ihses 2020
July 15-19 Washington, DC, USA

Proceedings of International Conference on

Humanities, Social and Education Sciences

July 15-19, 2020 Washington, DC, USA

Editors

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istes Organization

www.ihses.net

Volume 1, Pages 1-103

Proceedings of International Conference on Humanities, Social and Education Sciences

ISBN: 978-1-952092-08-4

Edited by: Richard Thripp & Ismail Sahin

Articles: 1-10

Conference: International Conference on Humanities, Social and Education Sciences (iHSES)

Dates: July 15-19, 2020

Location: Washington, DC, USA

Conference Chair(s):

Dr. Richard Thripp, University of Central Florida, USA

Dr. Vaughn M. Bradley, Walden University, USA

The submissions are subject to a double-blind peer review process by at least two reviewers with expertise in the relevant subject area. the review policy is available at the conference web page: www.ihses.net

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The Gaming Element Design of an Innovative Financial Learning Tool for Young Adult Learners

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Abstract: Empirical research methods were used to study the motivation factors that may persuade young adults in Thailand to learn finance. We aim to clarify the stimulus factors to acquire financial knowledge and stimulus factors to change financial behavior and demonstrate their importance to incorporate in the game design by integrating psychological theory and empirical findings from the survey of 135 students of Provincial Electricity Authority Electric Vocational School (PEAEVS) aged between 16–19 years old during April 2020. All responses were analyzed through factor analysis and regression analysis methods. The empirical study found seven factors that motivate and effectively facilitate financial education of these young adult learners: 1) awareness for the need of financial skills, 2) awareness for financial planning, 3) future uncertainty, 4) financial satisfaction, 5) communities support, 6) income satisfaction and 7) keeping track of expenses and budgeting. Regression analysis concluded that the need for competency and income satisfaction are highly related to willingness to study financial skills and change financial behavior. The result will be integrated into a framework for further develop innovative financial learning tools.

Keywords: Financial literacy, gamification in finance, motivation, game design, financial education

Introduction

Recent literature on the subject of financial literacy showed that people with insufficient financial knowledge are more likely to make financial mistakes than those who have (Hung, Parker, & Yoong, 2009). International Assessment of Adult Competencies (PIAAC) surveyed adults in more than twenty member countries and revealed that literacy and numeracy skills, prompting the government to find a way to improve it (Bureau, 2015). In Thailand, according to a survey conducting by the Bank of Thailand and the National Statistical Office, Thai people scored 61.0 in financial skills, which included financial literacy, financial behavior, and financial attitude. The score is below the OECD average (Bank of Thailand, 2016). Also, it seems the non-performing personal loan increase continuously in the past decade, especially among the young adult borrowers in Thailand (Chantarat S., Lamsam A., & B., 2017). Having bad debt at a young age could affect future investment capability and hampers the growth and stability of the overall economy. Thus, financial literacy is recognized to be the key to improvement to make Thais achieve financial wellbeing.

Our objective is to shed some light on the factors and motivations that drive learners to study finance. The hypothesis is that motivating factors are identified and included in the design of the financial learning tool; the tool will be able to draw the attention of learners and finally lead to the success in financial education. The specific design of game elements will also be addressed from the empirical study on the motivation of the target group to learn finance and change behavior. There are three main aspects to consider:

- What stimulate people to learn new things?
- What exactly is financial literacy, and how it influences financial wellbeing?
- How to design an effective, innovative financial learning tool?

Supathanarangsri, T., Tanlamai, U., Chandrachai, A., & Inchamnan, W. (2020). The Gaming Element Design of an Innovative Financial Learning Tool for Young Adult Learners. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 1-10), Washington, DC, USA. ISTES Organization.

To achieve our purpose, we conducted an empirical study based on a survey of 135 students from Provincial Electricity Authority Electric Vocational School (PEAEVS) aged between 16–19 years old collected during April 2020. The data is analyzed to find relations between factors and converted into game elements of an innovative financial learning tool. The remaining of this paper is organized as follows: The literature review, Section 2, discusses the concepts of need satisfaction from the psychological perspective in the context of motivation to acquire knowledge. Then it touches upon the scopes and definitions of financial literacy, financial well-being, with the specific focus on the knowledge of personal finance needed for young adults. Methodology in Section 3 describes data and methods used to identify factors that motivate the study of financial skills and the change in the financial behavior of the target group. The results are shown in Section 4, with a proposed research framework for further study. The last section is the recommendation and concluding remarks.

Literature Review

Stimulus Factors to Acquire Knowledge

Stimulus factors used to draw attention are examined in two aspects. One is the factors that push people to learn new things, which in this case, financial knowledge. The other is the factors that help them change their behavior to design an interactive education game tailored to give practical knowledge and presumably leads to the personal financial wellbeing of the learners.

From the psychological point of view, how people behave is motivated by their unfulfilled needs. One of the most popular needs theories is Maslow's hierarchy of needs theory. He proposed that motivation is the result of a person's attempt at fulfilling five basic needs: physiological, safety, social, esteem, and self-actualization. As the name indicates, these needs exist in a hierarchical order meaning that lower-level needs must be met before higher-level needs (Maslow, 1943). On the other hand, the already satisfied need can no longer act as a motivator.

Alderfer (1969) further developed Maslow's hierarchy of needs by categorizing the five-level needs into Existence needs, Relatedness needs, and Growth needs, thus named it ERG theory (Alderfer, 1969). McClelland (1978) stated that all individuals are driven by three motivators: the need for achievement, the need for affiliation, and the need for power. Of these three, which one will be our dominant motivator, largely depends on our life experiences and culture.

Another social psychology theory that aims to describe motivation and behavior is the theory of planned behavior (Ajzen, 1985). It posits individuals make logical, reasoned decisions to engage in specific acts by evaluating the information available to them. Any intentions are determined by a combination of attitude toward the behavior, subjective norms, and perceived behavioral control. In contrast, perceived behavioral control refers to the person's belief that the behavior in question is under their control or not too difficult to execute. This concept is important in designing a learning experience to make learners feel the appropriate level of confidence in their ability to continue with the task. Self-determination theory is a major theory of the new century. It separated intrinsic motivations, the drive to do what one finds interesting, enjoyable, and fulfilling, from extrinsic motivation, which is what one is forced to do. Intrinsic motivation facilitates higher concentration, effort, and task completion. Deci and Ryan (2000) stated three psychological needs that fuel intrinsic motivation underlining choices people make, include competence, relatedness, and autonomy (Ryan & Deci, 2000). These needs are the key to designing a learning experience for the new generation. Competence is the individual's need to feel that they are capable and mastering something while relatedness is the need to make a connection and sharing what they are doing. Autonomy, which is what the new generation valued highly, refers to the need to feel in charge of engaging. Providing the conditions and environments can support the fulfilling of these three needs which in turns will foster the highest quality forms of motivation, which is self-determination.

Apart from factors that influence people to learn, understanding the factors that push them to change behavior is equally important in designing a learning tool. The report Consumer Financial Protection Bureau (2015) defined four types of desirable financial behaviors that must be instilled to consumers (Bureau, 2015):

- Effective routine money management to control impulsive buying;
- Constant research and knowledge-seeking to support informed financial decision-making;
- Financial planning and goal setting; and

- Following through on financial decisions and planning.

Financial Literacy

Financial literacy is loosely defined as knowledge and skills to manage money effectively. However, there are other definitions. For example, the President's Advisory Council on Financial Literacy (PACFL) defined financial literacy as "the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial wellbeing" (Jump$tart Coalition cited in (Hung et al., 2009)). Similarly, OECD defined financial literacy as: "a combination of awareness, knowledge, skill, attitude, and behavior unnecessary to make sound financial decisions and ultimately achieve individual financial wellbeing" (Atkinson & Messy, 2011). Lusardi, Mitchell (2011) and Huston (2010) define financial literacy as knowledge of financial concepts, aptitude for managing finance, acquiring financial making decision skills, and having confidence in planning (Huston, 2010; Lusardi & Mitchell, 2011).

To be more precise, many works agreed that financial literacy includes the knowledge on interest compounding, inflation, risk diversification, cash-flow management, saving, and investment (Atkinson & Messy, 2011; Hilgert, Hogarth, & Beverly, 2003; Lusardi & Mitchell, 2011). Also, the definition should include the ability to obtain reliable information, ability to process financial information to make an appropriate financial decision, and how to execute financial decisions, monitoring, and adapting to stay on track (Bureau, 2015). However, the proper measurement of financial literacy is debatable, depending on its goal. The United States Consumer Financial Protection Bureau (CFPB) concludes that the best way is to look at its level to improve individual financial wellbeing (Bureau, 2015).

Financial Well-Being

Financial literacy aims to provide financial wellbeing for a person. The United States Consumer Financial Protection Bureau (CFPB) describes financial wellbeing as security and freedom of choice both in the present and in the future. To be more specific, financial wellbeing is having control over day-to-day finances, having the capacity to absorb a future financial shock, having enough financial freedom to enjoy life, and being on track to meet the financial goal (Bureau, 2015).

Evidence suggests that well-informed, financially educated consumers can make better decisions and be in a position to increase their economic security and wellbeing (Hilgert et al., 2003). In her work, O'Neill (2002) explained that a financial wellbeing person is the one who must have the knowledge and understanding of the following: the ability to practice financial goal setting, net worth calculation, cash flow analysis, spending plan, credit card analysis, income tax analysis, insurance analysis, retirement planning, and estate planning. Moreover, it is obvious that to be literate in finance does not automatically mean they will be better off. The education provided must teach the knowledge and instill a healthy routine to make people capable and eventually experienced in managing their financial situation effectively (O'Neill, 2002).

Game Design Elements

Game design elements are the foundation of the gamification application (Deterding, Khaled, Nacke, & Dixon, 2011). In an education context, gamification was widely adopted to both couple with formal education or as the stand-alone learning tool as it can engage, motivate, influence and reinforce learning-related behavior, desired skills and attitude (Buckley & Doyle, 2016; Dicheva, Dichev, Agre, & Angelova, 2015; Landers, 2014). The application of gamification in education is gaining ground in various subjects from Computer Science, Information Technology, game programming, mathematics, science, engineering, (Dicheva et al., 2015), medical (McCoy, Lewis, & Dalton, 2016) and finance (Bayuk & Altobello, 2019).

Creating a game where the player is in control of their financial decision avatars is viable to teach basic and advanced financial skills. The players will be able to choose their financial choices and see their results. These financial decisions will include most of the decisions they would make today and the near future living of their real-life situation.

Method

The research utilized a quantitative research methodology to understand the factors that motivate learning and change financial behavior. These factors will be an integral part of the design of a game that can effectively improve the financial wellbeing of the target group. The methodology comprises three phases.

Phase 1 - Understanding financial literacy, related concepts and factors, and the target population

Upon reviewing the related literature and research, the scopes and factors that influence financial education and behavioral changes among young adults were explored. A group of financial experts and personal financial consultants were interviewed, focusing on their teaching experiences. Representatives of the target groups were also interviewed to understand their basic financial situation, knowledge, and expectation in life. As a result, a preliminary set of questionnaire was developed to include questions about personal characteristics and the factors that motivate financial education and behavioral changes. The questionnaire was inspected by three experts in the field of finance using Index of Item – Objective Congruence (IOC). The experts rated each question and filled in open-ended questions to provide more in-depth analysis and opinion. We analyzed the data with descriptive statistics such as median and quartile deviation, the absolute value between mode and median, and determining indicators with average percentages.

Phase 2 - Selection and assessment of stimulus factors that motivate financial education and behavioral changes

The questionnaire was tested with a group of 30 students of Provincial Electricity Authority Electric Vocational School (PEAEVS) having similar characteristics as the target population. We tested reliability using Cronbach's Alpha Coefficient. Stimulus factors that motivate knowledge acquisition and financial behavioral change were measured by fourteen questions and eleven questions respectively in three different dimensions – financial attitude, social norm, and locus of control – internal and external factors. The Coefficient Alphas for Stimulus factors that motivate financial education is 0.832; Stimulus factors that motivate behavioral changes = 0.716. Both values are higher than 0.7, indicate the internal consistency of the questions.

Phase 3 - Validation of the stimulus factors to acquire knowledge and financial behavior change to integrate into gaming elements of the financial education tool

The questionnaire was administered to 135 students of PEA Electric Vocational School (PEAEVS). The collected data were analyzed with descriptive statistics, Pearson's coefficient, and Factor Analysis. We also examine the relationship between the stimulus factors and the intention to use a financial learning tool to promote financial literacy

Results

Factor Analysis of data from 135 PEAEVS was performed with Varimax rotation on the stimulus factors that motivate financial skills acquisition and behavioral change. The Kaiser-Mayer-Olkin (KMO) of the data was 0.772, indicating that the technique used was appropriate (see Table 1). Bartlett's Test of Sphericity was found to support the model at the 0.000 level of significance.

Table 1. Kaiser-Mayer-Olkin (KMO) and Bartlett's Test of Sphericity of the Data

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.772
Bartlett's Test of Sphericity	Approx. Chi-Square	963.529
	df	300
	Sig.	<.001

The Factor Analysis found seven factors with the Eigenvalues of greater than one, accounting for the cumulative variance of 59.793% (see Table 2).

Table 2. Factor Analysis of the Data

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	5.649	22.596	22.596	5.649	22.596	22.596	2.682	10.729	10.729
2	2.078	8.312	30.909	2.078	8.312	30.909	2.292	9.168	19.897
3	1.812	7.249	38.158	1.812	7.249	38.158	2.287	9.149	29.046
4	1.578	6.312	44.469	1.578	6.312	44.469	2.242	8.968	38.014
5	1.378	5.513	49.982	1.378	5.513	49.982	1.971	7.883	45.897
6	1.317	5.270	55.252	1.317	5.270	55.252	1.939	7.756	53.654
7	1.135	4.542	59.793	1.135	4.542	59.793	1.535	6.140	59.793
8	.975	3.900	63.693						
9	.886	3.544	67.237						
10	.837	3.349	70.586						
11	.801	3.206	73.792						
12	.756	3.023	76.815						
13	.656	2.625	79.440						
14	.642	2.567	82.007						
15	.587	2.348	84.355						
16	.558	2.230	86.586						
17	.492	1.968	88.553						
18	.483	1.932	90.485						
19	.456	1.825	92.310						
20	.393	1.574	93.884						
21	.374	1.496	95.380						
22	.346	1.384	96.764						
23	.308	1.231	97.994						
24	.265	1.059	99.054						
25	.237	.946	100.00						

Rotated component matrix extracted stimulus factors that motivate and effectively facilitate financial education of these young adult learners from 25 indicators into 7 factors:

1) the awareness for the need of financial skills,
2) the awareness for the need for financial planning,
3) the future uncertainty,
4) the financial satisfaction,
5) the community's support,
6) the income satisfaction, and
7) the recording of income and expenditure (see Table 3).

