	92.3
	<i>Mole Ratio</i>			
4.	Particle diagrams help me understand what the coefficients in balanced chemical equations represent	4.23	1.01	76.9
5.	Particle diagrams help me determine how many of each kind of atom takes part in a chemical reaction in the lowest whole number ratio	4.15	0.69	84.6
6.	Particle diagrams help me relate coefficients to mole ratio	3.69	0.86	61.6
7.	Particle diagrams help me determine the amounts of substances needed or produced in a chemical reaction	4.54	0.52	100
	<i>Limiting Agent</i>			
8.	Particle diagrams show that in some chemical reactions, reactants are not necessarily all used up	4.62	0.65	92.3
9.	Particle diagrams help me identify the reactants that is all used up first (limiting reagent)	4.46	0.66	92.3
10.	Particle diagrams help me identify the reactant that is NOT all used up (excess reagent)	4.31	0.75	85.6
	<i>Theoretical Yield</i>			
11.	Particle diagrams help me to understand the difference between theoretical and actual yield	3.15	0.99	46.2
12.	Particle diagrams help me identify which reactant determines the theoretical yield	3.08	1.04	30.8

From 85.6% to 92.3% of the participants responded with Agree and Strongly Agree on the concept of Limiting Reagent, which suggested that the majority of participants agreed that use of particle diagrams helped develop an understanding of this concept. Finally, only 30.8% to 46.2% of the participants responded with Agree and Strongly Agree on the concept of Theoretical Yield. These results indicate that less than half of the participants agreed that use of particle diagrams helped develop an understanding of this concept.

The results of the ATPD questionnaire indicate that generally the participants demonstrated a favorable attitude towards use of particle diagrams in the instruction of stoichiometry. The majority of participating AIMS students agreed that use of particle diagrams helped them develop an understanding of the concepts of representative particles, mole ratio, and limiting reagent.

Reliability analysis was carried out on the ATPD scale. Cronbach's alpha shows the ATPD questionnaire possessed an acceptable internal consistency, $\alpha = .80$. This result indicates that the 12 items in the questionnaire are highly interrelated and reliably measure the underlying construct (Pallant, 2011).

Discussion

Studies have revealed that most high school chemistry students lack the conceptual understanding of stoichiometry necessary to answer questions correctly (Dahsah & Coll, 2007; Saltan & Tzougraki, 2011; Kimberlin & Yeziarski, 2016; Shadreck & Enunuwe, 2018). Studies have also found that an understanding of the submicroscopic composition of chemical elements and/or compounds that make up the reacting and resulting substances in chemical reactions is an essential prerequisite to interpreting and solving all stoichiometric problems, especially conceptual ones (Davidowitz & Chittleborough, 2009; Jaber & Boujaoude, 2012; Sujak & Daniel, 2017). In this study, the submicroscopic composition of matter substances was represented by particle diagrams. Students' responses to the use of particle diagrams matched with what was already described in the literature, and confirmed the positive effects of using particulate models to enhance understanding of chemistry concepts.

Findings from this study can contribute to the local learning community in the following ways. The findings should encourage science educators to explore and adapt research-based pedagogical recommendations, and to verify their effectiveness on the learning of their students in their school settings.

The results of the study will help AIMS science teachers evaluate the impact of using particle diagrams in developing students' conceptual understanding of stoichiometry. They also will help teachers establish the extent to which particulate ideas should be incorporated into instruction to maximize concept attainment while avoiding cognitive overloading. Therefore, this study can help teachers develop new and specific strategies for enhancing conceptual learning in chemistry.

This study also encouraged students to approach stoichiometric problems from a particulate perspective. Training students to think "in a particulate way" will build a conceptual foundation not only for stoichiometry, but also for other high school chemistry topics, and will be beneficial for more advanced studies of the subject. This study can also help students rectify their misconceptions about some concepts of stoichiometry. This study could also help students develop appreciation and preference for more in-depth, conceptual understanding, rather than superficial learning.

The findings of this study add modestly to the body of literature on intervention strategies in the teaching of chemistry, specifically stoichiometry. Visual-based conceptual approaches to teaching chemistry have been the primary trend, and they are likely to keep being used. Simple interventions such as the incorporation of particle diagrams in chemistry instruction can be the basis or beginning for more assertive, sophisticated, or elaborate pedagogies that support or enforce progressive conceptual understanding. Using particle diagrams could be an effective way to help students build conceptual understanding in a more elaborate way than this study has been able to demonstrate.

Limitations

They are a few limitations to the study. The first is that the research focused on a small population sample of only 13 high school students enrolled in chemistry class at one international school. The second limitation is that it involved only one chemistry teacher. Hence, the results of the study will have limited generalizability across students, teachers, and schools.

On account of the sample size, there was a reduced ability to detect the actual statistical differences between students' conceptual understanding before and after use of particle diagrams.

Moreover, the use of only one group in the study's pre-test/post-test design could have compromised its internal validity.

Despite these limitations, the data collected can be useful for designing more extensive confirmatory studies or similar studies at other high schools in Thailand in the future.

Conclusion

From the results of the inferential analysis, the use of particle diagrams was found useful in the instruction of stoichiometry. It leads to a better understanding of the concepts of representative particles, mole ratio, limiting reagent, and theoretical yield. The attitudes of the students towards the use of particle diagrams in stoichiometry instruction indicated that all students in the cohort assessed found the diagrams helpful in enhancing their understanding of the concepts of representative particles, mole ratio, and limiting reagent, but not helpful in improving their understanding of the concept of theoretical yield.

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Factor Analysis of Students' Satisfaction with Academic Courses

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Date Received: 9 November 2018 Revised: 14 February 2020 Accepted: 26 February 2020

Abstract

This research aimed to distinguish the factors affecting student satisfaction at selected Seventh-day Adventist higher educational institutions in Southeast Asia. Knowing these factors could help educational leaders to thoroughly plan their strategies and better understand the determinants of student satisfaction. A questionnaire was distributed to student respondents at two higher educational institutions in the Southern Asia-Pacific region, namely Asia-Pacific International University (AIU) in Thailand and Universitas Advent Indonesia (UNAI) in Indonesia. Exploratory factor analysis was used to distinguish the underlying dimensions that drive student satisfaction and to analyze dimensions of academic courses. A sampling adequacy test yielded a value of 0.590, which was > 0.50 ; hence, the sample size was adequate for the analysis. The communalities of all variables surpassed .40, and consequently, were helpful in the model. The results showed that several factors affected student satisfaction with academic courses at AIU and UNAI. The courses that helped them were those which developed problem-solving skills, ability to work together in teams, communication skills, the ability to plan, and those that were organized in a systematic way.

Keywords: *Satisfaction, factor analysis, higher educational institutions*

Introduction

Higher educational institutions are essential pillars in the development of society because they are actually producers of educated and well-grounded people. Likewise, higher educational institutions need to take the satisfaction of their students seriously. In this sense, young people are striving to achieve their purposes and realize their dreams in life. Their ambitions are usually in line with their talents and the knowledge they are striving to gain in their chosen fields. We can see that it is necessary for institutions to create and support particular factors that lead to student satisfaction. Young people make every effort to achieve their goals, and so satisfaction—and dissatisfaction—can lead to many things. At a certain point in their lives ahead, how will this affect students and their decisions? Will they have resentment, and will they have broken characters if they are not satisfied with the course of their academic lives? On the other hand, we see that society looks at the development of institutions, and may have a different view that is unfavorable for the university. Customer satisfaction is indeed important, and students as customers need to be satisfied for many reasons and not only for students but for customers in any kind of service institution.

Customer satisfaction is studied by many types of service institutions; for instance, Direkvand-Moghadam, Hashemian, Delpisheh, Sohili, and Sayehmiri (2014) studied patient satisfaction in emergency care units, while Yusoff, Mcleay, and Woodruffe-Burton (2015) examined various dimensions driving business students in higher educational institutions. Moreover, customer satisfaction affects their decision-making. The identification of customer decision-making goes back to early economists such as decision-making Bernoulli, von Neumann, and Morgenstern, who started to identify and point out the basis of consumer around 300 years ago (Richarme, 2005).

Previous studies conducted by Shirazi (2017), Parahoo, Harvey, and Tamim (2013), Tahar, Mokhtar, Jaafar, Zamani, Sukiman, and Ismail (2013), and Khosravi, Poushaneh, Roozegar, and

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This paper was presented at the 6th International Scholar's Conference held on October 29–30, 2018 at Adventist University of the Philippines, and selected for publication in HBDS.

Sohrabifard (2013) looked at student satisfaction and the factors affecting it. They concluded that satisfaction is important in one's life. Research conducted by Deshields, Kara, and Kaynak (2005), along with Helgesen and Nettet (2007), suggested that continued investigation of student satisfaction helps them in their academic achievement and moreover, contributes to the preservation and existence of higher educational institutions. Thus, they suggest, a higher educational institution should strive for a desirable image that will help to attract more young people. It should also serve them and provide them with academic satisfaction in pursuit of their educational goals.