Table 3. Factor Analysis with Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
Awareness for the need of financial skills							
Believe that financial knowledge can be learn and apply in real life	.760	-.042	.133	.005	.239	-.039	-.197
Plan to be an expert/skillful in finance	.733	.143	.219	-.032	-.105	-.094	.087
Expect higher income in the future	.592	.097	-.015	.376	.020	.027	.100
Interested in financial knowledge that is related to daily life	.502	-.093	.378	.128	.389	.189	-.063
Awareness of the need for financial planning							
Always have plan for saving, spending, and incurring debt	.053	.809	.020	.047	-.005	-.055	.103
Have regular spending plan and avoid impulsive spending	-.011	.716	.196	-.020	.065	.144	-.164
Always have plan and careful decision about financial matter to be safe from risk	-.151	.580	.396	.115	.190	-.021	.067
Always keep record of income and expenditure	.389	.549	-.207	-.067	.093	.187	.000
Awareness of the need for financial management							
Always research before making financial decision	.325	.205	.648	.176	-.034	-.135	.085
Have own method of saving	.076	.174	.619	-.163	.341	.033	-.179
Concern about economic situation e.g. rising price of goods	.179	.043	.532	.163	.117	.173	.221
Interested to learn financial knowledge with social group(s) e.g. worker union	-.006	.108	.485	.361	.079	.360	-.256
Interested to acquire financial knowledge if convenient	.393	-.066	.398	.383	.071	.245	.013
Satisfy that current income is sufficient for spending	.116	.045	.013	-.766	-.004	.164	-.204
Income satisfaction							
Want to have up-to-date financial knowledge and skills	.231	.099	.141	.608	.302	.196	-.136
Believe that financial knowledge will lead to better financial behavior	.334	.059	.202	.518	.373	.050	-.222
Have financial target(s) e.g. saving to get married or have a kid	.253	.392	.287	.467	-.123	.191	.122
Interested in investment for wealth accumulation	.384	-.064	.342	.404	.110	.248	-.114
Communities support							
Consider working community a factor that influence positive change in financial behavior	.085	-.023	.043	.178	.719	.032	.248
Consider family the main factor that influence positive change in financial behavior	.045	.171	.212	.010	.696	.070	.060
Awareness of future uncertainty							
Worried about being out of work	-.085	.039	.061	.024	.016	.782	-.023
Worried about saving for retirement	.096	.345	.022	.120	.317	.584	.053
Will change job if offered better payment	-.017	-.176	.220	-.212	-.370	.453	.356
Financial status satisfaction							
Requested by current employer to improve financial behavior	-.145	.021	-.003	.032	.249	-.073	.760
Satisfy that current income is sufficient for spending	.230	.059	.038	.065	.004	.509	.606

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 24 iterations.

Table 4 shows comparison between stimulus factors from literature and factor analysis. Indicators were grouped as new factors e.g. worried about being out of work from stimulus factors to acquire knowledge was grouped as an indicator of awareness of future uncertainty, always research before making financial decision from stimulus factors to change behavior was grouped as an indicator of awareness of the need for financial management.

Table 4. Comparison between Stimulus Factors from Literature and Factor Analysis

Factors from Literatures	Factors from Factor Analysis
Stimulus factors to Acquire Knowledge	**Awareness for the need of financial skills**
Concern about economic situation e.g. rising price of goods	Believe that financial knowledge can be learn and apply in real life
Worried about being out of work	Plan to be an expert/skillful in finance
Interested to learn financial knowledge with social group(s) e.g. worker union	Expect higher income in the future
Interested in investment for wealth accumulation	Interested in financial knowledge that is related to daily life
Have own method of saving	**Awareness of the need for financial planning**
Satisfy that current income is sufficient for spending	Always have plan for saving, spending, and incurring debt
Worried about saving for retirement	Have regular spending plan and avoid impulsive spending
Interested in financial knowledge that is related to daily life	Always have plan and careful decision about financial matter to be safe from risk
Believe that financial knowledge can be learn and apply in real life	Always keep record of income and expenditure
Plan to be an expert/skillful in finance	**Awareness of the need for financial management**
Expect higher income in the future	Always research before making financial decision
Not satisfy with current financial status	Have own method of saving
Will change job if offered better payment	Concern about economic situation e.g. rising price of goods
Interested to acquire financial knowledge if convenient	Interested to learn financial knowledge with social group(s) e.g. worker union
Stimulus factors to Change behavior	Interested to acquire financial knowledge if convenient
Always research before making financial decision	Satisfy that current income is sufficient for spending
Always keep record of income and expenditure	**Income satisfaction**
Have regular spending plan and avoid impulsive spending	Want to have up-to-date financial knowledge and skills
Always have plan for saving, spending, and incurring debt	Believe that financial knowledge will lead to better financial behavior
Always have plan and careful decision about financial matter to be safe from risk	Have financial target(s) e.g. saving to get married or have a kid
Have financial target(s) e.g. saving to get married or have kid	Interested in investment for wealth accumulation
Consider family the main factor that influence positive change in financial behavior	**Communities support**
Consider working Community a factor that influence positive change in financial behavior	Consider working community a factor that influence positive change in financial behavior
Requested by current employer to improve financial behavior	Consider family the main factor that influence positive change in financial behavior
Believe that financial knowledge will lead to better financial behavior	**Awareness of future uncertainty**
Want to have up-to-date financial knowledge and skill	Worried about being out of work
	Worried about saving for retirement
	Will change job if offered better payment
	Financial status satisfaction
	Requested by current employer to improve financial behavior
	Satisfy that current income is sufficient for spending

These seven factors explained 13.6% of the total variance in the intention to use game as financial education tool, with statistical significance ($p < 0.05$) (Table 5 and Table 6).

Table 5. Model Summary of the Data

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.369[a]	.136	.089	.95463415

Table 6. Analysis of Variance of the Data

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.262	7	2.609	2.863	.008[b]
	Residual	115.738	127	.911		
	Total	134.000	134			

Coefficients of regression analysis indicates that not all standardized coefficients are significant ($p<0.05$). There are two factors; the need for competency and income satisfaction, that have a relationship with the intention to use the game as a financial educational tool in a negative way (see Table 7). A possible explanation is that those who plan to be an expert in finance do not regard educational game as a suitable mean to achieve their goals.

On the other hand, those who are unsatisfied with their income would be keener to use a game as their financial learning tool. Therefore, to achieve the goal of increasing target group's financial literacy, a game designer would emphasize in basic financial knowledge e.g. saving, spending, planning etc. to draw attention of this target group. In other word, these two factors must be highlighted in the framework when designing an innovative financial learning tool for young adult learners.

Table 7. Coefficients of the Data

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.050E-16	.082		.000	1.000
	Awareness for the need of financial skills	-.204	.082	**-.204**	-2.471	**.015**
	Awareness of the need for financial planning	.008	.082	.008	.103	.918
	Awareness of the need for financial management	-.092	.082	-.092	-1.113	.268
	Income satisfaction	-.250	.082	**-.250**	-3.032	**.003**
	Communities support	.132	.082	.132	1.595	.113
	Awareness of future uncertainty	-.070	.082	-.070	-.854	.395
	Financial status satisfaction	-.039	.082	-.039	-.468	.640

The stimulus factors found in the preceding analyses are used in the development of an innovative financial learning tool, a 'financial game,' for young adult learners. The game should effectively encourage an engagement and provide a positive experience to learners. However, the personal predisposition, including the financial attitude of a learner, could affect the desirable result, which in this case, the increase of financial literacy level. The authors then propose a conceptual framework for the future research, as shown in Figure 1.

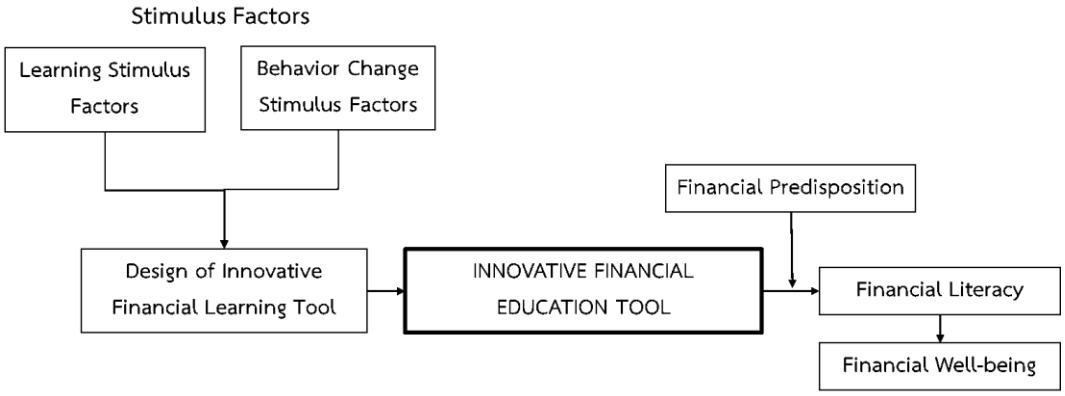

Figure 1. Proposed Conceptual Framework of Innovative Financial Learning Tool for Young Adult Learners, 2020

Conclusions and Recommendations

This paper aims to understand the stimulus factors affecting the motivation to acquire financial knowledge and change the financial behavior of young adults. Results indicated that educators and game developers should focus on the need for competency and income satisfaction factors. They are the most significant factors in designing the educational tools that will better engage young adult learners to improve their financial literacy and enable them to apply this knowledge in real-life situations. The financial game should introduce activities that can help change people's behavior and teach skills regarding financial literacy. Both intrinsic motivation and extrinsic motivation are equally important. Educators must carefully consider when designing the learning tools or methods to promote a positive learning experience, motivate action, and engage people to learn and make more confident and efficient decisions.

Carefully designed games that focus on intrinsic motivators would contribute positively to the experience of the players. This study hence provides an initial understanding of students' intrinsic and extrinsic motivations to learn finance, the complex subject that many do not want to understand to design a fun and engaging financial learning tool. Although the awareness for the need for financial skills and income satisfaction is found significant in this study, other factors identified from literature cannot be ignored entirely. The factors that deserve further attention and include in the financial game as well are the awareness for financial planning, future uncertainty, financial satisfaction, community support, and the recording of income and expenditure. In future works, the author will explore the outcome of the financial game designed following the results of this study. The motivation factors mentioned will guide the designing to create a game that provides a good experience for players and hopefully lead to an increase in financial literacy level.

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Investigation of the Relationship between Participation in Recreational Activities and Sensation Seeking among University Students

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Abstract: The aim of this study is to investigate the relationship between the quality and quantity of university students' participation in recreational activities and sensation seeking. The study was conducted among 478 university students through a causal-comparative research design. The participants were obtained through convenience sampling method which is one of the techniques of probability sampling. The study employed the Questionnaire for Participation in Recreational Activities, Leisure Satisfaction Scale and Sensation Seeking Scales to collect data for this research. In the evaluation of the data, along with descriptive statistics, Independent Samples t-Test and ANOVA were used. To determine the relationship between leisure satisfaction and sensation seeking, Pearson Correlation test and to determine the impact Regression analysis were used. The findings revealed no significant difference between leisure satisfaction and sensation seeking among university students in terms of gender and year of study. Another finding showed that, while there was a significant difference between participation in active sports, social, artistic and cultural activities and leisure satisfaction, no significant difference was found for sensation seeking. Finally, students' sensation seeking significantly affected their leisure satisfaction.

Keywords: University students, recreational activities, sensation seeking, gender

Introduction

Even though the purpose of individuals to participate in the leisure activity is different, there is a point in which all of them are common (Henderson and Bialeschki, 2005). The individual participates in them, to enjoy the leisure activity and to be satisfied as a result of this pleasure (Çelik, 2011). According to Ardahan and Yerlisu Lap (2010), leisure satisfaction, is the degree of meeting the expectations of the individual from the activities that he actively or passively participates in order to obtain health, fun, satisfaction, renewal and happiness to gain new skills, without being tied to external forces and with health, social, cultural, sports or artistic expectations participate voluntarily and without any financial benefits. De la Vega et al. (2018) suggested that recreation as a concept is a shelter of events that includes social, educational, sports and artistic pastimes.

Broadhurst (2001) mentioned the existence of numerous factors that affect our approach to recreational activities in leisure, and he stated that some of them were factors such as genetic structure, personality, family influence, teachers, peer groups, environment and nature awareness. In this context, individuals' search for Sensation in their leisure processes, has an important effect. The quest for Sensation is a personality trait associated with a tendency to take risks for various, unique, complex and intense urges. People looking for Sensation, often ignore the risk factor, or they regard the risk as a valuable reward (Zuckerman & Kulman, 2000). Zuckerman (1994) talks about the four characteristics of sensation seekers. 1- Sensation seeking and adventure seeking behavior, 2- Experience seeking behavior, 3- Conditional reflex loss, 4- Sensitivity to boring. It has been seen that there are few studies in the literature where sensation seeking and leisure satisfaction are examined together. However, the concept of "Sensation" is an important factor in satisfaction, perceived in leisure (Yerlisu Lapa, 2013).

The root of our leisure habits is based on our past, depending on the culture and geography we live in. The answer to the question of where, how, when and with which recreational activity we will spend our leisure, is shaped depending on different reasons along with the living conditions, opportunities and regional culture reasons of our era. In this context, Torkildsen (2012) shows that the Sensation perceived by individuals in their leisure, is one of the factors affecting their leisure satisfaction. He stated that these behaviors were based on traditions that have been transmitted for centuries. Some research on university youth has revealed that the vast majority of youth do not know how to spend their leisure or, that they spend these times with passive activities, but at the same time are willing to participate in many activities if possible (Torkilden, 2005). For this reason, this research was examined in terms of sensation seeking and leisure satisfaction of university students and their participation in active sports, artistic, cultural and social activities.

Tukel, Y. (2020). Investigation of The Relationship Between Participation in Recreational Activities and Sensation Seeking among University Students. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 11-15), Washington, DC, USA. ISTES Organization.

Method

In the research, the screening model was used in which the opinions of the participants or their characteristics such as interest, skill, ability and attitude were determined (Fraenkel & Wallen, 2006). The relationships between university students' participation in leisure activities, leisure satisfaction and Sensation seeking were examined in this study, based on the comparative relational scanning method which is one of the scanning models.

The sample group of the study consisted of a total of 478 university students, 212 males and 266 females, who study at different faculties of Necmettin Erbakan University and Selcuk Universities with an average age of 20.80 ± 1.45.

Data Collection Tool

The form used as a data collection tool in the research consists of three parts. The first part “Personal Information Form” was used to determine the gender, age, departments, classes and weekly leisure periods of the students. In the second part, "Leisure Satisfaction Scale" developed by Beard and Raghed (1980) and adapted to Turkish by Gökçe and Orhan (2011) was used to measure the leisure satisfaction levels of students. The scale is 5-point Likert Type and, the Cronbach Alpha internal consistency coefficient is 0.88. In the third part, the 'Sensation Seeking Scale' developed by Hoyle et al. and adapted to Turkish Culture by Çelik and Turan (2016) was used. The reliability coefficient of the one-dimensional scale was found to be .79.

Findings

When Table 1 is examined, the participants' Sensation seeking and free time satisfaction scores do not differ significantly according to the gender.

Table 1. Distribution of Scale Scores by Gender

Variables	Gender	n	Mean	Std. Deviation	t	p
Sensation Seeking	Male	212	3,16	0,69	,736	,462
	Female	266	3,12	0,59		
Leisure Satisfaction	Male	212	3,63	0,48	,358	,721
	Female	266	3,61	0,46		

When Table 2 is examined, it was observed that there was no significant difference in Sensation seeking mean scores depending on active sports ($p > 0.05$). However, there was a significant difference in leisure satisfaction mean scores depending on active sports ($p < 0.05$). Leisure satisfaction of university students engaged in active sports, is significantly higher.

Table 2.Comparison of Sensation Seeking and Leisure Satisfaction Scores according to University Students' active Sports Status.

Variables	Active Sports Status	n	Mean	Std. Deviation	t	p
Sensation Seeking	Yes	228	3,11	0,63	-,864	,388
	No	250	3,16	0,64		
Leisure Satisfaction	Yes	228	3,66	0,44	1,947	,048
	No	250	3,58	0,49		

When Table 3. is examined, it was observed that there was no significant difference in Sensation seeking mean scores depending on the participation actively in social activities ($p > 0.05$). However, a significant difference was found in leisure satisfaction mean scores depending on the participation actively in social activities (p

<0.05). Leisure satisfaction of university students participating actively in social activities, is significantly higher.

Table3. Comparison of Sensation Seeking and Leisure Satisfaction Scores by University Students' Participation in Cultural and Artistic Activities

Variables	Actively Participation in Social Activity	n	Mean	Std. Deviation	t	p
Sensation Seeking	Yes	264	3,15	0,67	,481	,631
	No	214	3,12	0,59		
Leisure Satisfaction	Yes	264	3,71	0,47	5,116	,000
	No	214	3,50	0,43		

When Table 4 is examined, it was observed that there was no significant difference in Sensation seeking and leisure satisfaction mean scores depending on active artistic and cultural activities (p> 0.05).

Table 4.Comparison of Sensation Seeking and Leisure Satisfaction Scores by University Students' Participation in Social Activities

Variables	Actively Participation in Social Activity	n	Mean	Std. Deviation	t	p
Sensation Seeking	Yes	135	3,15	0,62	,280	,780
	No	343	3,13	0,64		
Leisure Satisfaction	Yes	135	3,67	0,51	1,512	,131
	No	343	3,60	0,45		

When Table 5 is examined, it was found that the correlation coefficients between the participants' leisure satisfaction scale and the Sensation seeking scores scales are positive and moderately significant (p <0.05).

Table 5. Correlation between Participants' Leisure Satisfaction and Sensation Seeking

		Sensation Seeking	Leisure Satisfaction
Sensation Seeking	Pearson Correlation	1	,260**
	-p-		,000
Leisure Satisfaction	Pearson Correlation	,260**	1
	-p-	,000	

**. Correlation is significant at level 0.01 (2-tailed).

Discussion and Conclusions

In this study, leisure satisfaction and Sensation levels of university students were examined according to their participation in active sports, cultural and art activities and social activities. According to the research findings, no difference was found in Sensation and leisure satisfaction scores by gender. These findings are similar to the research results of Ardahan and Yerlisu Lap (2010), VongTze (2005). The students are satisfied and excited about their leisure activities, regardless of their gender. However, Sensation seeking behavior of men is generally observed at higher levels in the literature than women. Ewert et al. (2012) stated in their study on Sensation recreation participants, that female participants tend to seek less Sensation than male participants, but this difference cannot be explained by their skill or dedication levels.

Another finding reached in this study is that, leisure satisfaction varies significantly according to the participation of university students in active sports, cultural and artistic activities and social activities. It has been observed that the participants who perform active sports, artistic, cultural and social activities, provide a high level of satisfaction from leisure. However, no significant relationship was found between participation in sports, artistic, cultural and social activities and sensation seeking.

According to Kalkan (2012), it was found that individuals participating in various leisure activities feel happier, healthy and strong and relaxed after the event experience and they have increased their self-confidence and are socialized as a result of experiences. As a result, the participants who spend their leisure actively with artistic, social and cultural events by participating in games and physical activities, leisure satisfaction levels are significantly higher. Significant relationships between students' attitudes and activity levels in leisure activities was found in a study by Akyürek et al. (2018) which was examining leisure satisfaction of the university students. Students who participate in leisure activities and provide leisure satisfaction, develop their social, physical and mental skills which they can use later in school-related activities and, feel healthy as part of a group and, build healthy relationships with other people and, overcome some difficult tasks.

The final finding of this study is that there is a meaningful relationship between participants' leisure satisfaction and sensation. These findings are similar to the research results of Kaas (2016). Positive and significant correlations were obtained between the two variables in this study, which the participation of university students in recreational activities and their leisure satisfaction and sensation levels were examined (Kaas, 2016). When the literature is examined, it has been observed that there are studies that show the relationship between leisure and life satisfaction and the sensation seeking on adults (Oishi, Schimmack & Colcombe 2003; Stegman 2011). Stegman (2010) explained the variables that may be associated with the sensation seeking as age, gender, national differences, racial differences, socio-economic status, leisure, occupation and performance and, that the variables that affect the quest for sensation, are age and gender. As a result, it was determined that students 'participation in active sports, artistic, cultural and social activities in leisure had a positive effect on individuals' leisure satisfaction.

In addition, it was concluded that there was a significant positive relationship between students' leisure satisfaction and sensation seeking behavior. In this study, it is aimed to describe the relationships between individuals in the university sample and leisure satisfaction and sensation seeking variables according to their participation in recreation activities and, this is very important in terms of enlighten future studies on this subject. In future studies, the data of the research can be collected from larger samples and the analysis can be repeated and, the generalizability and validity of the results obtained from the research can be increased.

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Understanding Catabolism: An Examination of Zhang Zihe's Purgation Theory

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Abstract: The Song Jin Period of Chinese History was a transformative time in many areas of society resulting in a rich and multifaceted historical interweave. The medical academic schools of the Song Jin Period represent a flowering of development and re-interpretation of the theories of Traditional Chinese Medicine. Complex social forces had combined to drive an intellectual revolution in the understanding and application of treatment principles. Zhang Zihe was the core scholar within an interpretive approach that came to be known as the School of Purgation. This method stood in opposition to the rampant use of tonic medicines instead arguing that purging or draining would better manage disease. Zhang was considered highly influenced by the *Yellow Emperor's Inner Cannon* (*Huangdi Neijing*), the *Yellow Emperor's Cannon of Eighty One Difficulties* (*Huangdi Bashiyi Nanjing*) , and the *Treatise on Cold Damage* (*Shanghanlun*), yet he developed a unique theory. This paper examines his theories, their historical context, their relation to imported agricultural grains, and understanding in the modern milieu.

Keywords: Traditional Chinese Medicine, Song Jin Period History, Medical Anthropology, Food Science, East Asian Medical History

Introduction

The academic schools of the Song Jin Period (宋金朝) represent a flowering of development and re-interpretation of the theories of Traditional Chinese Medicine (TCM). Complex social forces had combined to drive an intellectual revolution in the understanding and application of treatment principles. Zhang Zihe (张子和 1156—1228 CE) was the core scholar within an interpretive approach that came to be known as the *School of Purgation* (*gong xie pai*攻邪派). This method stood in opposition to the rampant use of tonic medicines (*bu yao*补药) instead arguing that purging or draining would better manage disease. Zhang was considered highly influenced by the *Yellow Emperor's Inner Canon* (*Huangdi Neijing* 黄帝内径), *Yellow Emperor's Canon of Eighty-one Difficulties* (*Huangdi Bashiyi Nanjing* 黄帝八十一难经）, and the *Treatise on Cold Damage* (*Shanghanlun* 伤寒论）, yet he developed a unique theory. How should Zhang's theories be viewed and understood in the context of TCM? This paper aims to examine his theories, their historical context, and understanding in the modern milieu.

Historical Context

Traditional Chinese Medicine dates back into Chinese antiquity. It is beyond the scope of this paper to discuss the complex historical development behind the evolution of TCM. However, to understand Zhang Zihe's theories, a brief survey of the historical and social forces shaping the tradition at his time period is essential. Although TCM originated from a shamanic background during the Shang Dynasty (ca. 1600 BCE – ca. 1045 BCE), and progressed through a period of demonology during the Zhou Dynasty (ca. 1045 BCE – 221 BCE), during the Qin Han Period (221 BCE – 220 CE) TCM evolved into a theory of correspondences which typified the metabolism as analogous to natural forces known as the Five Phases (*wu xing* 五行); wood, fire, earth, metal, and water. These forces were seen to exist in a dynamic equilibrium that expressed itself in five core visceral organs (*wu zang* 五脏), six bowels (*liu fu* 六腑), and an interweave from surface to interior known as meridians (*jingluo* 经络). This system was effused with four textures of metabolism (*si wei* 四维);yin, yang, xue, and qi (阴阳血气). These components could be disrupted by internal causes or external influences. The

Jackowicz, S. (2020). Understanding Catabolism: An Examination of Zhang Zihe's Purgation Theory. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 16-19), Washington, DC, USA. ISTES Organization.

structural dynamics of TCM established by the Qin-Han Period have persisted in their majority to the modern day. The model developed further, however the core concepts remain since that early period (Kohn, 2005).

Core Concepts

The concepts of tonification（bu 补） and dispersion（xie泻） are two core aspects of TCM correlating to the underlying dichotomy of deficiency （xu 虚） and excess （shi “实”/ yu “余”/ sheng “盛”）. These concepts can be seen in texts from the Qin Han Period, such as the *Yellow Emperor’s Inner Canon* (*Huangdi Neijing* 黄帝内经) where it is advised to ‘tonify the deficiency, and disperse the excess.’ (補虛寫實，神歸其室，久塞其空，謂之良工。（黄帝内径灵枢胀论五）https://ctext.org/huangdi-neijing). This understanding addresses a simple situation, which has a linear pathological relationship to the degradation of organic function. The pathology can be seen as ‘simple’ therefore it requires a straightforward intervention. This approach seems to have some tradition behind it. In the *Plain Questions* (*Suwen* 素问) section of the same text it states that, “The classics state if full, disperse it, if deficient, tonify it.” (經言盛者寫之，虛者補之。（黄帝内径素问至真要大论十六）https://ctext.org/huangdi-neijing). Herein earlier classics are quoted supporting the idea of the antiquity of this approach.

However, the pathology of the body is not always simple. In the latter Han Dynasty text the *Yellow Emperor’s Canon of Eighty-one Difficulties* (*Huangdi Bashiyi Nanjing* 黄帝八十一难经), complexity in long standing imbalance is described in the treatment principle ‘In cases of deficiency tonify the mother, in cases of excess disperse the child’ (虛者補其母，實者瀉其子。(黄帝八十一难经六十九难) https://ctext.org/nan-jing). This rubric uses the Five Phase system to account for a pentiary interweave of physiology and pathology. Yet within these two systems the presence of deficiency and excess are polarized and separated. The clinician must determine either a deficiency or an excess, but these systems do not account for a mixed presentation. Instead, the *Yellow Emperor’s Canon of Eighty-one Difficulties* advises ‘Thus first tonify, after that disperse’ (當先補之，然後瀉之。(黄帝八十一难经六十九难) https://ctext.org/nan-jing).

Turning to the end of the Han Dynasty’s *Treatise on Cold Damage* (*Shanghanlun* 伤寒论), the complexity of deficiency and excess is still limited. Within the text the co-existence of deficiency and excess are accepted, but they are separated as being in different strata of the body. In the section *Discourse of Balancing the Pulse* (*Pingmai fa* 平脉法) diagnostic signs are parsed and explained. Therein the categories of ‘internal deficiency, external excess’ and ‘internal excess, internal deficiency’ are brought forth (內虛外實也。…內實外虛也。(伤寒论平脉法) https://ctext.org/shang-han-lun). The clinician is admonished to clearly identify them and linearly address each one. Failure to do so can cause iatrogenesis. However, the underlying state is still linearly dichotomous.

Increasing Metabolic Complexity

Why do these early theories fail to describe the complexity of the metabolism? Perhaps it is due to lifestyle and diet. Although the Qin-Han Era enjoyed prosperity, the lifestyle was simple as compared to latter periods. The diet prior to the Song Dynasty predominated in wheat, sorghum, barley, and millet. Although rice was cultivated, the pre-Song rice farming techniques were less developed allowing a lower yield, and the varieties of rice being farmed were less hardy. However, the Song Dynasty led to drastic changes. Zhang lived in a time of explosive economic growth in China. “Between ... 960 and ... 1127, China passed through a phase of economic growth that was unprecedented in earlier Chinese history, perhaps in world history up to this time. It depended on a combination of commercialization, urbanization, and industrialization that has led some authorities to compare this period in Chinese history with the development of early modern Europe six centuries later” (Curtin, p.109).

This development intertwined with an agricultural shift. “In the early part of the Song dynasty ... a new variety of early-ripening rice was introduced into China from Champa, a kingdom then located near the Mekong River Delta in what is now Vietnam, and by 1012 it had been introduced in the lower Yangzi and Huai river regions. ... Because the variety of rice was relatively more drought-resistant, it could be grown in places where older varieties had failed, especially on higher land and on terraces that climb hilly slopes, and it ripened even faster than the other early-ripening varieties already grown in China. This made double-cropping possible in some areas, and in some places, even triple-cropping became possible ... the hardiness and productivity of various varieties of rice were and are in large part responsible for the density of population in South, Southeast, and East Asia” (Embree, p. 839-840).

Examining the diet, there are several factors of relevance to the understanding of Zhang Zihe’s theories. A simpler diet, such as the one in the Qin-Han Period, with less access to meats and fats would revolve around higher intake of grains. Millet, wheat, barley, and sorghum carry fewer impurities and will allow the human metabolism to be like a plant, in that the metabolite absorption is nutrient rich and contaminant poor. In such a dietary situation, nutrient insufficiencies as a cause of disease will predominate. Effectively the human organism will fail to anabolize or fail to catabolize in a linear progression of pathology. Therefore addressing these linear failures will rectify the physiology. Since paucity prevailed through much of the post Han Era the TCM tradition developed a tendency to tonify to rectify the omnipresent deficiencies in the metabolisms of the population. This tendency to tonify as a recourse became a cornerstone of TCM until the time of Zhang Zihe (Jackowicz, 2009).