Theoretical Foundation

The literature presents many views regarding criteria to measure satisfaction. According to Kuo (2010), students look at their education experiences in terms of their satisfaction. Therefore, this research suggests that students with satisfactory experiences will continue their studies. On the other hand, according to Chua (2004), satisfaction is a key element in business continuity and growth in the midst of competition. Moreover, Athanassopoulos, Gounaris, and Stathakopoulos (2001) see that satisfied students are also loyal students, which leads them to pursue a higher degree at the same university. In his research, Shirazi (2017) found three key indicators of academic satisfaction, namely: experienced staff, mutual respect between professors and students, and nurture of self-esteem in students by instructors and administrators. This assertion was supported by studies conducted by James (2001), as well as by Umbach and Porter's (2002). These studies claimed that higher educational satisfaction is found in students who conduct research and have good communication with their professors.

Methodology

A modified questionnaire based on an instrument developed by Seng and Ling (2013) was distributed to student respondents at two higher educational institutions in the Southern Asia-Pacific Division, namely Asia-Pacific International University (AIU) and Universitas Advent Indonesia (UNAI). There are approximately 3,000 students studying at both higher educational institutions. A sample size of 25 students was used for the study, and the results were tested and cleared using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. Factor analysis was used to analyze various dimensions of student satisfaction with academic courses.

The following relevant outputs of the study were as follows: descriptive statistics were used to look at the characteristics of the variables used in the study (Priyatno, 2014), and a correlation matrix was used to look at the relationship between variables used in the study (Riduwan, 2014). For factor analysis, Verma (2013) stated that the KMO and Bartlett's test may be utilized to see if the data is satisfactory for the study, as well as variance that may be shared among variables. Other relevant output includes a scree plot, component loadings, and a varimax-rotated solution. According to Verma (2013), when applying factor analysis, a test battery may be generated that shows the number of factors to be retained, and the total variance explained by these factors. In this manner, the variables in each factor which remain in the solution can be discovered, along with their relative importance. These factors can then be named according to their nature, and tests can be proposed and utilized to survey student satisfaction with the academic courses at any higher educational institution.

Results and Discussion

The results of the study provided solutions to numerous concerns related to the topic. The study used statistical software to process relevant outputs that were specifically chosen for discussion. By using the factor analysis statistical method, the various methods can determine the test battery for assessing student academic satisfaction.

Descriptive Statistics

The study used the Mean and Standard Deviation (SD) to descriptively describe the study's variables. Table 1 displays characteristics of study variables, reporting the mean and SD scores for all

variables. The results show that respondents agree and strongly agree that they are satisfied with academic courses offered in their universities.

Table 1. Descriptive Statistics ($n = 25$)

No	Variables	Mean	Std. Dev.
C 1	Courses and problem-solving skills	4.00	0.71
C 2	Courses and confidence to tackle unfamiliar problems	4.16	0.55
C 3	Courses and sharpened analytic skills	4.24	0.66
C 4	Courses and ability to work as a team member	4.40	0.65
C 5	Courses and written communication skills	4.28	0.61
C 6	Courses and ability to plan one's own work	4.24	0.52
C 7	The course content was organized in a systematic way	4.20	0.58
C 8	Flexibility in the course to suit needs	3.92	0.70
C 9	Course content is valuable	4.04	0.74

Correlation Matrix

Table 2 shows relationships between study variables. The value of “ r ” required for significance at the .05 level is .396, with $N - 2 = 23$ degrees of freedom. The value of “ r ” required for significance at the .01 level is .505.

Table 2. Correlation Matrix

Component	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9
C 1	1.00	.43*	.18	.27	.77**	.56**	.00	.59**	.64**
C 2	.43*	1.00	.46*	.75**	.48*	.58**	.16	.14	.09
C 3	.18	.46*	1.00	.64**	.24	.55**	.52**	.31	-.02
C 4	.27	.75**	.64*	1.00	.55**	.69**	.45	.26	.05
C 5	.77**	.48*	.24	.55**	1.00	.82**	.07	.34	.44*
C 6	.56**	.58**	.55**	.69**	.82**	1.00	.39	.28	.19
C 7	.00	.16	.52**	.45*	.07	.39	1.00	.56**	.08
C 8	.59**	.14	.31	.26	.34	.28	.56**	1.00	.73**
C 9	.64**	.09	-.02	.05	.44*	.19	.08	.73**	1.00

** Correlation is significant at the .01 level.

* Correlation is significant at the .05 level.

Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy & Bartlett's Test

Table 3 displays KMO test results, which express whether the study's sample size was adequate or not for factor analysis. Based on Table 3, the value was .59, which was greater than .50; therefore, the sample size was adequate for analysis. Further, Bartlett's test of sphericity was used to see if the correlation matrix was indeed an identity matrix (Verma, 2013), as postulated in the null hypothesis. Since the correlation matrix p -value was .000, which is less than .01 and a significant score, it was determined that the correlation matrix was not an identity matrix, and so use of the factor model was suitable.

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.59
Bartlett's Test of Sphericity	Approx. Chi-Sq.	168.44
	<i>df</i>	36
	Sig.	.000

Communalities Test

In this statistical test, higher levels of shared variance among variables indicated that most of the variability was explained by factors singled out in the analysis. The communality threshold for variables is .40; results below .40 are considered to be useless, and are usually removed from a model (Verma, 2013). Results from Table 4 show that the shared communalities of all variables were more than .40; therefore, all variables were useful for the model.

Table 4. Communalities Test

Variables	Initial	Extraction
C 1 Courses and problem-solving skills	1.00	.88
C 2 Courses and confidence to tackle unfamiliar problems	1.00	.71
C 3 Courses and sharpened analytic skills	1.00	.73
C 4 Courses and ability to work as a team member	1.00	.84
C 5 Courses and written communication skills	1.00	.87
C 6 Courses and ability to plan one's own work	1.00	.82
C 7 The course content was organized in a systematic way	1.00	.87
C 8 Flexibility in the course to suit needs	1.00	.95
C 9 Course content is valuable	1.00	.86

Eigenvalues

After rotation, the first, second, and third factors explained about 35.4%, 27.5%, and 20.8% respectively (please see Table 5) of the total variance. Thus, in combination, these factors accounted for 83.7% of the data's total variance. The values of factors in the table below displays that the only factors retained in the study were those with Eigenvalues of 1 or higher (Verma, 2013). Since only the first three factors had Eigenvalues that met this requirement, they were the only ones that were retained in this study.

Table 5. Total Variance Explained

Comp.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Variance %	Cumul. %	Total	Variance %	Cumul. %	Total	Variance %	Cumul. %
1	4.27	47.5	47.5	4.27	47.5	47.5	3.18	35.4	35.4
2	1.87	20.8	68.3	1.87	20.8	68.3	2.47	27.5	62.9
3	1.39	15.4	83.7	1.39	15.4	83.7	1.88	20.8	83.7
4	0.56	6.2	89.8						
5	0.40	4.5	94.3						
6	0.26	2.9	97.1						
7	0.16	1.8	98.9						
8	0.05	.6	99.5						
9	0.05	.5	100.0						

Extraction Method: Principal Component Analysis

Scree Plot

Figure 1 presents a scree plot that was constructed by plotting each factor along the X-axis toward its Eigenvalue, which is displayed along the Y-axis. This plot reveals that only three factors had Eigenvalues higher than the bend in the diagram’s “elbow”. Therefore, only these factors were subjected to further analysis.

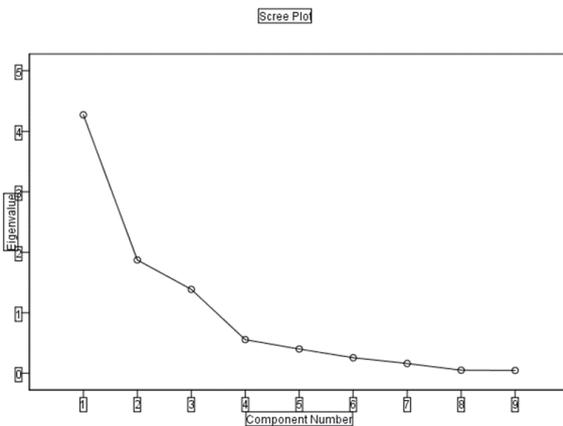


Figure 1. Scree Plot

Extracted Factors

Based on the statistical analysis, three factors were selected, and factor loadings for each variable are displayed in Table 6. This factor solution has not been rotated, and so some variables may contribute to more than one factor. To prevent this, the factors were rotated in the manner prescribed by Verma (2013), which consisted of a varimax rotation that is favored because of its efficiency.