The aforementioned economic growth in the Song Period changed culture patterns, dietary patterns, and allowed the emerging financial elites to purchase expensive tonic medicines (bu yao补药) which became ever more available following economic demand (Unschuld, 1985). However, the shift in diet to a greater volume of rice may have played a central role in the evolution of Zhang’s theory. Rice uptakes more contaminants that the other grains grown in China traditionally. For example arsenic levels in rice are exponentially higher than other grains. In 2013 the US Food and Drug Administration (FDA) released a study on 656 rice products demonstrating that the volume of inorganic arsenic in them was so high that they advised children not ingest them more than once a week (*Consumer Reports*, 2015). An earlier FDA study showed up to 7.2 micrograms preserving of arsenic in raw grain rice, while the level of arsenic in millet was so low it was not measurable (FDA, 2014). The long term exposure to arsenic is insidious. “Regular exposure to small amounts of arsenic can increase the risk of bladder, lung, and skin cancer, as well as heart disease and type 2 diabetes. Recent studies also suggest that arsenic exposure in utero may have effects on the baby’s immune system” (*Consumer Reports*, 2015). The shift to more rice consumption in the Song Period would have increased the presence of environmental contaminants in the metabolism of the population, such an increase in arsenic levels. In such a state the previous rubric of tonification was no longer as reliable, and in fact, could be deleterious.

The Theory of Purgation

Zhang responded to the prevalence of iatrogenic effect from tonifying. He observed that the presence of invasive factors, or of intrinsic excess accumulations within the metabolism denied the ability of tonic medicines to work correctly. Zhang discussed extensively in his work *Confucian Affairs* (*Rumen Shiqin* 儒们事亲) a concept of “over nourishment” (*fengyang guodu*奉养过度) arguing that the improper intake and overindulgence led to accumulation of fluids and toxins which clogged the normal metabolism (Zhang, 1220). Herein we see a shift from the emphasis on anabolism in tonifying technique, to catabolism in dispersive of purgative technique. Zhang examined the venues from which excess leaves the body; sweat, vomit, stools, urine, blood, or emotions (Kaptchuk, 2000).

But why did he put emphasis on the eradication of accumulation? The answer is three fold. First, Zhang theorized that tonifying in the presence of an excess would irritate the system and create a negative inflammatory response. The inflammatory response could develop to the point of morphological degradation. This understanding can be analogized to increasing anabolic response without maintaining normal levels of catabolism (Zhang, 1220). The increase anabolism could lead to an excited immune response that leads to either a histotoxic response, or potentially autoimmune degradation.

Second, the overabundant use of tonics which bolster anabolism can result in accelerated growth that outstrips catabolic regulation of cellular reproduction. Unrestricted tonification could result in unregulated growth which

can imply cellular reproduction without contact inhibition – the result being cancer. This process could be compounded by increased amounts of cytotoxins.

Third, the economic development and lifestyle of his time had led to greater access to animal products as food. Increased animal products carry greater amounts of unnecessary metabolites that accumulate in the human organism usually in fat stores. These cytotoxins should be removed from the body in the natural catabolic process. However large amounts of the unusable metabolites confound their elimination. The higher level of these deleterious materials will result in a heteropathic behavior of the metabolism.

Conclusion

How can we best understand Zhang's theories in the modern day? Our processed diet with the plethora of preservatives and food additives results in a vast amount of useless metabolites in our food. Therefore, our bodies accumulate large amounts of useless chemical substances that need to be eliminated. Unfortunately, we deny the normal purgative venues. We use anti-perspirant in order not to sweat. We take medicines to calm nausea, or to stop diarrhea. We use artificial hormones to regulate the menstrual bleeding. We also use psychiatric medications to limit our emotional responses. Further, we have tonic stimulants readily available in our society to maintain our lifestyle which revolves around an ever increasing workday and a shrinking sleep period. Zhang's purgation theory can explain why we have an increase in cancer, autoimmune disease, and idiopathic inflammatory states. If we could appropriately apply Zhang's Purgation Theory then perhaps some of our modern disease states would yield to this sophisticated treatment method.

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The Study of the Relationships among Participation in Recreation Activities, Life Satisfaction and Happiness in University Students

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Abstract: The aim of the present study is to examine the relationships among university students' participation in recreation activities, life satisfaction and happiness. The study was conducted with 460 university students based on the causal comparison pattern. The Survey of Participation in Recreation Activity, Life Satisfaction and Happiness scales were used to collect the data of the study. According to the research findings, no significant difference was found in terms of university students' life satisfaction and happiness levels depending on their participation in sports activities. On the other hand, it was observed that the happiness levels of the students who participated in social activities and those who participated in artistic and cultural activities were significantly high. Finally, significant differences were found in terms of the number of students participating in recreation activities regarding their happiness levels.

Keywords: University students, recreational activities, life satisfaction, happiness

Introduction

Recreational activities are a universal need that takes an important place in people's lives and, are activities that add meaning to life by raising the standard of living. People participate in recreational activities due to their physical, psychological and social benefits (Sevil et al., 2012). The need for recreation, consists of the benefits of recreational activities to individual and social development (Kleiber, 1999). Temel and Tükel (2020) emphasized that active sports and participating in activities with recreation content, increase individuals' self-esteem and, affect them positively.

Recreation activities are activities that can be performed individually or in groups, as active or passive, by women - men, as young - old, at any time, in open or covered areas. For this reason, recreational activities are activities that enable individuals to have fun, relax and develop them which do not have limited coverage and, which can address to people in any place and at any time. In this case, by participating in the activities, people express themselves and can reveal their unknown aspects. In this context, individuals have the opportunity to protect their physical and mental health by increasing their life satisfaction and happiness.

Joudrey and Wallace (2009) conducted a study that demonstrated statistically the importance of leisure activity. In passive leisure, individuals show psychological symptoms but, on the other hand, quite high levels were observed in the mental health status of the individuals participating in active leisure. It is natural for individuals have high life satisfaction who can provide close relationships with people in the society, socialized and integrated into social life and who are at peace with their environment.

In addition, it is expected that the life satisfaction and happiness level will be high of each other engaged in sports and physical activities, interested in art and culture. In this context, individuals increase their leisure with different activities and increase their life satisfaction and happiness by this way. In the States, it has been found that attending club meetings in regular manner, taking part in voluntary work, attending monthly entertainments, have an equal effect on satisfaction of life and on their happiness like doubling their income (Lapa, 2011; Tekgöz 2001).

There are many studies in the international literature on the effects of participation in leisure activities on individuals' life satisfaction and happiness (Coleman, 1993; Kern et al., 2014; Kuykendall, Boemerman & Zhu, 2018). However, few studies have been made systematically in the university students sample in Turkey. In this study, in terms of life satisfaction and happiness levels of university students, their participation in active sports, artistic, cultural and social activities was examined.

Tukel, Y. (2020). The Study of the Relationships among Participation in Recreation Activities, Life Satisfaction and Happiness in University Students. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 20-24), Washington, DC, USA. ISTES Organization.

Method

This study is organized regulated to the causal comparison pattern. Based on the causal comparison pattern, the relationships between university students' participation in leisure activities, life satisfaction and happiness were examined in this study.

Population and Sample

The study group of this research consists of university students studying at different faculties of Necmettin Erbakan University and Selçuk Universities. The scales of the study were reached to 460 students by choosing an easily accessible sampling method. 53.27 % (n = 245) of the students are female and 46.73 % (n = 215) are male students.

Data Collection Tools

Within the scope of the research, personal information form, Leisure participation survey, life satisfaction and Happiness Questionnaire were applied to university students.

Life Satisfaction Scale

The Life Satisfaction Scale developed by Diener et al. (1985) and adapted to Turkish by Köker (1991) was used to determine the life satisfaction of university students. The Cronbach Alpha value used to calculate the reliability of the scale is 0.87. Life Satisfaction Scale is a one-dimensional scale consisting of 5 items. Getting high scores on the Life Satisfaction Scale means that the individual's satisfaction with life is high.

Oxford Happiness Questionnaire-Short Form (OHQ-S)

Oxford Happiness Questionnaire with 29 items developed by Hills and Argyle (2002), is a Likert type measurement tool consisting of 8 items adapted to Turkish by Doğan and Çötok (2011). The Cronbach Alpha internal consistency coefficient of the Oxford Happiness questionnaire on this research data was calculated as 0.82.

Data Analysis

Within the scope of the research, data were analyzed by using independent sample t test and one-way analysis of variance.

Findings

When Table 1 is examined, it was observed that there was no significant difference in life satisfaction and happiness score averages due to active sports (p> 0.05).

Table 1.Comparison of Life Satisfaction and Happiness Scores of University Students according to the Status doing Active Sports

	Active Sports Status	n	Mean	Std. Deviation	t	p
Life Satisfaction	Doing active sports	309	3,54	1,08	-,129	,898
	Not doing active sports	351	3,55	1,13		
Happiness Level	Doing active sports	309	3,05	0,54	1,245	,214
	Not doing active sports	351	2,99	0,53		

When Table 2 is examined, it was observed that there was no significant difference in happiness score averages depending on active artistic and cultural activities (p> 0.05). However, a significant difference was found in life satisfaction score averages based on active artistic and cultural activity (p <0.05). Life satisfaction of university students doing active artistic and cultural activities, is significantly higher.

Table 2. Comparison of life satisfaction and happiness scores of university students according to their participation in cultural and artistic activities

	Active Cultural and Artistic Activity Status	n	Mean	Std. Deviation	t	p
Life Satisfaction	Yes	215	3.67	1.18	2.012	.045
	No	445	3.48	1.06		
Happiness Level	Yes	215	3.07	0.57	1.649	.100
	No	445	3.00	0.52		

When Table 3 is examined, it was observed that there was no significant difference in life satisfaction score averages based on active social activity (p> 0.05). However, there was a significant difference in happiness score averages depending on social activity (p <0.05). Life happiness of university students performing active social activities, is significantly higher.

Table 3. Comparison of life satisfaction and happiness scores of university students according to their participation in social activities

	Active Social Activity Status	n	Mean	Std. Deviation	t	p
Life Satisfaction	Yes	368	3.60	1.14	1.649	.100
	No	292	3.46	1.06		
Happiness Level	Yes	368	3.09	0.54		
	No	292	2.93	0.52	3.670	.000

When Table 4 is examined, it was observed that there was a significant difference in the mean score of university students depending on the frequency of participation in recreation activities at their leisure time (p <0.05). Participants performing 4-5 hours or more leisure activities per week, were found to have higher average happiness scores compared to participants who performed these activities less frequently.

Table 4. Comparison of happiness scores of university students according to the frequency of their participation in recreation activities in leisure times

Average frequency of weekly participation in recreation activities in leisure time in a month	n	Mean	f	p
1 hour	148	2.943		
2 hours	177	2.949		
3 hours	180	2.994	6.340	.000
4 hours	95	3.220		
5 hours +	60	3.171		

When Table 5 is examined, it was observed that there was no significant difference in life satisfaction score averages depending on the frequency of participation of University Students in recreational activities in leisure time (p> 0.05).

Table 5. Comparing life satisfaction scores of university students according to the frequency of their participation in recreation activities in leisure time

Average frequency of weekly participation in recreation activities in leisure time in a month	n	Mean	f	p
1 hour	148	3.43		
2 hours	177	3.48	1.185	.316
3 hours	95	3.57		
4 hours	180	3.64		
5 hours +	60	3.69		

Results and Discussion

In this study, life satisfaction and happiness levels of university students were analyzed comparatively according to the status of active sports, arts, cultural and social activities. In the study, it was observed that there was no significant difference in terms of happiness variable depending on active sports and social activity. However, it has been observed that the participants who carry out active artistic and cultural activities have a high level of happiness. These findings contradict the research report of the World Health Organization (WHO, 2019), De Rezende et al. (2014). According to the findings of these studies, while there is a significant relationship between social, physical activity and active sports habits and individuals' levels of happiness, however, there is a decrease in negative psychological symptoms.

Another finding reached in this study is that, it has been observed that active sports and social activities do not cause a significant difference in terms of life satisfaction. These findings contradict research findings by Grant N, Wardle J, Steptoe A (2009), Maher et al. (2013). It has been shown in the literature that regular social, sports and physical activity can be associated with increased life satisfaction among all age groups. In addition, Soyer et al. (2017) stated in their study for university students that, not participating in sports activities will have a negative impact on life satisfaction. In general, the concept of life satisfaction is related to all aspects of an individual's life. In this context, the relationship between active sports and life satisfaction can be examined in depth with qualitative research methods.

Another finding of the research is about the frequency of leisure activities of university students, their relationship with life satisfaction and happiness levels. In the study, it was observed that as the frequency of leisure activities of the students increased, their level of happiness increased accordingly. However, there was no significant relationship between leisure frequency and life satisfaction. These findings are similar to the research findings of Janke et al. (2011), Lloyd and Auld (2002) and Yavuz and Sünbül (2004). Bailey and Fernando (2012) have demonstrated that, the participation and frequency of leisure activities affect the happiness of individuals positively. According to Broughton and Beggs (2007), intense leisure activities positively affect the individual's psychological satisfaction and happiness level. When the results of the studies are examined, it is seen that leisure activities have an important contribution in increasing the positive psychological status of individuals. However, in some studies, it was found that there was no significant relationship between life satisfaction and leisure participation, in particular (Gökçe 2008). Tukel (2020) stated that, university students provide high satisfaction with their leisure activities regardless of their gender. Based on the results of this research, it is recommended to examine the variables of participation in lesiure activities, life satisfaction and happiness in different age and sample groups.

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The Role of the Supervisor on Developing PhD Students' Skills

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Abstract: Essentially, supervision is the act of looking over the work of another person who absences full knowledge of what they are doing, or the concept at hand. The problem of developing PhD students research skills in institutes has become one of the most critical issues related to research institutes, where interest in the scientist's personality increases, it is noted that it is the individual possessing the basics and skills of a research nature that is capable of self-realization, the creation of new technologies, the transformation of social reality. Supervisory modality, function, and approaches are interrelated to the responsibilities of a supervisor. It can be divided into four sets: those related to the progress of the candidate, mentoring, coaching in the study subject, study methodology, and how to write the thesis and sponsorship of the student's involvement in academic or regular exercise. Respectable supervisory applies aid students to achieve their potential and add to the University's research outline. A good supervisor cannot be a scientific adviser on topics on which he does not have in-depth specialized knowledge. It is possible to find an explanation for the fact that the supervisor leads PhD students in various scientific specialties. The aim of this study is to investigate the supervisor's part in doctoral students working practice.

Keywords: Supervisor, student's skills, research activities, doctoral education, supervision quality

Introduction

The problem of developing students' skills in educational institutes has become one of the most urgent missions of research institutes around the world, where Supervision is the act of overseeing the work done by subordinates whose level of knowledge and technical abilities are considered immeasurable to that of his superior (Orellana et al., 2016). It is the act of looking over the work of another person who absences full knowledge of what they are doing, or the concept at hand. PhD supervision is not only intellectually demanding, but also important and complex relationship (Prazeres, 2017). The supervision of PhD student often comes as a challenge to both individuals, PhD student and the supervisor. PhD supervisors are expected to fulfill many functions, teacher, mentor and a patron. All these functions require different skills at different levels of a PhD. In fact, it is an emotional process, with many expectations from both sides. Often students are faced with conflicts and are forced to learn how to handle emotional moods of supervisor (Johansson et al., 2014). In an ideal world, supervision should be balanced between the guidance and independence of each student. However, often the supervision comes far from this optimum and becomes overwhelming for a student.

The problem of developing PhD students research skills in institutes has become one of the most critical issues related to research institutes, where interest in the scientist's personality increases, it is noted that it is the individual possessing the basics and skills of a research nature that is capable of self-realization, the creation of new technologies, the transformation of social reality. Supervisory styles, roles, and approaches relate to the responsibilities of a supervisor. It can be divided into four sets: those related to the progress of the candidate, mentoring, coaching on the research topic, research methodology, and how to write the dissertation and sponsorship of the student's participation in academic or professional practice (Orellana et al., 2016). Respectable supervisory applies aid students to achieve their potential and add to the University's research outline (see Figure 1). At many universities, the reports of a supervisory relationship are missing almost entirely to the pleasure of individual research students and supervisors. Although this approach typically works fit, it irregularly proves inadequate. The highest academic title of professor is the academic title in any research institute, where

Almusaed, A., Almusaed, A. (2020). The Role of the Supervisor on Developing PhD Students' Skills. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 25-36), Washington, DC, USA. ISTES Organization.

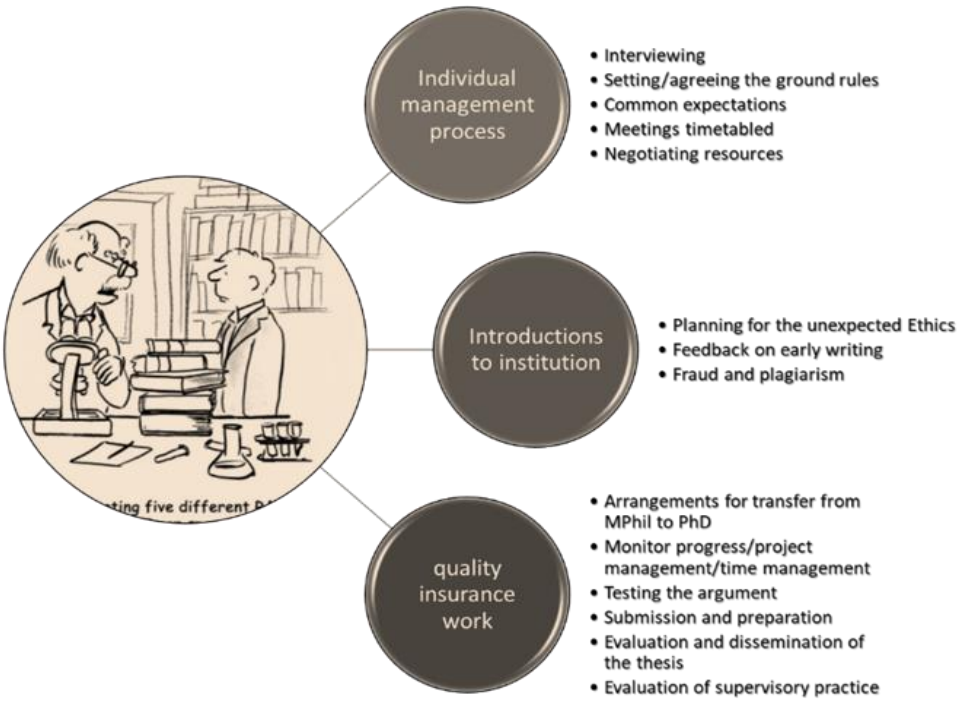

Figure 1. Shows the Supervisory Functions with Students

Pearson & Kayrooz (2004) believed that student supervision is a facilitative process needing encouragement and test. It means providing educational charges and occupations, which include: going forward with respect to the candidature, mentoring, coaching the research project and sponsoring student involvement in academic performance. The doctoral supervisor can be a mentor in two directions in this situation, being responsible both for doctoral students and for overseeing probationary staff acting as a co-supervisor (Code of Practice for Research Degrees 2000) (Lee, 2007). The academic title of a professor in a specialty may be awarded to doctors of science who have trained a lot of students as scientific leaders or scientific consultants, who have been awarded scientific degrees. In terms of scientific institutions, this is not so easy to achieve because many of them do not have state quotas for full-time postgraduate training, and for those who do prepare highly qualified specialists, the allowance for graduate students is small. Nevertheless, these incentives for working with graduate students and doctoral students are not in the first place. The title of professor in the scientific institute can be awarded to doctors of science, if, fulfilling the requirements, they prepared, as supervisors or scientific consultants, as a rule, at least two students who were awarded academic degrees. A good supervisor has to be,

- A talented scientist who creates ideas
- Able to achieve intense, inspiring and highly productive work of students
- He needs intuition to help determine what is essential and what is not in the team's practice

As the work plan for the thesis is completed, it controls the timeframe, the results of scientific research, identifies existing errors and shortcomings, helps to summarize practical results and theoretical conclusions, helps in designing the style and composition of the dissertation, gives recommendations on how to correct deficiencies and prepare materials for defense. The Doctor of Philosophy PhD education is a research training which aims to prepare the doctoral student to become an independent researcher who can make significant contributions to academia and/or industry. A large part of the training is focused on the development and improvement of project leadership skills including planning and problem-solving. Together with the supervising team and a representative of the department, the doctoral candidate is responsible for the agreement on an Individual Study Plan (ISP). The ISP is updated once a year, or more if required, and contains a realistic overview of agreements on the project's scope, responsibilities including supervision, courses, publications, and departmental work as well as measures to improve the doctoral student's education (i.e., feedback). The ISP needs to promote the fulfillment of the learning outcomes of the PhD-education as well as to clarify the rights and obligations of the doctoral student, supervisors and department. The doctoral student, together with the supervising team, has the responsibility to finish the project within the given time. Every PhD supervisor is distinctive and every PhD candidate as well. Consequently, correlations between a supervisor and a PhD candidate are crowded with idiosyncrasies and peculiarities (Ahmed et al., 2010).

The Problem Description

Having an excellent supervisor(s) with extraordinary knowledge in the field of research is one of the most critical factors. Many PhD students feel difficult with this new study type and manner, for them it represents a big subject area is not a meal reservation at a restaurant, or making a phone call and cancels it. The study in PhD is based on a contract whose violation morally disqualifies the person who commits it. With a PhD, the study involves originality, honor. Many students think that the supervisor takes a great effort in creating good research and a competent researcher, he takes the most deal of responsibility to conduct the supervision, where his job is not just a position that solely assigns tasks. The supervisor's responsibility is to enforce safe study process practices and procedures; he must take immediate steps to correct a failure situation. Everything must be clear and systematic. If a hazard is identified, the supervisor must act.

The Study Aims

The study aims to create a good understanding of supervisor role in the development of PhD students skills, where the supervisor's activity is significant in his ability to reveal the research potential of PhD students so that their action would not only be of a formal (i.e., purely didactic, opportunistic) nature but would have an outlet to the creative level. Every supervisor is interested in creating his research place area by preparing the right PhD holders.

PhD Student and Supervisor in an Inter-Reciprocity Action

Today the research activities are paying much attention, which gathers dozens of like-minded people. A PhD student can have all this only if he knows why he is studying the research problem; the PhD student has to be sure of himself; he must be open to challenges and be prepared to deal with them as the project demands, where the process of the doctoral education process follows a standard way (see Figure 2).

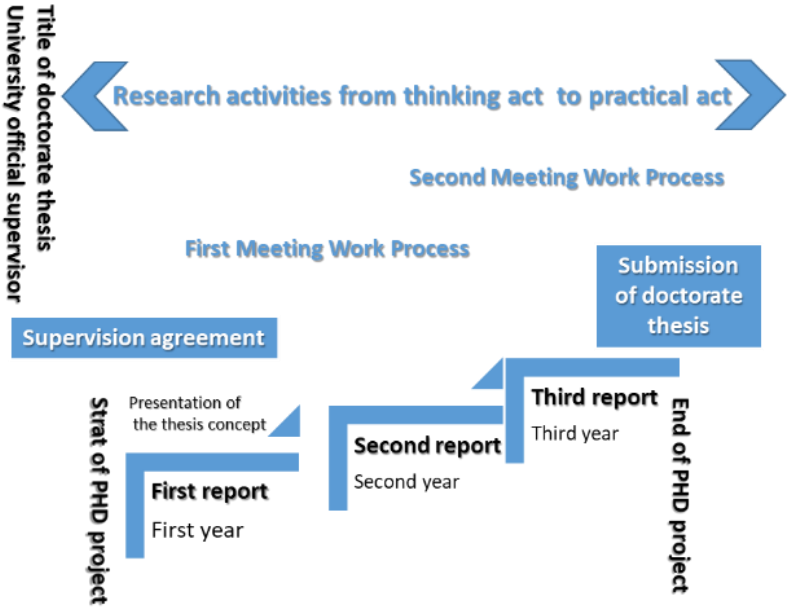

Figure 2. The PhD Research Project Activates and Development Process

The most serious attention should be paid to the choice of the research topic. It is vital to take into account the requirement of the PhD researcher as it is almost impossible to undertake the work that is imposed. In supervising process, the interaction between all doctoral educational factors must be involved in balancing form (see Figure3) where the process of assignment supervisors of PhD students, supervisors and students require to feel that they have selections or at least the aptitude to say 'no' to suggest arrangements. It is required to make this recommendation because students who felt they had choices made the best progression and were gratified. Scientific supervisors usually do not spare their free time to help their ward. There is also a kind of statistic that tells how many precincts completed their work under his auspices. The supervisor is working on his dissertation

on his topic, formulates a plan with which the student will prepare to defend his work. Together with his ward, the supervisor develops a study schedule. In general, it plays a huge role in the work of the dissertation. The supervisor is obliged to write his authoritative review of students' work, where he must provide information on the admission or non-admission to protection. Inadequate supervision can lead to a significant impact on the students involved, affecting both the quality of their research and their motivation. (Norhasni, Aminuddin & Abdul, 2009). A few students had two active supervisors, either as part of their formal supervisory arrangement or informally. These students made good progress with their theses and were invariably satisfied with their supervision (Ives & Rowley, 2005).

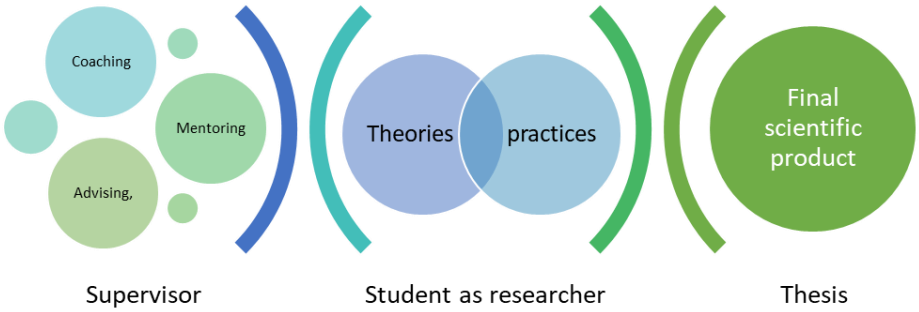

Figure 3. Supervision Process and Interaction Factors of a Doctoral Education

A research plan, including student participation, should be recognized upon enrollment. PhD Students shall be conscious of both the arrangement and broad timelines that their PhD project requires. (Ives & Rowley, 2005). For a PhD student, the value of a supervisor is the ability to receive advice and recommendations and continuously. A PhD student should, using the opportunity available to him, "exploit" the methodical erudition, knowledge, and experience of his supervisor, and not hope that he will pull him out to defend his dissertation. The relationship between PhD students and their supervisors should be confidential. However, often they end up independent of each other. The reason is complicated structures. The PhD student's supervisor plays a serious role in doctoral education, and 'good' doctoral supervision is vital to fruitful research and education plans (Prazeres, 2017). The study underlines the links between the quality of doctoral supervision and student progression as well as attrition rates and completion rates have reputational and financial implications for universities in an increasingly competitive higher-education marketplace (Ives & Rowley, 2005). In most universities, the reports of a supervisory relationship are missing almost entirely to the pleasure of individual research students and supervisors, where the institution and student environments play an important role in creating a successes research project (see Figure 4).

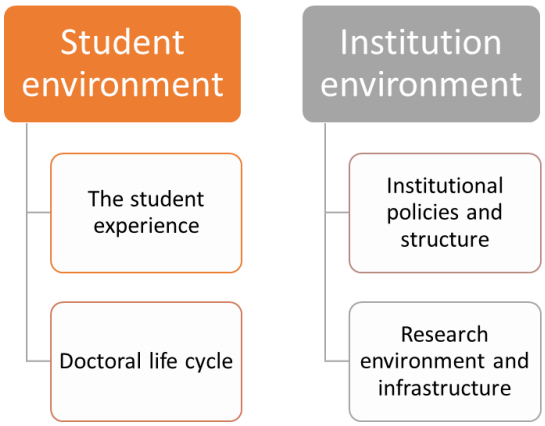

Figure 4. The Environments of Doctoral Education Components (Bates et al., 2011)

As well as the factors that mark the achievement of the program, these weaknesses have to be taken in high attention in supervised practice. In a study made by Geoff M. Gurr;"Negotiating the "Rackety Bridge — a Dynamic Model for Aligning Supervisory Style with Research Student Development" shows that supervising in form and process can be "active" or "passive, " and it can be "direct" or "indirect" state (Gurr, 2001). It affects straight-on student output and behaviors (see Figure 5).