Variables are normally included in a factor if their loading is .70 or more (Verma, 2013). This warrants that a factor obtains an adequate variance from that variable. However, this target may be lowered if an insufficient number of variables are detected for the factor. For this study, variables with factor loadings equal to or more than .60 were retained. For this reason, variables were grouped for each of three factors; a test battery for factors related to student satisfaction with academic courses is shown in Table 6.

Table 6. Component Matrix

Variables	Component		
	1	2	3
Courses and problem-solving skills	.74	.54	-.24
Courses and confidence to tackle unfamiliar problems	.69	-.33	-.34
Courses and sharpened analytic skills	.63	-.51	.28
Courses and ability to work as a team member	.78	-.48	-.07
Courses and written communication skills	.81	.22	-.41
Courses and ability to plan one’s own work	.86	-.19	-.21
The course content was organized in a systematic way	.48	-.31	.74
Flexibility in course to suit needs	.63	.46	.58
Course content is valuable	.48	.77	.19

Extraction Method: Principal Component Analysis, 3 components extracted.

Our rotated component matrix shows that the first component was measured by:

- Courses and problem-solving skills.
- Courses and ability to work as a team member
- Courses and written communication skills
- Courses and ability to plan own work

Thus, the three components were accepted as variable labels after adding the factor scores from the data. Note that these variables all related to respondents receiving soft skills. Therefore, we interpret Component 1 as “satisfaction with soft skills in an academic course”. After interpreting all components in a similar fashion, we arrived at the following descriptions:

- Component 1 - “satisfaction with soft skills in academic courses”
- Component 2 - “satisfaction with content in academic courses”
- Component 3 - “satisfaction with the organization and systematic content of academic courses”

Table 7. Test Battery

Variables	Loadings	Factors
C 1	.74	Courses and problem-solving skills
C 4	.78	Courses and ability to work as a team member
C 5	.81	Courses and written communication skills
C 6	.86	Courses and ability to plan one’s own work
C 7	.74	The course content was organized in a systematic way
C 9	.77	Course content is valuable

Test Battery

The results in Table 7 show important factors in the analysis of student satisfaction with academic courses at Asia-Pacific International University and Universitas Advent Indonesia. The following factors regarding the courses were helpful to students: problem-solving skills, working together as a team, communication skills, developing the ability to plan, course content was organized in a systematic way, and a course was valuable. These factors from the study were divided into three components, consisting of (1) satisfaction with soft skills given in the academic course, (2) satisfaction with content in the academic course, and (3) satisfaction with the organization and systematic content of the academic course.

Conclusions and Recommendations

Students as customers and recipients of academic services hold an important key to higher educational institutions. Therefore, continuous monitoring of their academic satisfaction is deemed important, as this supports their academic achievement. This is one reason that higher educational institutions should be aware of essential facts and real measures of academic satisfaction. In order to generate a battery of tests to incorporate student satisfaction with academic courses, respondents may prefer different variables among the distinctive factors. When each factor’s percentage of the total variability is about the same, then one variable that includes the distinctive factor may be selected to generate a test to estimate student satisfaction with academic courses. Thus, the features shown in the results section above such as problem-solving skills, working with team members, communication skills, planning work, systematic organization, and valuable content can help administrators to maintain and enhance student satisfaction. These factors were divided into three components, namely Component 1: satisfaction with soft skills given in the academic course; Component 2: satisfaction with content of the academic course; and Component 3: satisfaction with organized and systematic content in academic courses. Administrators need to ensure that these

components are fully understood by teachers and academic staff members. School management may also identify more than one variable from some factors, depending on their plausibility.

University administrators should explain the importance of soft skills to teachers; these are comprised of problem-solving skills, ability to work as a team member, written communication skills, and ability to plan one's own work. Program managers must also ensure that course content is regularly updated and kept valuable for students, and that this content is organized in a systematic way.

The researchers recommend using confirmatory factor analysis with further data sets to investigate these questions before this tool is used to estimate student satisfaction with academic courses because this was a simulated study.

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A Comparative Study of Ellen G. White's Interpretation of Selected Synoptic Gospels' Parables with those of Modern Biblical Scholars

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Date Received: 6 November 2019 Revised: 24 February 2020 Accepted: 27 February 2020

Abstract

Seventh-day Adventist biblical scholars and theologians assert that Ellen G. White accepts and applies principles of biblical interpretation when she interprets Scripture. However, there seems to be a lack of academic research to support such a presupposition. One area that seems to be lacking is a comparison between White's interpretations of gospel parables with those of modern biblical scholars. The interpretations of four scholars of selected synoptic gospel parables are compared and contrasted with those provided by White. It is shown that White interpreted selected parables in context using sound principles of biblical interpretation. She agrees with the interpretations of some non-Adventist scholars, and also provides additional insights.

Keywords: *Synoptic gospels, parable interpretation, Ellen White's principles*

Introduction

Pfandl (2005) pointed out that Ellen G. White (EGW) espoused hermeneutical principles that are rooted in those used by Protestant reformers of the sixteenth century (pp. 309–326).

^a Furthermore, he asserted that EGW rejected the methods of Historical-Critical scholars, while at the same time she also rejected extreme literal interpretations of the Word of God. In fact, White explicitly expressed agreement with what were considered as foundational principles of biblical interpretation. One of these was "sola scriptura." She stated, "In our time there is a wide departure from their doctrines and precepts, and there is need of a return to the great Protestant principle—the Bible, and the Bible only, as the rule of faith and duty" (White, 1911, pp. 204–205). This foundational principle implies the primacy and sufficiency of the scripture. She also supported such principles as "tota scriptura," "analogia scriptura," and "spiritual things are spiritually discerned" (White, 1911; White, 2002a).

Aside from EGW's support of these foundational principles of biblical hermeneutics employed by Protestant reformers, which modern evangelical conservative scholars accept, she also seems to agree with the principles of interpreting parables as accepted and applied by modern biblical scholars. This means that a parable is not the truth in itself, but is just a vehicle used by Jesus to illustrate the truth. She remarked that

So wide was Christ's view of truth, so extended His teaching, that every phase of nature was employed in illustrating truth. The scenes upon which the eye daily rests were all connected with some spiritual truth, so that nature is clothed with the parables of the Master (White, 2002b, p. 20).

Modern biblical scholars have presented many studies on the interpretation of parables. However, there seems to be lack of studies comparing EGW's interpretations of gospel parables with those of such scholars. This study compares and contrasts EGW and four modern scholars' interpretations of selected synoptic gospel parables. Four scholars were selected because they represent major Protestant theological "veins" such as: Lutheran theology, Reformed theology, and

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

Evangelicalism. Furthermore, these are well-known scholars in the field of gospel parable interpretation—i.e., Craig Blomberg (2012), Arland J. Hultgren (2000), Simon J. Kistemaker (1987), and Klyne R. Snodgrass (2008).

The selected parables were:

- (1) The ten virgins,
- (2) The prodigal son, and
- (3) The rich man and Lazarus.

This study will not deal with the issue of whether or not a parable has one or more points. Debate on this issue has occurred since the time of Adolf Julicher, who asserted that a parable has only one main point. However, other scholars have argued otherwise.

Biblical Scholars and EGW on the Interpretation of Ten Virgins (Matt 25:1–13)

Blomberg (2012) asserted that the entire parable of the ten virgins “was an allegory from its inception” (p. 241). But he also insisted that the “allegorical elements are limited to three main characters: the bridegroom as a natural symbol of God . . . and the wise and foolish virgins as those who, spiritually, are either prepared or unprepared for Judgment Day” (p. 241). Blomberg suggested that the main points of the parable were as follows:

- (1) Like the bridegroom, God may delay his coming longer than people expect;
- (2) Like the wise bridesmaids, His followers must be prepared for such a delay—discipleship may be more arduous than the novice suspects; and
- (3) Like the foolish bridesmaids, those who do not prepare adequately may discover a point beyond which there is no return—when the end comes, it will be too late to undo the damage.

Furthermore, he also emphasized that the injunction “keep watch, because you do not know the day or the hour” (Matt 25:13) was simply a concluding command that epitomized the necessary response true disciples must make in light of all three points of the passage (Blomberg, 2012).

Snodgrass (2008) insisted that the parable is not an allegory. He pointed out that allegorical interpretations of the parable “are not demonstrable from the text, and do not further the analogy, which is concerned to promote preparedness” (p. 515). He also suggested that “in the analogy there is correspondence between the coming kingdom (and by implication the King) and the coming of the bridegroom and between those prepared or not prepared and the two groups of young women” (p. 515). Snodgrass pointed out that many other associations are not valid such as:

- (1) The virgins are not the bride or the church;
- (2) The two classes of virgins do not represent the Gentiles and Jews;
- (3) The number ten has no particular significance;
- (4) Sleep does not suggest lack of vigilance;
- (5) Sleep and rising from sleep do not mean death and resurrection; and
- (6) Oil does not refer to good works or the Holy Spirit.