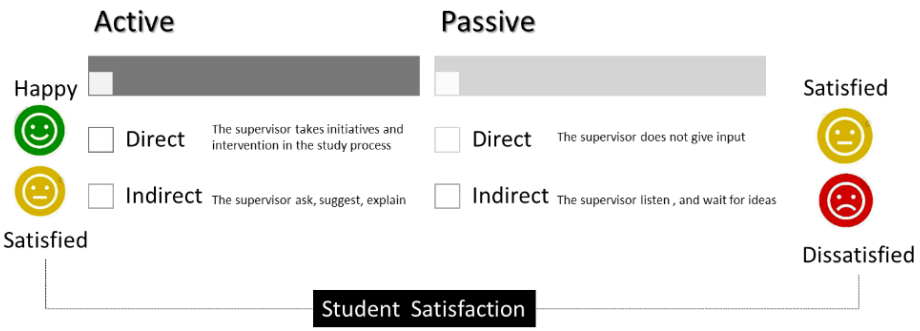

Figure 5. Arrangement of Supervisory Style and Student Independence Adapted from Gurr (2001)

A PhD student must have skills to comprehend how to prepare a work plan for research, including the stages of analysis, assessment of time costs and the choice of sources of information. Some academic supervisors may avoid the difficulty of dealing with the ambiguous demands placed upon them by focusing on one role only. This tactic can reduce their effectiveness if the individual is not adept at switching from one compartment to another as situations demand because unique approaches can manifest themselves swiftly (Zehir, Sehitoglu, & Erdogan, 2012). Based on a review of the literature of graduate student supervision indicates, that no perfect formula for the supervisor-student relationship; multiple factors involved, such as the personality of the persons involved, methods in knowledge acquirements.

The Negative Aspects in Supervision Process

Supervision has to take his role in supervision process where he needs to create a constructive relationship with PhD students. In many situations, this relation can create a negative form, where the supervisor doesn't take his objective role; in this situation the supervision can take three forms as follows:

Abusive Supervision

The supervisor who expresses abusive style is notoriously rude to the student, crushing her/his ideas, blaming students for their own failure and mistakes. It is behavior which is expressed by continuous hostile behavior of supervisor versus PhD student. Abusive supervision results in dysfunctional consequences, including low job satisfaction, conflicts with friends and family or severe psychological stress including depression (Tepper, 2000). Or it can even lead to unethical acts highlighting the relation between elevated anxiety and unethical behavior (Kouchaki, 2015).

Ghost Supervisor

It is an opposite of the previous type. It also appears as more common one and can also occur when a PhD supervisor has many tasks to fulfill or too many students to supervise (Almusaed, 2018; Bazrafkan et al., 2016). The "ghost supervisor" is an invisible one, very rarely responding to emails, somebody who can be seen just seldom. For students who need more engagement and support, this type of supervision can turn into a nightmare, where student should grow into independent researcher and should be able to find solutions of problems alone. However, there should always be a balance between constantly seeking advice of supervisor for every small problem and being left alone without any support at all (Johnson & Frank, 1997). Although for some PhD students who work independently, this type of supervision may actually appear as a satisfactory model. However, lack of sufficient supervision is usually one of the main obstacles and reasons for delayed PhD.

Controlling Supervision

In quite a contrary to the "ghost supervisor" is over controlling supervisor, called also a micro manager who awaits update on any, even the smallest problem. Micromanaging is more likely to occur in science (Sapienza &

Lombardino, 2006). Here, the controlling supervisor does not allow the PhD student to make any research choice on their own (Gunnarsson, Jonasson, Billhult, 2013)" they infantilize me and I can do nothing without their prior consent". No matter if it comes to the selection of the topic of next paper or methodology for experiments. PhD student has also no choices if it comes to the management of her/his project. Micromanagement is one of the worst deficiencies which supervisor can have, because it doesn't leave any room for development and creative thinking of the PhD student. It facilitates guided dependence instead of scientific creativity (Lee, 2010) (see Figure 6), whereas to become a successful researcher the skill of critical-solving problem is necessary. Moreover, the micromanaging supervisor often enforces own ideas over ideas of a student. It often happens during the process of writing the manuscript. The controlling supervisor not only gives advice on the improvement of the draft, but also makes substantial changes to the manuscript. The supervisor rewrites the whole paper until the work is presented with his own words, imposing own ideas.

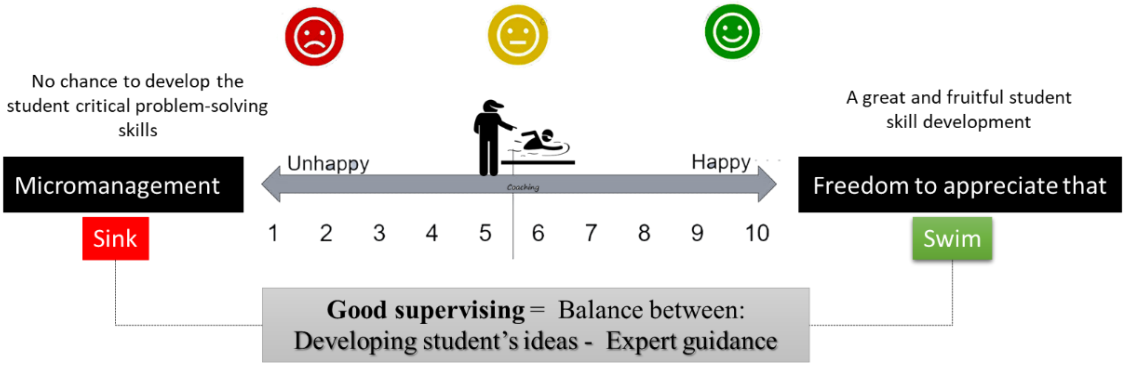

Figure 6. Direction-self-direction Scale of Scientific Creativity (Lee, 2010)

Such supervision is highly discouraged for students and can even turn down their love and passion for science. The role of a supervisor is to give the student freedom to explore, but at the same time gently guide away in case of substantial off track (Lee, Dennis, & Campbell, 2007), not to treat students as a labor for their own agendas. In an investigation made by Evans, T. M., L. Et al. " " Evidence of a mental health crisis in graduate education" " (Evans et al., 2018) shows that graduate students are more than six-time as likely to experience depression and anxiety as compared to the general populations (see Figure 7).

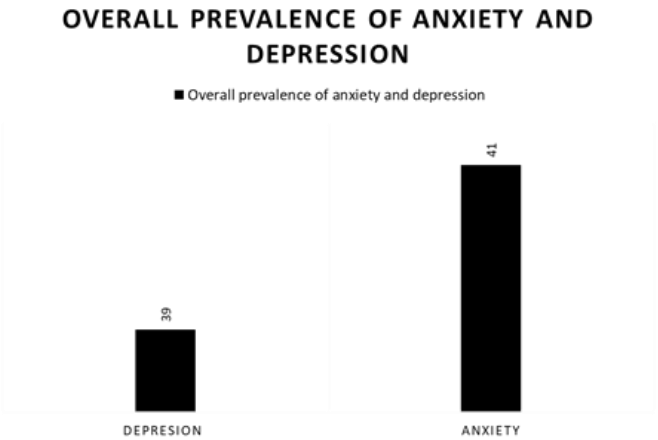

Figure 7. The Overall Prevalence of Anxiety and Depression Adapted from Evans et al. (2018)

The Research Project and Supervision, Evaluation

PhD supervision is not only intellectually demanding, but also important and complex relationship (Norhasni, Aminuddin & Abdul, 2009). The supervision of PhD student often comes as a challenge to both individuals, PhD student and the supervisor. PhD supervisors are expected to fulfil many functions, teacher, mentor and a patron. All these functions require different skills at different levels of a PhD. In fact, it is an emotional process,

with many expectations from both sides. Often students are faced with conflicts and are forced to learn how to handle emotional moods of supervisor (Amy et al., 2013).

There have been various attempts to define and measure research supervision, quality, the list below is indicative but by no means exhaustive. For the present purpose, it is useful to work with the traditional model focusing on the supervisor-student dyad as where the supervision happens. This interpersonal relationship between supervisor and PhD-student is crucial for a positive experience of research supervision. For example, Lee (2008) proposes a five concepts framework of research supervision, which should address functional aspects of project management (essentially leadership skills), enculturation of the student to the discipline, two aspects of student autonomy (critical thinking and emancipation) and relationship development between supervisor and student. Halse & Malfroy identify five facets that can be subdivided into two emergent properties characteristic of successful doctoral supervision (formation of a supervisor-student learning alliance devoted to the accomplishment of the PhD project, and enculturation of discipline-specific habits of mind) and the transmission of three types of expertise (scholarly, technical, and contextual) from supervisor to student (Christine & Janne, 2010). There is some correspondence between the two frameworks (e.g., acculturation occurs in both of them), but they also remain notable differences: Halse & Malfroy's emphasis on expertise remains strangely absent in Lee's treatise, while Lee's aspect of autonomy does not get explicit attention in Halse & Malfroy's taxonomy.

What do students expect of their Supervisor?

Students expect their supervisors to have the knowledge and talent to supervise in a specific part of investigation but also poverty them to be rational, serious, helpful of their effort in good and bad times, where they should performance as mentors and that a mentoring relationship requires reciprocal respect based on high academic values, similar interests and regular interaction. With respect to the characteristics of a perfect supervisory connection, whether they were recognized impulsively by the interviewee or at the interviewer's appeal, it can be inferred that as recommended by Gurr (2001), a supervisor might adopt diverse styles in concordances with the stage of the research or according to the student's requirements. Especially among students, "accessibility, friendliness, empathy" as well as "direction" or "expertise in the field" was considered a desirable feature of supervisors. A Good PhD-supervision is considered essential in both trainings of excellent PhD-students as well as promoting high-quality research However, there is a global trend that researchers are expected to dedicate more time for both teaching and research (Christine & Janne, 2010). That it is more pressure to produce high-quality research (Deuchar, 2008).

The Primary Role of the Supervisor

The role of the supervisor in the preparation of doctoral dissertations is well known. However, its implementation is a rather complicated process. It required establishing specific rules for scientific and organizational activity. The supervisor has to take the primary responsibility for:

- Considerable respect to the PhD student views from the moment of acquaintance to the defense of the thesis.
- Providing all kinds of assistance in the deep understanding of the topic of dissertation research.
- Labor on a jointly defined plan, which should be as detailed as possible and specified in time, and which contributes to the discipline, self-organization, as well as supervisor and his ward.
- Current (out of regulation) working relationship, where the initiative is more for a graduate student, doctoral student.
- Practical assistance in the formulation of provisions and conclusions in the scientific presentation of the fact (document) and its understanding.
- Developing a PhD student in the ability to design the regulated apparatus, respectful attitude properly
- Establishing an equal partnership with his student
- Advising a graduate student in choosing the most appropriate topic
- Does not consider himself a co-author of the thesis, limiting him to encourage and recommendations?
- Continuity of supervision is essential about thesis completion times and satisfaction with supervision and can be interrupted by the student and supervisory issues. Student issues include ill health and personal problems.

The principal phase of supervision is concerned with the procedure of assuring that the student makes worthy participation toward completion. The supervisor may understand themselves as being like a family doctor, he can, for example, offer his student with precise knowledge; he can be a gatekeeper to much more knowledge resources, professional views, and networks. The supervisor can select which gates to open, principally in the primary periods of the researcher's life. Within this understanding, therefore, there is also an understanding of the influence of the supervisor in its widest sense. Not only is the researcher 'present' in this model, but the supervisor is also 'present' as well (Vilkinas, 2007). The supervisors can be classified in many categories according to the interacting with the students. According to a study made by Ahmed A. Et al, "Effective PhD Supervision"; (Ahmed et al., 2010) they classified six categories. They can be as a; Delegator, friend, expert guiding, coach a quality control, and editor; (see Figure 8):

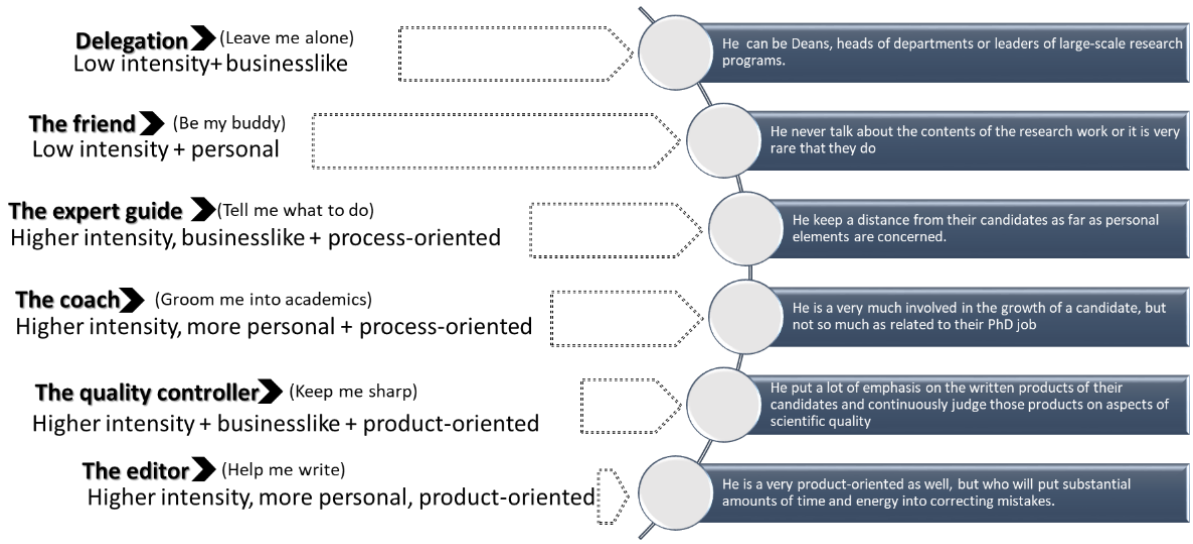

Figure 8. Shows the Supervisors Types, adapted from Ahmed et al. (2010)

Many researches show that the relationship between supervisor and student has either positive or negative effect on the whole process of acquiring PhD title. In fact, failure or success of the project is largely determined by good supervision (Van de Schoot et al., 2013). A vital aspect of the active supervision of PhD research is a supervisor- PhD student interaction, where it can affect directly to the characteristics and requirements of students and official circumstances as well as the abilities, approaches, and roles of supervisors and their supervisory styles (Orellana et al., 2016). Supervising is a performance of guiding, observing or administration a mission to make sure, that the process is completed adequately. Supervision as a process is defined in many diverse manners; however, a supervisor at all times has an impact. Supervising does not need the skill to impact, only the capability to delegate. The supervisor helps his student, among other things, in drawing up a work plan and a timetable for working on her dissertation. It helps a novice researcher to master the methodology of researching topics, problems, phenomena. The supervisor has to move out research and increase activities and be an experienced individual who is well knowledgeable in his area of expertise for which the thesis is being written (Connell, 1985).