Snodgrass concluded that this parable taught about the “wisdom needed in view of the eschaton” (Snodgrass, 2008, p. 517).

Hultgren (2000) also suggested that the parable

Signifies that the disciples of Jesus are to be wise, as the five maidens were, in some respect. That is that Jesus as the bridegroom may be delayed, even though his coming is certain. . . . the disciples of Jesus should be ready for the long haul (pp. 175–176).

He also asserted that the parable “contains a number of allegorical features” (p. 176). He showed that the allegorical features which are apparent, at the Matthean level, are as follows (pp. 176–77):

- (1) The marriage feast represents the gathering of the Messiah and His people;
- (2) The bridegroom represents Christ;
- (3) His delay and eventual coming represent the delay and yet the certainty of the parousia;
- (4) In the light of all that, the closing of the door represents the final judgment; and
- (5) The wise and the foolish women symbolize those who are prepared at the final judgment (true Christians), and those who are not.

He concluded that Jesus “sets forth the need for his disciples to be prepared, and therefore wise, at the coming of the kingdom in its fullness, a time that is associated with judgment, exclusion of some, and feasting by those who are admitted” (Hultgren, 2000, p. 177).

Kistemaker (1987) posited that the parable of the ten virgins is “intended to teach the pointed lesson of being prepared” (p. 129). He also suggested that Jesus is the bridegroom (see Matt 9:15) in the parable. He also noted that watchfulness “is not the outstanding characteristic that is taught. Rather, it is the quality of preparedness that is predominant” (p. 133). Kistemaker also pointed out that this parable was interpreted allegorically from the time of the early church up to the present. He insisted that such “interpretation leads to confusion and frequently ends in nonsense” (p. 134). For Kistemaker, the parable has a central message to convey, that is, the parable “clearly teaches his followers to be prepared for his (Jesus) return” (p. 135). The parable is directed at the followers of Jesus. The wise are constantly seeking to do the will of God, and the foolish ones seem to pay no attention to the imminent return of their Lord (p. 135).

White (2002b) seems also to suggest that the parable is an allegorical parable. She gave meanings to the features of the parable, as noted below in Table 1.

Table 1. The Meanings of the Features of the Parable

Features of the Parable	Meaning
1. Two classes of watchers	1. Two classes of professed followers waiting for their Lord
2. Virgins	2. They profess a pure faith
3. Lamps	3. The word of God (cf. Ps 119:105)
4. Oil	4. The Holy Spirit (cf. Zech 4:1–14)
5. 10 virgins	5. The church
6. Bridegroom	6. Jesus
7. The coming of the Bridegroom	7. The second coming of Jesus
8. The wise did not give oil to the foolish	8. In spiritual things, no man can make up for another’s deficiency
9. Midnight	9. The coming of Christ will be at the darkest part of earth’s history

In the parable of ten virgins, White (2002b) seemed to emphasize the idea that the wise, having oil in their vessels with their lamps, were to shed light into the darkness of the world. The Holy Spirit develops in men the attributes of God through the implanted word of God. As a result, they can shine forth the light of His glory—His character. She continued “the children of God are to manifest His glory. In their own life and character they are to reveal what the grace of God done for them” (p. 415). She also emphasized that the “class represented by the foolish virgins are not hypocrites. They have a regard for truth, they have the truth; but they have not yielded themselves to the Holy Spirit’s working” (p. 411). She also highlighted the fact that “both parties were taken unawares; but one was prepared for the emergency, and the other was found without preparation” (White, 2002b, p. 411).

Biblical Scholars and EGW in the Interpretation of the Prodigal Son (Luke 15:11–32)

At the outset of his essay on the interpretation of the prodigal son, Blomberg (2012) pointed out that the parable “poses special problems for the theory that parables can make only one main point” (p. 199). Furthermore, he insisted that the parable contained three episodes rather than two.

Consequently, the parable teaches three main points, one per character, and one per episode. These main points are as follows:

- (1) Even as the prodigal always had the option of repenting and returning home, so also all sinners, however wicked, may confess their sins and turn to God in contrition;
- (2) Even as the father went to elaborate lengths to offer reconciliation to the prodigal, so also God offers all people, however undeserving, lavish forgiveness of sins if they are willing to accept it; and
- (3) Even as the older brother should not have begrudged his brother's reinstatement but rather rejoiced in it, so those who claim to be God's people should be glad and not mad that He extends His grace to the most undeserving.

Blomberg (2012) also stressed that "the three main points of the parable also illustrate the impossibility of avoiding an allegorical interpretation. Each character stands for someone other than himself" (p. 201). Evidently, as Blomberg pointed out, every commentator has noticed the close correlation between the prodigal and the "tax collector and sinners," and the older brother as the "Pharisees and teachers of the law" (p. 201). The father in the parable represents God. The story, Blomberg concluded, was used by Jesus "to illustrate God's amazing patience and love for His ungrateful children" (p. 204).

Snodgrass (2008) also concurred with Blomberg's "three-point parable" by calling this parable a "triangle parable" "in which an authority figure relates to two subordinate and contrasted persons or group" (p. 124). However, he disagreed with Blomberg's "three-episode idea" by saying "that this was always a two-part parable as most scholars acknowledged" (p. 128). Like Blomberg, Snodgrass said that "nearly all admit or assume the straightforward associations of the parable with God, sinners, and the righteous. It is hard to avoid such connections" (p. 136). Furthermore, Snodgrass accepted that "parables to one degree or another are allegorical." But he does not see all the details of the parable with allegorical representations. He is quick to mention that

The specifics of the prodigal's plight do not stand for theological realities; they paint a picture of degradation and need, especially for Jewish hearers. The father's extravagant action in receiving the prodigal paints a picture of eager reception, but individual actions do not stand for theological ideas. Similarly, the description of the restoration of the prodigal with robe, ring, shoes, and fattened calf for celebration paints a picture of joy and full acceptance, but these items do not have individual referents (Snodgrass, 2008, p. 136).

He further warned about reading too much theology into the parable such as the Messianic banquet, atonement, mediator, and repentance. For him, the parable simply presented the powerful saving grace of God. Furthermore, Snodgrass stressed that the parable had several purposes, namely:

- (1) To emphasize compassion—the unquestioning love of the father mirrors the attitude of God. It is a demonstration of grace with which God reaches out to embrace sinful people;
- (2) To highlight God's invitation to celebrate and rejoice;
- (3) To defend Jesus' action of associating with sinners; and
- (4) It functions as an invitation for hearers to take the same attitude toward sinners.

Hultgren (2002) agreed with Blomberg's three-episode notion asserting that the parable had three main parts:

- (1) The departure of the younger son (15:11–19);
- (2) Home-coming of the son and his welcome by the father (15:20–24); and
- (3) The episode between the father and the older son (15:25–32) (p. 73).

He pointed out that the father in the parable represents God, the prodigal represents those who were despised with whom Jesus associated, and the elder brother represents the Pharisees (Hultgren, 2002, p. 84). He also suggested that the parable had three points:

- (1) Jesus sought to illustrate the loving character of God;
- (2) Jesus sought to vindicate His message and activities (fellowship with the outcasts) in reply to His critics; and
- (3) He sought to teach His opponents that the time had come for celebrating the ingathering of those repentant and who were responding to His message.

Kistemaker (1987) also asserted that the parable should be better described as “to speak of the two sons and their father” (p. 216). He insisted that “by means of these characters, Jesus reflected the composition of his audience. . . . The prodigal son portrayed the moral and social outcast, his brother the self-righteous Jew, and the father was a reflection of God” (p. 216). He further pointed out that the “parable vividly depicts God’s love toward His children, the wayward and the obedient” (p. 216). Kistemaker concluded that “It was Jesus’ intention to describe the attitude of the Pharisees and the teachers of the Law toward tax collectors and prostitutes” (p. 225). He added “the father’s attitude in the parable is representative of God’s forgiving love toward a sinner who repents. As the father said to his servants, ‘let’s celebrate,’ so God with his angels rejoices over one sinner who repents” (p. 225).

It is interesting to note that White (2002b) also, as the scholars cited above, saw that the father in the parable represented God, the prodigal son represented the publicans and sinners, and the elder son represented the Pharisees and unrepentant Jews of Jesus’ day. Furthermore, White (2002b) stressed the love, mercy and compassion of God as represented by the father’s action of running and embracing his son when he was still “a great way off” (pp. 202–205). She also emphasized the rejoicing of heaven for the return of a wayward sinner (p. 207). At the same time, she took note that the elder brother’s attitude toward his brother, which represented the unrepentant Jews’ attitude of “contempt upon those whom they regard as publicans and sinners (p. 209). White concluded that “in the parable the father’s remonstrance with the elder son was Heaven’s tender appeal to the Pharisees. ‘All that I have is thine’—not as wages, but as a gift. Like the prodigal son, you can receive it only as the unmerited bestowal of the Father’s love” (p. 209).

Biblical Scholars and EGW Interpret the Parable of the Rich Man and Lazarus (Luke 16:19–31)

As for the parable of the rich man and Lazarus, Blomberg (2012) asserted that it can be labeled as “example story” rather than a proper parable. He also suggested that the characters in the story “do not seem to symbolize ‘spiritual counterparts’ but simply represent other people in identical situations—certain rich men, certain poor men and those who dwell in the presence of God” (p. 257). Blomberg also ruled out the suggestion of some scholars^b that this story represented a real event that happened to real people in an intermediate state. On the other hand, he concurred that the “parable should most likely be seen as reflecting the final state of both individuals” (p. 260). Furthermore, he pointed out that the parable contains three main lessons (p. 261):

- (1) Like Lazarus, those whom God helps will be born after their death into God’s presence;
- (2) Like the rich man, the unrepentant, disclosed especially by their miserliness, will experience irreversible punishment; and
- (3) Through Abraham, Moses, and the prophets (and now through Jesus), God reveals himself and His will so that none who neglect it can legitimately protest their subsequent fate. He also argued that “it is impossible for a Christian to read this verse (Luke 16:31) without thinking of the resurrection of Christ”

For Snodgrass (2008), the parable is inappropriately labeled as an “example story,” because, as he pointed out, “we are not told enough about the actions of either the rich man or Lazarus for

either actually to be an example” (p. 419). He insisted that this was not a true story, as some preachers in the past asserted, but a parable. He also suggested (p. 426) that

The identification of the persons addressed with this parable is not crucial as elsewhere . . . we should probably think of a double audience of both disciples and Pharisees, but the absence of any indication of the audience may be intentional to make the parable universal in application.

Furthermore, he emphasized that the parable had two themes or foci: first, judgment for the wrong use of wealth. He stressed that the parable is

Specifically a warning to the wealthy for their neglect of the poor. As the reference to Moses and the prophecies indicates, the message of the parable was not limited to the time of the in-breaking of the kingdom. . . . Repentance in view of the kingdom means the right use of wealth and the repudiation of exploitation and injustice (Snodgrass, 2008, p. 433).

Second, the sufficiency of Scripture. He also highlighted the view of some scholars that the parable does not intend to give a description of life after death. However, he asserted that “the parable’s eschatological relevance cannot be wiped away” (p. 432). He added,

The parable is a warning to the rich and emphasizes the importance of what humans do with the present, and it still teaches that humans will be judged for the way they lived and that the consequences will be serious (Snodgrass, 2008, p. 432).

Hultgren (2000), like the other scholars cited above, also insisted that it was not the purpose of the parable to reveal the condition of life after death. He asserted that the situation in the parable “appears to be permanent abode and a place of torment referring to eschatological punishment comparable to ‘hell’” (p. 113). It seems that Hultgren (2000), like other scholars, also agrees with the idea that the “main point of the parable is to be found in the second part (16:27–31). That is to say, the parable is primarily a warning to persons who, like the five brothers of the Rich Man, still have time to repent and do the will of God” (p. 115). He added, “The will of God has been clearly revealed in the law and the prophets” (p. 115). He concluded that the

Teaching of the parable would then be not simply that there is a reversal of conditions at death for the rich and the poor, but rather that the teachings of God concerning care for the poor are clear in the law and the prophets (Hultgren, 2000, p. 115).

Kistemaker (1987) suggested that, based on the immediate context, “the content of the parable relates to the comments addressed to the Pharisees on such vices as love of money and self-righteousness” (p. 243). He stressed that “the Pharisees were able to recognize themselves in the Rich Man” (p. 243). Furthermore, he asserted that the Pharisees “were the ones depicted by the Rich Man in hell, and the outcasts were represented by Lazarus” (p. 244). Thus, he concluded that “the parable was addressed to them” due to this reason:

The Pharisees on more than one occasion had asked him to give them a sign from heaven. . . . Now these Pharisees heard the Rich Man in the parable ask Abraham for a sign from heaven. . . . In the Rich Man’s request the Pharisees heard the echo of their own words (Kistemaker, 1987, p. 244).

Kistemaker pointed out (p. 245) that the parable teaches lessons that

(1) man should listen to God’s word wisely and obediently; (2) It calls him to repentance and faith; (3) it tells him that he is living in a period of grace; (4) it instructs him to put aside self-righteousness; (5) it reminds him that man’s destiny is irrevocably sealed at the time of death.

According to White (2002b), Lazarus represented the suffering poor who believed in Christ. It seems that the Rich Man in the parable represented the many rich men in the Jewish nation who used the Lord’s goods for self-gratification. Christ also presented this picture before priests and rulers, scribes and Pharisees. Furthermore, White (2002b) pointed out that the story was a prevalent

preconceived opinion about the condition of man after death during the time of Jesus. He met people on their own ground. He used this as a parable to emphasize the truth that

No man is valued for his possessions; for all he has belongs to him only as lent by the Lord. A misuse of these gifts will place him below the poorest and most afflicted man who loves God and trusts in Him (White, 2002b, p. 263).

White (2002b) also stressed that “Christ desires his hearers to understand that it is impossible for men to secure salvation of the soul after death” (p. 263). She added, “Christ represented the hopelessness of looking for a second probation. This life is the only time given to man in which to prepare for eternity” (p. 263). She concluded that “the lesson to be gathered from it is that every man is given sufficient light for the discharge of the duties required of him. Man’s responsibilities are proportionate to his opportunities and privileges” (p. 265). She further suggested “those who refuse to be enlightened by Moses and the prophets and ask for some wonderful miracle to be performed would not be convinced if their wish were granted” (p. 265).

Comparison and Contrast between Biblical Scholars and EGW

When comparing biblical scholars and EGW on the parable of the ten virgins, it is now evident that these commentators are divided as to how the parable of ten virgins is to be interpreted. For Blomberg and Hultgren, the parable has allegorical features. But Blomberg (2012) insisted that the allegorical features were limited to three main points. This contrasts with Hultgren (2000), who went beyond the three-point emphasis. On the other hand, Snodgrass and Kistemaker agreed that the parable was not an allegory. When it comes to EGW, the way she interpreted the parable of ten virgins seems to suggest that this is an allegorical parable, although she did not explicitly state it. It is noted that all of the scholars emphasized that the main point of the parable is “preparedness.” However, as for EGW, it seems that this is only one of her points, since she also emphasized the idea that the believers, in view of the *parousia*, should shine forth into the darkened world revealing God’s glory.

In the parable of the prodigal son, it is evident that these scholars and EGW agree that the three characters in the parable represented three personages in real life. The father represents God, the prodigal son represents the publicans and sinners with whom Jesus was associated, and the elder son represented self-righteous Jews or the Pharisees. Both Blomberg and Snodgrass asserted that the parable was an allegorical parable. Furthermore, both Blomberg and Hultgren insisted that the parable had three main points, whereas Snodgrass saw a four-fold purpose. Both Snodgrass and Hultgren agreed that one of the points of the parable was to vindicate Jesus’ association with publicans and sinners. These scholars and EGW did not give meanings to every detail of the parable. It should also be highlighted that these commentators and EGW unanimously indicate that Jesus emphasized the love, compassion and grace of God towards repentant sinners. They also stressed that the father’s invitation to rejoice and celebrate in the parable is God’s invitation for the self-righteous Pharisees to rejoice with Him in the repentance of publicans and sinners. Uniquely, EGW stressed a point that was not emphasized by the scholars. She indicated that Jesus emphasized that the elder son’s inheritance could not be received as wages, but only as a gift—it is the unmerited bestowal of the father’s love.

Analyzing the comparison between the scholars and EGW on the parable of the Rich Man and Lazarus, they unanimously agreed that the parable does not teach about man’s condition after death, although they believed, except for EGW, in the consciousness of souls after death. Both Blomberg and Snodgrass agreed that this parable was not a true story. Both of them also asserted that this was an “example story,” which means that the characters did not symbolize spiritual counterparts in the audience of Jesus. Blomberg and Hultgren agreed with each other that the situation of both men in the parable may have reflected the final state of the individuals—suffering in hell, and enjoying a blissful heaven for eternity. Contrary to Blomberg, Snodgrass and Hultgren did not see spiritual counterparts of the rich man and Lazarus in Jesus’ audience. Kistemaker and EGW asserted that Lazarus in the parable represented the suffering poor (EGW) or the social outcasts (Kistemaker) in Jesus’ day. Furthermore, the Rich Man represented the Pharisees (Kistemaker), or those Jews (including the priests, rulers, scribes, and Pharisees) who used the Lord’s goods for self-gratification

(EGW). It might also be highlighted that the scholars and EGW agreed that the parable stressed the importance of scripture over signs and miracles in convicting men to repentance and obedience to God's will. It is also evident that the commentators and EGW agreed that the present is the time for repentance and obedience to God's word concerning the proper use of wealth—care for the poor—because at death, man's destiny is fixed.