The supervisor must have in-depth scientific expertise in his specialty; have extensive experience in systematic work, its organization. Of course, a supervisor cannot know the methodical problem investigated by a PhD student in subtleties, but he must understand and imagine the ways of scientific research. A supervisor should be an example for his PhD students not only in their area of research, but also in the private and public life of his student. A student needs a dissertation, and a supervisor should help in every way, be an adviser when they need it. Therefore, the objective order was as follows. A student gives a sketch of thoughts, a part of a paragraph, a thesis. At the initial stage, after clarifying the topic, together with the graduate student draws up a work plan, develops recommendations on the use of literature. The PhD students need to get help directly from their supervisor, sometimes urgently in some weaknesses of the doctoral process (Orellana et al., 2016). The following can be identified as the main weaknesses of doctoral programs based on traditional models.

- Many students do not complete their required program.
- Supervisors sometimes do not know if additional training and support are required to ensure completion of the program
- Syllables tend to present a program emphasizing skills with little of use to their students

- The teaching progression involved in the acquisition of knowledge and research competencies tends to be weak.

One of the main requirements for a supervisor appointed to supervise a PhD student in the preparation of his thesis is the presence of his Doctor of Philosophy degree in the relevant field. The style and methods of work of a supervisor and his student can be very different. A scientist cannot be a supervisor on topics on which he does not have in-depth specialist knowledge. It is possible to catch a clarification for the fact that individual scientists lead PhD students in various analytical specialties (Lee, 2017).

Supervisor and Development of Student's Skills Way

The problem of developing research skills in academic areas has become one of the most urgent in the actual form of universities (Moss, 2018). Development of research skills, in general, is related to the development of a practical reading of research topics, where the supervisors also developed their own rules for the management and conduct of educational research. Works that help to see, discover and develop in the student the ability to do this kind of activity (McKay et al., 2008). Supervisors and students need to feel that they have choices or at least the ability to say 'no' to suggest arrangements. The primary function of supervisions of all types is the leadership, plus the encouragement and recognition of leadership in other people. Good supervisors look to have many of the same abilities of good lecturers and good therapists. They are empathic, genuine, open, and flexible, where good supervisors have a sense of humor which helps both the supervisor and supervise get through rough spots in their work together, and achieve a healthy perspective on their work (Löfström & Pyhältö, 2014). The Student's skill occupations in research institutions can take action from passive state "thinking" to active state "putting into practice," as it is presented in Figure 9.

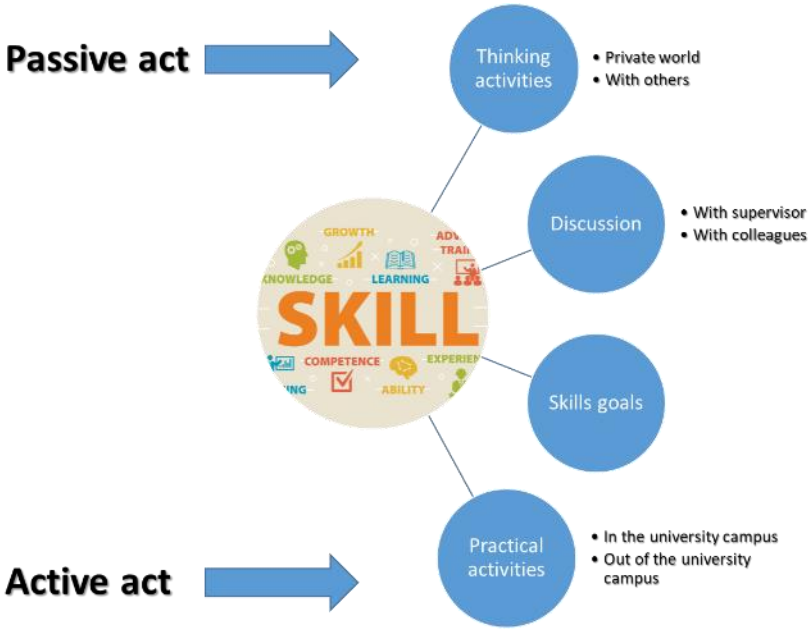

Figure 9. Student's Skills Activities in Research Institutions

One of the most interesting aspects of the supervisory relationship is the autonomy and independence of the student in the process. Another is the assessment made of this aspect by both supervisors and students, based on their experience of the supervisory relationship, where the supervisor has to Involve efficiently the students in scientific research zone by:

1. The supervisor needs to know some basic facts about the student's personal life. Not in order to start amateur therapy sessions, but to know what to do if there is a crisis, or a need to apply for a suspension of candidature, a scholarship renewal or an extension of time.
2. The supervisor has to help the students to develop their communication skills, which include an ability to both listen and make comments in an open, objective and constructive way
3. The supervisor has to help his student overcome their fear of a new type of activity. The fact is that in order to conduct a study, motivation and focus on obtaining a specific result are needed. All this can be

with the student only if he knows why he is studying this problem, confident in himself, not afraid of difficulties.

4. Positive interpersonal working relationships have been associated with student satisfaction with their supervisor and also effective progression through the PhD (Ives, G. & Rowley, 2005).
5. Create the student interested in scientific and research activities, the most serious attention should be paid to the choice of the research topic. It is very important to take into account the interests of the young researcher. It is impossible to effectively perform work that is imposed, boring and uninteresting
6. Create ability to choose the topic which must be correctly formulated. As practice shows, the topic is better to choose a specific, preferably narrow, poorly understood. In this case, it is imperative to provide for a "field for independent activity". Research is considered work, which contains not only a review of the literature on this issue, but also obtained its own facts, information, and evidence.
7. There should be two active supervisors as part of the formal supervisory arrangements. It is imperative that all three meet together at least every 3 months and that both supervisors receive written work. The advantages of this procedure are that the student can be provided with a match in all three areas and a second person to turn to when one supervisor is unavailable. It is also advisable that the student and the main supervisor can establish a constructive interpersonal working relationship requirement
8. A real supervisor is able not only to give valuable guidance, but also to accomplish a lot himself, for example, to quickly type in or edit an article on a computer. And of course, the doctor of science is more suitable for the role of a supervisor than the candidate of science
9. The supervisor may be able to short-circuit problems that would take the student a lot of time and trouble: finding research money, gelling access to equipment and transport, getting a subsidy to go to a conference, finding space to work in and furniture to put it in, and so forth.
10. The supervisor has to help his student in positive feeling, where the student should feel the leader's deep interest in the results of his work. Years of experience allow us to argue that a teacher formally related to the management of scientific work, passively expecting a student to independently deeply research the topic and make a conclusion, does not get the desired result
11. The supervisor has to be at different times both a follower and an opponent of the student's output, and sometimes both.
12. Help student to be structured, where the success of scientific work is clear planning of the stages of its implementation. This allows you to avoid rushing, the confusion, which affect the quality of the research. The plan helps the student to find, process the primary sources on the topic. It is very important to teach the student the correct and competent execution of the work. As you know, it is built not arbitrarily, but in a certain structure, which is generally accepted for scientific works. This is the sixth condition for the success of the research. Serious preparation of the report and presentation for it is also required. The report reflects the main points of the scientific work; it should clearly state the goal, objectives, hypothesis and conclusion. It is necessary to emphasize the practical significance of the results. The presentation usually complements the report, illustrates it. Slides can contain definitions, theses, diagrams, diagrams, but, as you know, they should not duplicate the text of the report.
13. Training the students to be productive and correct thinking, where It is very important to teach the young researcher to present the material correctly, to be well-versed in the topic, to stay confident during the speech, not to be afraid of questions from the jury and listeners, and to express his opinion boldly.

Conclusion

The supervision process is a multifaceted teaching charge, demanding a guarantee of time and energy by both supervisor and student, where the supervisor is responsible for the quality of the research. A real supervisor is able not only to give valuable guidance, but also to accomplish a lot himself. The supervisor must have in-depth systematic knowledge in his research field; have extensive experience in methodical work, and the university. The thesis is a kind of mirror not only of a PhD student but also of his supervisor, where the supervisor is fully responsible both for the level of theoretical training of the graduate student and the timeliness of the dissertation and for its content.

The supervisor is also representing the first listener; with whom the student can rehearse the process of protecting the student work. On examination of the student's work, the mentor is obliged to direct the student in the right area should the student veer off. As a student understands, a supervisor is an authoritative person who will take a student under his wing. The onus lies with the student not to let him down. Therefore, the choice of

the supervisor is not an easy task, and it is worth taking it seriously and responsibly, since not only writing a good-quality dissertation but also its successful defense depends on its solution. Practice shows that the overwhelming majority of problems with the preparation of the thesis are connected precisely with scientific leadership.

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Qualifying Students in Private and Public Schools from Apucarana for the OBMEP

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Abstract: The university aims to form professionals through transmission and dissemination of knowledge, therefore, the Extension, as a tool of the universities, has a major role contributing to improvements in the learning and teaching process. The Extension projects are extremely important for The Federal Technological University of Paraná (UTFPR), since they increase the scope of citizens, benefiting them with research and knowledge. The project 'Qualifying Students in private and public schools from Apucarana for the Brazilian Mathematical Olympics for Public and Private Schools (OBMEP)', was designed with the objective of developing logical thinking in students, that participate on the project, as well increasing their interest in mathematics through the application of various activities, thereby helping to reduce the discrepancies in the learning process. The project also has the purpose to increase the number of qualified students for the second phase and medalists of the Maths Olympics. The idea is to provide ways to entertain students, trying to introduce greater dynamics to their studies. In 2019, some students of the project were awarded scholarships by the Institutional Program of Scientific Initiation Scholarships (PIBIC Jr), in which the scholarship's holder help in the development of research at the university. During the project, significant improvements of the participating students were noted, both in the school's grade and in the results of the Maths Olympics. The project was indeed beneficial for everyone (students and volunteers) since there was personal and academic growth for those who were willing to teach. With the progress of this project, the importance of the University Extension for the community became evident, since it is keen to contribute to the intellectual and personal growth of each individual involved.

Keywords: Mathematics, maths olympics, dynamics, activities, teaching process, public and private schools, personal growth

Introduction

The university is an important space for the production, accumulation and dissemination of knowledge, based on three interrelated bases: teaching, research and extension (UFES, 2013). Thus, talking about university and society, it is observed that extension has a secular role. According to João Antônio de Paula (2013) in "*The university extension: history, concept and proposals*", the origin of the university extension had two aspects, one disseminated in England and the other in the United States, where each was objectified in different factors. However, these were limited to capitalism and how to distribute knowledge without being detrimental to mass control, in addition to favoring those in charge, parties, church or capital leaders:

> Throughout history, the concept of university extension has undergone several guidelines and matrices, in which it ranges from extension courses, extension services, extension assistance, extension as a two-

Garcez, C. M., Vitor, D. H. C., Bortoli, M. M., Vieira, L. A., Prado, D. G. O. P. & Ramires, T. G. (2020). Qualifying Students in Private and Public Schools from Apucarana for The OBMEP. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 37-45), Washington, DC, USA. ISTES Organization.

> way between society and university, among others, with a new meaning extension with other academic tasks, and in their relationship with the community (SERRANO, 2012, p. 1).

Hence, university extension is one of the means in which it allows the sharing of knowledge acquired at the institution to happen (UFES, 2013). Paula (2013, p.6) states that university extension is what calls the university to deepen its role as an institution committed to social transformation, bringing the transmission and production of knowledge to its recipients, taking care of any flaws that they do that knowledge, science and technology are unequal.

University extension projects bring numerous contributions, one of which is the promotion and social, emotional and physical well-being, guaranteeing values, rights and duties to people. This has a fundamental role in the development of people who enjoy the projects, as well as academics. (MENDONÇA et al, 2013, p. 150).

> The extension has some characteristics that, if well explored, can contribute to a change in the process of teaching and learning: they have a different methodological arsenal; it is made up of meetings between students, teachers and communities; has the possibility, in this meeting, to incorporate other knowledge, to create a new common sense and to expand the capacity for reflection on practices, because they are constituted, that is, they are constituted by experiences (CASTRO, 2004, p. 5).

Therefore, such a project is the key for knowledge to be disseminated and worked equally among students and the community. For example, we have the Federal Technological University of Paraná (UTFPR), which has 13 (thirteen) campuses, being present throughout the state, so it is extremely important that large institutions like this develop extension projects aiming to reach the largest number citizens, thus being able to benefit them with their knowledge and research. For that reason, it is possible to understand the need for projects involving the community, and even more, students of basic education, who are at the peak of their development.

The project "*Qualifying students in private and public schools from Apucarana for the OBMEP*", aims to develop students' logical reasoning, provide more interest in mathematics, through various activities, in addition to finding talents, encouraging them and directing them to enter universities in the areas of science and technology. The UTFPR is a public university focused on technological courses, mostly engineering, making it easy to find volunteer students able and interested in teaching mathematics in general, for these children. The project also aims to increase the number of medals in Paraná, as well as to increase the number of students classified for the second phase, which happened less frequently at the beginning of the project in 2016.

Method

Academics and students who participate in the *"Qualifying Students in private and public schools from Apucarana for the OBMEP"* have the role to assimilate the learning in the classroom, for this reason, games of strategy and logical reasoning are made available and reproduced. By observing the unfolding of the teaching of mathematics and logical reasoning, such games contribute to the learning of formed and entertaining materials, thus making mathematics more playful. The students participating in the project are from public and private schools in the region of Apucarana-PR from the sixth to the ninth grade. The activities have your development at the institution itself (UTFPR). Analyzing the need of children in the city of Apucarana for educational support and the shortage of medals in the Olympics, it is possible to note the insufficiency in the area of mathematics and logical reasoning. Therefore, the project, implemented at UTFPR, tries to help fill this gap of students in their learning process.

The idea of the project is to bring more dynamics to learning by providing some ways to entertain students. The project, which has been going on since 2016, consists of face-to-face classes on Saturdays, on the UTFPR campus, where students solve lists prepared by volunteers, and have fun with educational games. The volunteer body consists of 27 students divided into groups of four members, who assist participants during classes. The lists are separated by three subjects: geometry, arithmetic and combinatorial analysis with probability and statistics.

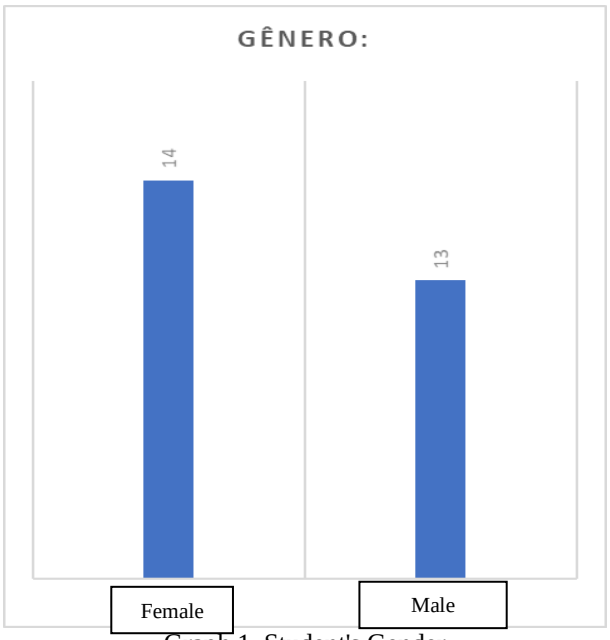
The project also have used the help of PIBICjr, that originated in 2019 with a national call for proposals that was launched at the CNPQ (National Council for Scientific and Technological Development), a government agency linked to the Ministry of Science and Technology, with the purpose of encouraging scientific and technological research and the training of Brazilian researchers, who would choose five projects to contemplate with scholarships of 100 Reais (almost 19 Dollars), for the six chosen students, given during one year, monthly.