Conclusion and Recommendation

In conclusion, it is clearly evident that EGW did not interpret the three parables irresponsibly or out of context. She followed sound principles of biblical interpretation. When she viewed a parable as allegorical, some biblical scholars have also done the same. Her view of the character of the parables in relation to their spiritual correspondence was not off-tangent with that of other scholars. The spiritual truths that she drew from these parables were usually similar to those of the commentators highlighted. However, in a few instances, she had additional truths which they did not see.

A further fruitful study might deal with the interpretation of the synoptic parables by scholars who were contemporaries of White.

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Endnotes

^a For more details of Historical-Critical methods, see Hasel, G. (1985); *Biblical interpretation today*, (pp. 7–99). Washington, DC: Biblical Research Institute. For Historical Grammatical Methods (HGM), see pp. 100–113. For a detailed discussion of HGM, see also Hasel, G. (1980); *Understanding the living word of God* (pp. 13–228). Mountain View, CA: Pacific Press. For a conservative Protestant hermeneutics, see Berkof, L. (1950), *Principles of biblical interpretation* (pp. 11–166). Grand Rapids, MI: Baker Book House; Ramm, B. (1999), *Protestant biblical interpretation* (pp. 1–287). Grand Rapids, MI: Baker Publishing Group; Sider, J. (1995), *Interpreting the parables* (pp. 13–246). Grand Rapids, MI: Zondervan.

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Consumption Patterns of Dormitory Students at a Private University

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Date Received: 14 November 2019 Revised: 2 February 2020 Accepted: 17 February 2020

Abstract

In this study the consumption patterns of dormitory students in a private university in Indonesia was investigated. The study covered both food and non-food consumption patterns based on gender, years of study, and type of dormitory. The research instrument was an adapted and modified questionnaire administered through a convenience sampling technique to students ($N = 441$) from seven dormitories. A t -test and one-way ANOVA along with Tukey's Test were used to analyze the data. It was found that female students generally displayed a higher consumption pattern than males, with non-food items being higher than food consumption for both groups. Expenditure on sports was an exception, with males spending more than females. It was concluded that female students had a greater number of needs to satisfy. Generally, those students who lived in cheaper dormitories tended to spend less than those in the more expensive ones. Senior students tended to spend more on food and less on non-food items than other cohorts. Student needs were unique and varied, especially for non-food consumption items.

Keywords: *Consumption patterns, dormitory students, private university*

Introduction

Consumption is a common yet crucial activity in peoples' lives. Consumption has a broader meaning than in reference to food and drink. It involves not only food, but also other things individuals buy or consume to fulfill their needs and wants. What people consume can measure needs, but it also could measure poverty better, because deprived people report their consumption patterns more accurately (Galer, 2012). In addition, someone's welfare can be measured from the level of consumption. Rifqi (2015) found that people who consumed sufficient calories had a greater possibility of thriving compared to those with poor intakes. The fulfillment of basic needs permits an individual to fulfill other needs. This is in line with Maslow's Hierarchy of Needs Theory (Robbins & Judge, 2013).

College students, like other people, show various consumption activities, not only for food and drink, but also for other commercial items (Mulyani, 2015). In studies of young men students, it has been found that they are more aware of branded products (Jeevitha & Priya, 2019) and are exposed to lifestyles that could tempt them to spend excessive money on such things (Tyagi & Ranga, 2017). Student consumption patterns vary covering both their needs and wants. However, because most of them focus on their study and have no obligation to work to earn money, their main source of money comes from their parents (Wurangian, Engka, & Sumual, 2015), which could make some of them less responsible in managing the money given. This could lead to shortness of cash and possibly to financial problems (Bona, 2017). Therefore, it is a good thing when they spend their money wisely to meet their needs and wants.

Studies have been conducted to monitor college students' consumption patterns, and to determine whether there are general consumption patterns among students (Maxey, Fenske, & Boyd, 1979; Tama, 2014; Wurangian, Engka, & Sumual, 2015; Bona, 2017; Jeevitha & Priya, 2019). Some of the studies focused solely on non-food consumption patterns (Mulyani, 2015; Julian, 2016). Studies mainly have focused on students who lived off campus, except for a study completed by Maxey,

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This paper was presented at the 7th International Scholar's Conference held on October 28–29, 2019 at Universitas Advent Indonesia, and selected for publication in HBDS.

Fenske, and Boyd (1979). Meanwhile, studies specifically for dormitory students and their consumption patterns are rare and focused on dietary habits and nutrition (Kim & Kim, 2005), not on their general consumption or spending patterns.

It is expected that this study might contribute valuable information to students, parents, and university administrators. For students, they can gain insights into their consumption patterns so that they will know how their money is spent. On the other hand, parents may learn about their children's consumption so that they can give good advice on managing money and providing guidance on priorities when buying. As for administrators, they will gain valuable information of what students need and how they can provide for these needs on campus. In addition, this study can give additional knowledge about consumer behavior and preferences regarding dormitory students' consumption patterns.

Literature Review

The patterns of students' consumption have been investigated in a number of configurations. Maxey, Fenske, and Boyd (1979) investigated spending patterns of scholarship holders in three categories: those living with family, those owning their own home or apartment, and those living on campus. They found that students living with families spent most on tuition, followed by transportation, clothing, books and stationery, entertainment, and personal expenses. Meanwhile, the group of students who had their own houses or apartments spent their money on rooms or rent, tuition fees, transportation, books, clothing, and so on. The third group, students who live on campus, had the most expensive consumption pattern, namely dormitory and tuition fees, books and stationery, clothing, entertainment, and so on. In addition, it was also found that students living on campus (dormitories) had higher personal expenses than the other two groups. This is because they lived alone and received an allowance from parents, so they managed their own expenses. A recent study by Bona (2017) found that most college students in Cantilan, the Philippines, spent a larger proportion of their money for school assignments and supplies, while they spent less for fashion and transportation. This was considered due to the higher cost of supply materials and cheaper public transportation in the study area. Meanwhile, a recent study by Jeevitha and Priya (2019) found that beauty care accounted for the highest spending of college students in Coimbatore, India. These studies showed different patterns, ostensibly because of country differences. Yet, both suggested that college students should plan wisely on their spending and plan to save some of their money for future use.

In Yogyakarta, studies were carried out by Tama (2014) and Mulyani (2015), who examined the consumption of students at one of the state universities. The difference between these two studies was that while the first one examined student consumption in general, the subsequent study focused on students' non-food consumption patterns. Tama's (2014) study found that while there were no differences in food and non-food consumption between male and female students, males actually consumed more food than females. In addition, there were differences in consumption patterns for students who lived in boarding houses and those who lived with their parents. Those who lived in boarding houses rarely ate breakfast and used their allowances for communication and transportation. In contrast, the study by Mulyani (2015) found—interestingly enough—that their biggest consumption items were fashion products, followed by entertainment, transportation, communication, and tuition support costs. It is understandable that the development of fashion trends and lifestyles makes students strive to stay updated with the latest looks. This trend was supported by Cosmas (1982) who found that there was a relationship between lifestyle and the decision to buy a desired product. It was also found that while there were no differences in consumption patterns by gender, the allocation for fashion was greater for women, while for men it was for transportation. Further, this study found that non-food consumption was higher than food-consumption in all years of the study, with fashion and transportation topping the list.

Consumption patterns of students were also examined in Lampung, Indonesia, by Julian in 2016. The results showed that monthly allowances had a positive effect on the consumption of students living in boarding houses. The greater the allowance, the higher the consumption. Another

finding was that male students consumed fewer goods and services than female students. In addition, those who had savings demonstrated less consumption than those who did not. Finally, students living in boarding houses spent on various things besides for college supplies, as they needed to take care of themselves.

Methods

This study used a quantitative approach, where the research instrument was a questionnaire adopted from Mulyani (2015) and several previous studies. Slight modifications were introduced to include questions about food expenses. Dormitory heads, monitors, and students assisted with questionnaire distribution. After distribution, these groups received instructions on answering strategies for the questionnaire, so as to be able to offer help to all respondents. The population of the study was Universitas Klabat (UNKLAB) students during second semester of the 2017–2018 academic year who resided in three male dormitories, namely Genzet, Crystal, and Guest House dormitories. It also included residents of four female dormitories, namely Bougenville, Edelweiss, Annex, and Jasmine. These dormitories are ranked from the least to most expensive dormitories at UNKLAB. Using a convenience sampling technique, 459 dormitory students were involved and participated in the research, yet 18 students did not answer the questions properly. Thus, valid samples were received from 441 students consisting of 104 students from Crystal, 25 students from Guest House, 30 students from Genzet, 77 students from Jasmine, 147 students from Edelweiss, 43 students from Annex, and 15 students from Bougenville. To analyze the data, a descriptive analysis technique was used. To determine whether different consumption patterns existed based on gender, a *t*-test analysis was used, while regarding their years of study and type of dormitory, a one-way ANOVA with Tukey's Test was used.

The investigation was implemented to study both food and non-food consumption patterns of students who resided in UNKLAB dormitories. Based on this purpose, the following hypotheses were generated:

H₀: There is no difference in the consumption patterns of dormitory students based on gender, years of study, and type of dormitory.

H₁: There are differences in consumption patterns of dormitory students based on gender, years of study, and type of dormitory

Results and Discussion

The consumption patterns were divided into two categories: food (food, drinks, snacks), and non-food consumption (transportation, phone credit, Internet, entertainment, college supplies, cosmetics and toiletries, accessories, clothing, hobby, and sports). It is shown that in general, dormitory students spend more money for non-food consumption (mean = 360,000 Rupiahs, or US\$ 26.32)², compared to 221,000 Rupiahs (Rp., or about US\$ 16.16) for food consumption.

The three variables that had the highest mean values were food (Rp. 124,650, or \$9.12), college supplies (67,390, or \$4.93), and Internet packages (63,710, or \$4.66). The average dormitory students spent their allowance monthly as follows: Private transportation Rp. 9,430, sports equipment Rp. 9,510 and hobbies Rp. 14,390. Overall, the average non-food consumption expenditure of dormitory students was greater than that for food consumption. This is understandable because of the diverse non-food needs of students, and the many things they needed to purchase. The smallest consumption or expenditure was for private transportation, presumably because dormitory students were not permitted to bring their private vehicles. The existence of such expenses is possibly on account of some students' families living near campus, and those who have vehicles which were brought occasionally near to the campus.

² At current exchange rates, US\$ 1 is equivalent to about 13,800 Rupiahs.

Table 1 presents the descriptive statistics results of students' consumption patterns based on gender. The average non-food consumption patterns for both males and females were higher than their food consumption patterns, even though females had higher consumption patterns for both categories compared to males. This may be on account of the fact that they can eat in the university cafeteria, so they spend more money on non-food consumption. However, some of them do spend a lot on food (maximums of Rp. 1,450,000, or \$106.02, and Rp. 1,210,000, or \$81.97, for male and female, respectively), especially for those who came from wealthy families.

Table 1. Overall Consumption Patterns of Male and Female Students

Gender	<i>N</i>	Mean	Median	<i>SD</i>	Var.	Min.	Max.
Male							
Food consumption	159	169.27	100.00	210.07	44,127.93	0.00	1,450.00
Non-food consumption	159	274.69	177.00	322.40	103,940.05	0.00	2,000.00
Female							
Food consumption	282	250.73	200.00	213.12	45,420.91	0.00	1,210.00
Non-food consumption	282	408.11	300.00	368.14	135,530.07	0.00	1,865.00

Note: In thousand Rupiahs

Students' consumption patterns based on year of study are shown in Table 2. Average food consumption of freshmen was the lowest compared with sophomores, juniors, and seniors, while non-food consumption of juniors was the highest, with the lowest being shown by senior students. There are two possibilities to account for this pattern. First, it could be that freshmen students spend less to buy food and instead eat at the cafeteria, while senior students spend more to buy food. Second, freshmen students tend to buy cheaper food than others. Senior students, on the other hand, spend more on average on food. Otherwise, non-food consumption of senior students was the lowest, probably because they reduced their unnecessary consumption and become wiser in managing their money, or because they needed to save money for paying graduation fees by reducing their spending. This finding contradicts the data of Villanueva (2017), who found that senior students on average spend more than others, except for freshmen students. This is possibly a reflection of different cultures and mindset, where senior students in New York spent more as they looked forward to receiving higher incomes when they graduated.

Table 2. Overall Student Consumption Patterns Based on Year of Study

Years of Study	<i>N</i>	Mean	Median	<i>SD</i>	Var.	Min	Max
Freshmen							
Food consumption	195	199.18	145	203.19	41,284.42	0	1,450
Non-food consumption	195	344.58	250	325.04	105,649.66	0	1,650
Sophomore							
Food consumption	109	228.48	150	202.69	41,083.01	0	900
Non-food consumption	109	372.19	270	336.57	113,276.27	0	1,260
Junior							
Food consumption	80	228.69	158	208.64	43,528.83	0	1,000
Non-food consumption	80	404.09	250	430.56	185,383.19	0	1,865
Senior							
Food consumption	57	273.37	200	275.98	76,167.63	0	1,000
Non-food consumption	57	327.60	200	393.33	154,706.07	0	2,000

Note: In thousand Rupiahs

Meanwhile, students' consumption patterns based on their dormitories showed that the average food and non-food consumption patterns reflected the type of dormitory occupied. Those who lived in a cheaper dormitory tended to spend less than those in expensive dormitories. The reason was that students who lived in expensive dormitories came from medium- to upper-income families,

and usually received greater allowances from their parents, resulted in a higher consumption, a conclusion supported by Julian (2016).

In the meantime, the average food and non-food consumption for females showed a different pattern. While the average food and non-food consumption pattern increased from Bougenville, and Edelweiss to Annex dormitories in line with increasing accommodation costs, it unexpectedly decreased in the Jasmine dormitory (the most expensive). In general, students residing in female dormitories spent more than their compatriots in male dormitories.

Students' consumption patterns based on gender, years of study, and type of dormitory were analyzed using various tests—*t*-test and ANOVA with Tukey's Test. The former test was used for gender, and the latter for years of study and type of dormitory. Table 3 shows that there were substantial differences in consumption patterns between genders. The higher values were recorded uniformly for females, except for expenditures on sports where males outdid the females.

Table 3. *T*-test for Equality of Means Results on Student Consumption Patterns Based on Gender

	<i>t</i>	<i>df</i>	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Food	-2.68	439.00	.008	-36.13	13.48	-62.63	-9.64
Drinks	-2.53	439.00	.012	-11.98	4.74	-21.30	-2.66
Snacks	-5.58	439.00	.000	-33.35	5.97	-45.09	-21.61
Transportation- Owned	-.06	439.00	.953	-.24	4.14	-8.39	7.90
Transportation- Public	-.43	439.00	.667	-2.13	4.94	-11.85	7.59
Phone	-2.04	439.00	.042	-6.67	3.27	-13.11	-.24
Internet	-5.20	439.00	.000	-30.10	5.79	-41.47	-18.73
Entertainment	-3.28	439.00	.001	-19.14	5.83	-30.61	-7.68
College supplies	-2.28	439.00	.023	-19.11	8.39	-35.60	-2.62
Cosmetics and Toiletries	-6.28	439.00	.000	-42.43	6.76	-55.71	-29.14
Accessories	-2.03	439.00	.043	-12.17	5.98	-23.93	-.41
Clothing	-1.22	439.00	.224	-10.29	8.46	-26.91	6.33
Hobby	-.01	439.00	.996	-.03	4.67	-9.20	9.14
Sports	2.79	439.00	.005	8.89	3.18	2.63	15.14

It is found that females spent significantly more on food, drinks, snacks, phone credit, Internet, entertainment, college supplies, cosmetics and toiletries, and accessories, while there were no differences in consumption patterns for transportation, clothing, and hobbies. Female students spent more money on average to buy food, drinks, and snacks monthly (Rp. 137.670, Rp. 46,130, and Rp. 66,930, respectively) compared to male students (Rp. 101.540, Rp. 34.150, and Rp. 33.580). It should be noted that females spent two times more on snacks than male students. This finding is supported by YouGov (2015) and Nieburg (2013). Further, it is found that female students also spend more money monthly than males to buy phone credit (Rp. 28.320 vs. Rp. 21.640), Internet (Rp. 74.560 vs. Rp. 44.460), entertainment (Rp. 36.030 vs. Rp. 16.890), and school supplies (Rp. 74.280 vs. Rp. 55.170). A similar expenditure pattern was observed in a previous study completed by Mulyani (2015).

Certainly, average monthly expenditure for cosmetics and toiletries were greater for female students (Rp. 62.020) than for males (Rp. 19.590). Female students also spent more than males for accessories (Rp. 33.370 vs. Rp. 21.190). Conversely, male students spent more on sports than females (Rp. 15.190 vs. Rp. 6.310), which accords with previous findings (Cerar, Kondrič, Ochiana, & Sindik, 2017). Therefore, according to the *t*-test, H_0 was accepted and H_1 was rejected.

Meanwhile, ANOVA analysis of data on consumption patterns of students by year of study showed a significant difference ($p = .14$) only for food consumption. The details are given in Table 4. Senior students spend more for food than freshmen. No other differences in consumption patterns were found. Thus, H_0 was rejected and H_1 was accepted.

Table 4. Student Food Consumption Patterns Based on Year of Study (Tukey's HSD)

Years of Study	<i>N</i>	Subset for alpha = 0.05
Freshmen	195	106.15 ^a
Sophomore	109	127.40 ^{ab}
Junior	80	132.65 ^{ab}
Senior	57	171.40 ^b
Sig.		0.56

Note: Figures followed by the same letter are not significantly different.

Lastly, different consumption patterns were found among students based on type of dormitory in respect to food, drinks, snacks, public transportation, phone, Internet, entertainment, cosmetics and toiletries, hobby, sports ($p < .05$). On the other hand, no differences were found in terms of self-owned transportation, college supplies, accessories, and clothing. Detailed analysis of these differences (Table 5) clearly showed that the Genzet dormitory students differed from the Guest House, Jasmine, and Annex students. While Annex students are different from Bougenville, Crystal and Edelweiss, they are not different from students from the other dormitories. Overall, the consumption of students who lived in the Annex dormitories was higher than others, while those who live in Genzet was the lowest. Furthermore, students who lived in the Guest House, Jasmine, and Annex dormitories spent more for food (more expensive accommodation), presumably on account of getting larger allowances from their parents.

Table 5. Differences (Tukey's HSD) in Food Consumption Patterns Based on Type of Dorm

Dormitory	<i>N</i>	Food	Drinks	Snacks
		Subset for alpha = 0.05	Subset for alpha = 0.05	Subset for alpha = 0.05
Genzet	30	50.67 ^a	12.90 ^a	9.80 ^a
Bougenville	15	100.00 ^{ab}	27.00 ^{ab}	37.33 ^{ab}
Crystal	104	102.55 ^{ab}	36.02 ^{ab}	40.17 ^{ab}
Edelweiss	147	109.53 ^{ab}	41.29 ^{ab}	65.11 ^{bc}
Jasmine	77	158.7 ^{bc}	42.34 ^{ab}	60.10 ^{bc}
Guest House	25	158.40 ^{bc}	51.88 ^{bc}	34.68 ^{ab}
Annex	43	209.37	76.16 ^c	95.70 ^c
Sig.		0.48	0.1	0.3

Drink consumption for students at the Genzet dormitory was different from Guest House and Annex, but it was not different from students who lived in other dormitories. While Annex students differed in drink consumption with their compatriots in Genzet, Bougenville, Crystal, Edelweiss, and Jasmine, they were not different from students in the Guest House dormitory. Furthermore, the snacks consumption pattern of students from Genzet dormitory was different from those who lived in the Jasmine, Edelweiss and Annex dormitories, although there were no differences with students from other dormitories. While students from the Annex dormitory had differences in the consumption

of snacks from those who lived in Crystal, Bougenville, Guest House, and Genzet dormitories, they were statistically not different from students who lived in other dormitories.

Table 6. Differences (Tukey’s HSD) in Non-Food Consumption Patterns Based on Type of Dorm

Dormitory	N	Public Transportation	Phone	Internet
		Subset for alpha = 0.05	Subset for alpha = 0.05	Subset for alpha = 0.05
Genzet	30	5.33 ^a	10.33 ^a	9.43 ^a
Bougenville	15	10.87 ^{ab}	25.27 ^{ab}	43.33 ^{ab}
Crystal	104	22.56 ^{abc}	23.40 ^{ab}	52.44 ^{bc}
Edelweiss	147	21.26 ^{abc}	25.80 ^{ab}	71.71 ^{bc}
Jasmine	77	16.91 ^{ab}	28.78 ^{ab}	78.44 ^{bc}
Guest House	25	42.24 ^{bc}	27.88 ^{ab}	53.28 ^{bc}
Annex	43	54.14 ^c	37.14 ^c	88.26 ^c
Sig.		0.74	0.20	0.15

Dormitory	N	Entertainment	Cosmetics & Toiletries	Hobbies
		Subset for alpha = 0.05	Subset for alpha = 0.05	Subset for alpha = 0.05
Genzet	30	1.67 ^a	13.17 ^a	4.67 ^a
Bougenville	15	5.33 ^a	40.47 ^{ab}	0.00 ^a
Crystal	104	18.08 ^{ab}	21.35 ^{ab}	8.99 ^a
Edelweiss	147	24.08 ^{ab}	65.00 ^b	12.65 ^a
Jasmine	77	48.77 ^{bc}	60.45 ^{ab}	16.23 ^{ab}
Guest House	25	30.20 ^{abc}	20.00 ^{ab}	48.40 ^b
Annex	43	64.77 ^c	62.14 ^b	22.09 ^{ab}
Sig.		0.34	0.05	0.39

In terms of public transportation, there were differences in consumption patterns between Genzet, Guest House, and Annex students, but they were not different from students in other dormitories. Students from the Annex dormitory were different from those who lived in Genzet, Bougenville, and Jasmine.

Differences in telephone credit consumption patterns existed between Genzet and Annex students, but no differences were found with students from other dormitories. Meanwhile, students from the Annex dormitory had differences in telephone credit consumption from all students from other dormitories. Varied results appeared in the consumption of Internet packages where Genzet students differed from students from Crystal, Guest House, Edelweiss, Jasmine, and Annex dormitories, but were not different from students from other dormitories. Students from the Annex dormitory differed in consumption of Internet packages with students from Bougenville and Genzet. Further, consumption for entertainment was different for students who lived in Genzet's dormitories from Jasmine, and Annex's dormitory students, but it was not different from students in other dormitories. Then, Annex dormitory students displayed different consumption for entertainment with students from Edelweiss, Crystal, Bougenville, and Genzet dormitories, as well as Bougenville dormitory students having different entertainment consumption from students from Jasmine and Annex.

For cosmetics and toiletries, Genzet students were statistically different from students from Annex and Edelweiss dormitories, but they were not different from students from others who lived in other dormitories. Finally, there was a difference in consumption pattern of hobbies from Bougenville students against those who lived in the Guest House dormitory. These Guest House dormitory students had different consumption patterns compared with Edelweiss, Crystal, Genzet, and Bougenville students.

While in the ANOVA test, sports consumption was found to be significant ($p < .05$), yet in Tukey’s Test, no differences were found among students. To conclude, no statistical differences in consumption were found for the categories of personal transportation, accessories, college supplies, clothing, and sports for students who lived in the seven dormitories on campus. Thus, H_0 was accepted and H_1 was rejected. However, because there were differences in the consumption patterns of

dormitory students in terms of food, drinks, snacks, public transportation, telephone, Internet packages, entertainment, cosmetics and toiletries, as well as hobbies, H_0 was rejected and H_1 was accepted for these categories.

Overall comparisons showed that students living in the Annex dormitory had the highest average food and non-food expenses compared to other dormitories. In contrast, students who lived in the Genzet dormitory had the least average expenditure on food and non-food items. For students who lived in Genzet, this is understandable because they were mostly working students, so they ate more often in the campus cafeteria, and their other expenses were not as much as students from the other dormitories. However, what was surprising was the average consumption of female students living in Annex dormitory was greater than female students who lived in Jasmine dormitory, which was more expensive. This might have happened on account of the following: the location of the Annex dormitory was closer to outlets for buying off-campus food. Alternatively, Jasmine female students may have been visited more often by families bringing food from home.

Conclusions

The results of this study provide some advice or input for students, parents, and the university. For students, especially those living in dormitories, it is important to know their monthly consumption patterns so that they can manage their monthly allowances better. Furthermore, for parents, knowing the consumption patterns of their children can provide an idea of how their children live in the dormitories and their monthly consumption needs. For the university, the consumption patterns of students who live in dormitories provides important information allowing provision for their needs on campus so that they do not go out often to buy food and non-food items.

The results of the *t*-test and ANOVA—together with the Tukey's Test—showed differences in consumption patterns of dormitory students based on gender, years of study, and type of dormitory. It was found that female students generally displayed a higher consumption pattern than males, with non-food being higher than food consumption for both groups. Expenditure on sports was an exception, with males spending more than females. It was concluded that female students had a greater number of needs to satisfy. Generally, those students who lived in cheaper dormitories tended to spend less than those in the more expensive ones. Senior students tended to spend more on food, and less on non-food items than other cohorts.

Limitations

There are several limitations of this research, such as the short time span (one semester) over which data was gathered. Gathering data for at least two semesters would have allowed student consumption patterns to be better mapped. In addition, the sampling method used was a convenience sampling method. Another limitation may have been the combination of several consumption items into one variable. For further research, it may be advisable to further detail consumption items, especially for non-food items, so that a more comprehensive understanding is gained. Future studies might also add responses from students who lived outside of campus to gain better insights regarding their consumption patterns, and make comparisons with dormitory students.

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