The coordinator Danielle competed and was contemplated with one of these scholarships. Currently, scholarship students assist in the development of research at the university, accompanied by supervision of undergraduate students. For the 2020 year, new changes were adopted to the meetings, in which they start to occur from 8:00 to 11:40 o'clock in the morning instead of 10:00 to 11:20 o'clock. Having a determined time for the resolution of lists, interval and the application of games, among which are those purchased by sponsors, such as those created by the students of PIBICjr. Expected that with the development of the project, Apucarana will be able, in addition to increasing its medal index, to bring more pleasure to its children in learning mathematics, which also helps in their performance in schools in general.

Results and Discussion

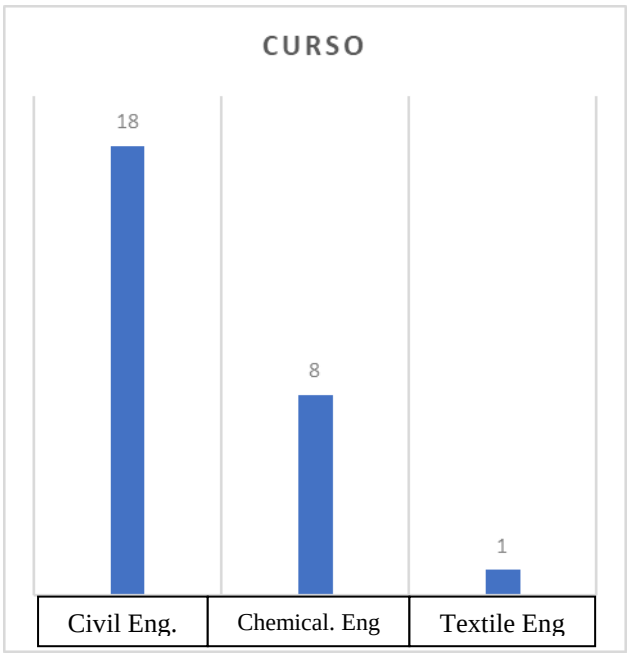
To begin with, an analysis of the profile of the volunteers who would work on the project was carried out, since they would be helping children in the community through monitoring, beyond to monitoring learning. As a result, it is possible to observe the importance and the total commitment that university extension projects have to the community. To this end, a form was prepared with the help of the "Google forms" application with the link bit.ly/conhecendovoluntarios2020, in which all voluntary participants should respond. The 27 students involved had divided tasks so that each one could do their homework in the best possible way, without overburdening anyone.

The form contained 10 questions. Among them were the student's gender; which course they was taking; the enrollment period of the volunteer in the system of the University; future area of activity; if it was already intended to study this area when they first enter their course; whether the volunteers already had contact with the teaching area; what would be this contact; what was the probability of them following an academic career; why did they choose to participate in this project, and finally, what were their expectations to the project. For the first question, Graph 1 was obtained with the responses of the volunteers. It was possible to observe that the number of volunteers of each sex was balanced; this can be an interesting factor since if any student felt more confident in answering their questions with a person of the same sex, they would be available to assist the child.

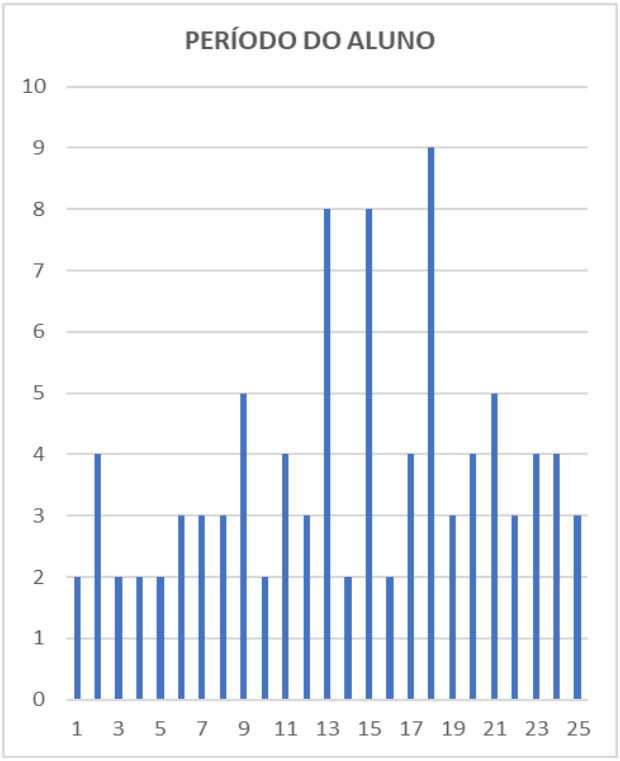


Graph 1. Student's Gender

Subsequently it was asked which course they were taking at UTFPR Apucarana, and what the system period they were enrolled in, such data was represented by Graphs 2 and Graph 3.

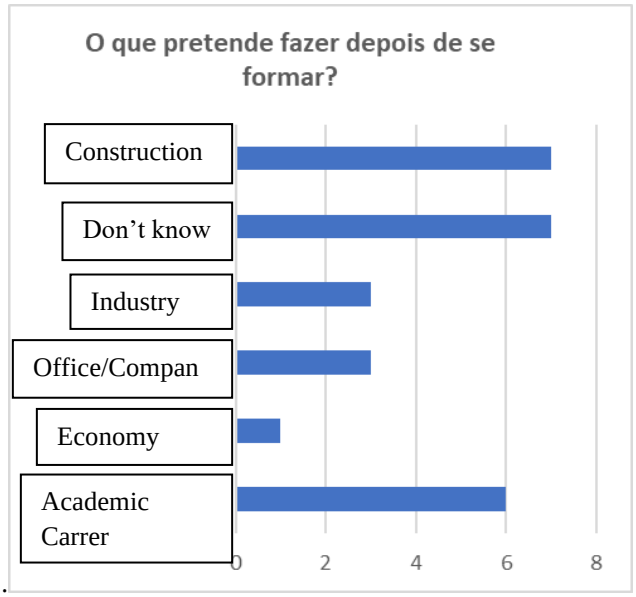


Graph 2. Volunteer's Course



Graph 3. Enrollment Period of the Volunteer in the System of the University

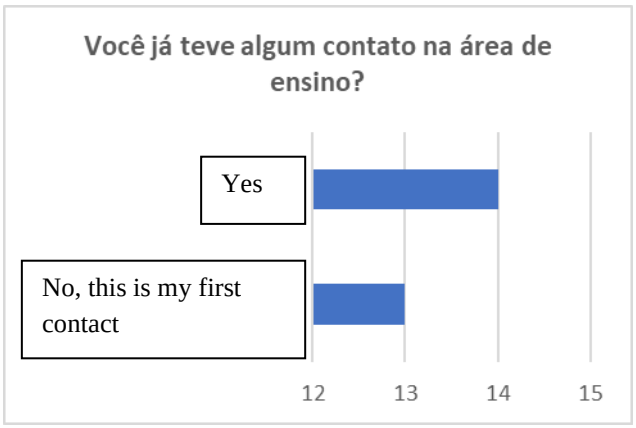
When analyzing the responses, it was possible to notice that large parts of the volunteers, 66.67%, were studying Civil Engineering, 29.63% were studying Chemical Engineering and 3.70% were studying Textile Engineering. With regard to the period they were attending, this proved to be quite diverse. The next graphs, Graphs 4 and 5, present the data related to future areas that the volunteers intend to act, related to their courses, as well as if this was already the intention when they chose the course.



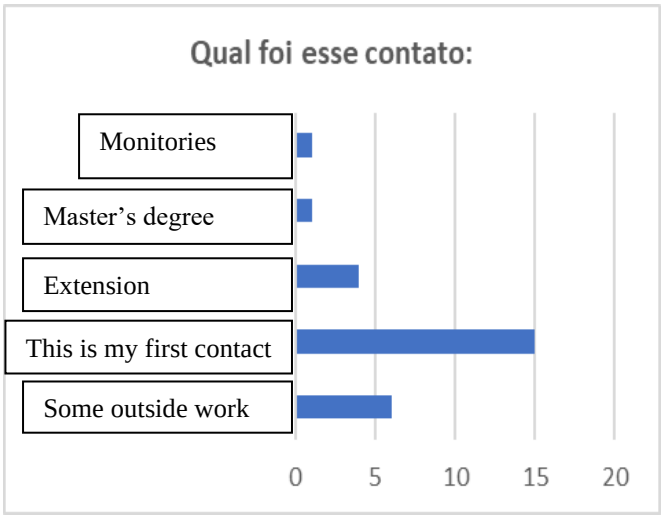
Graph 4. Future Area of Activity

Graph 5. When They Chose This Course, This Area was already intended to Study

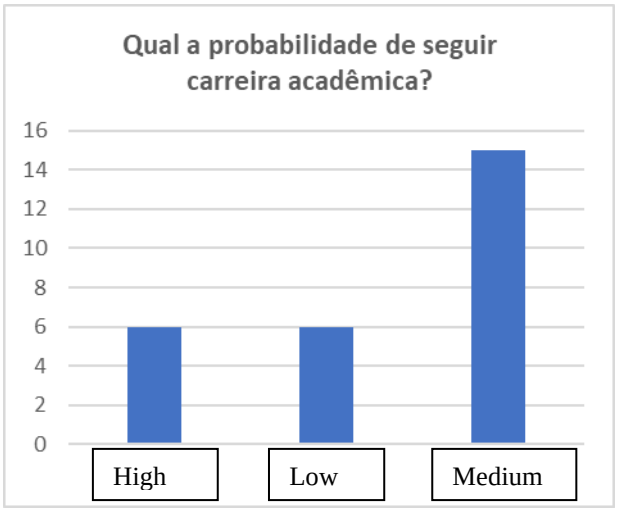
From Graph 5, it can be seen that a percentage of students changed their opinion regarding their future performance during the course, which may be related to various experiences provided by the university and extension projects, which allows a much broader view of society. The next questions evaluated were whether students had contact with the teaching area, what was this contact and what is the probability of continuing their academic career, the results can be evaluated in Graphs 6, 7 and 8, respectively.



Graph 6. Whether the volunteers already had Contact with the Teaching Area



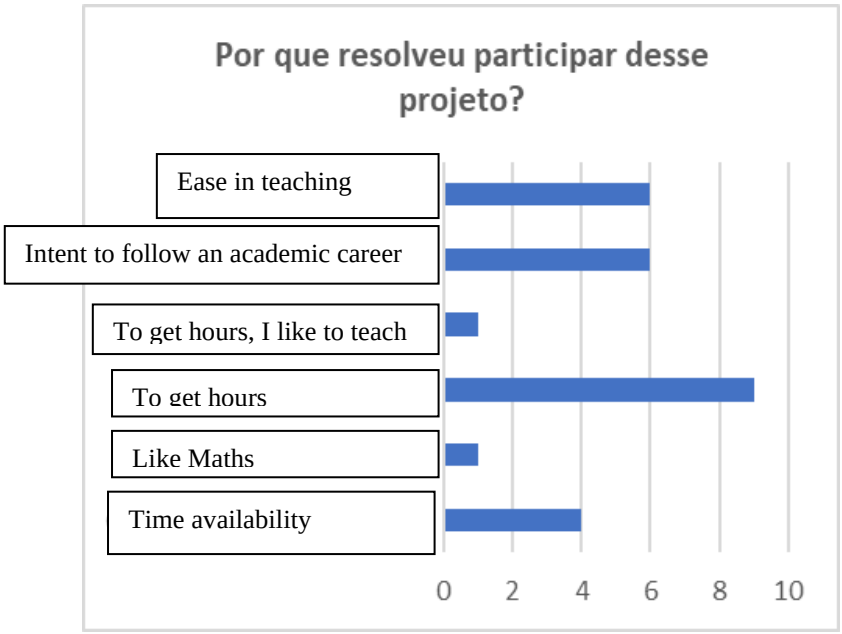
Graph 7. What was This Contact?



Graph 8. What was the probability of Them Following an Academic Career?

The responses obtained demonstrate that the number of students who have already had contact with the teaching area and those who have not had are almost equivalent, however the number of interested in pursuing an academic career has good rates, between medium and high probability. Thus, it is well known how university extension is of great relevance for the formation and direction of future academic careers.

Finally, it was asked why they chose to participate in the project, Graph 9, and what were their expectations for participating in the project, Table 1.



Graph 9. Why Did They Choose to Participate in This Project

Table 1. Volunteers' Testimonial with Their Expectations for the Project

Student x	Testimony
Student 1	Learn by teaching, and learn from life. I'm very closed in college, so I want to get involved in something. It will be good for the human side.
Student 2	Learning and experience.
Student 3	Helping other people to have more knowledge, just as I was helped; I know it will be a mutual learning.
Student 4	Learn and teach.
Student 5	Teach and learn together with others.
Student 6	Personal growth and contributing to the community.
Student 7	Have more contact with the area and gain more experience.
Student 8	Create ease in relating to different people, and have a small base of what it is like to "teach".
Student 9	Improve my math skills and develop communication skills.
Student 10	Hours, Experience.
Student 11	Grow as a person and professionally, try to learn how to teach.
Student 12	I hope to improve my communication and be able to pass on knowledge satisfactorily.
Student 13	To be able to contribute in the teaching of mathematics, knowing that there is a great lack of interest and a certain fear coming from some students in this area. Being able to show that we can learn in other ways, in addition to "dull" methods.
Student 14	Experience and learning.
Student 15	I hope to contribute by adding a little more knowledge to all children, in addition to being able to further improve my own knowledge, especially with the public. I also hope to learn more and improve my academic life with this project.
Student 16	Gain experience and see students learning.
Student 17	Get hours, assist in the project and gain more experience

Student 18	Being able to talk better with people and become more active
Student 19	get experience in the teaching area and relax.
Student 20	My purpose within the extensive project is to share knowledge. Whether acquiring or transmitting. Such a project still provides academic hours.
Student 21	Acquire knowledge and experiences.
Student 22	Improve my communication and ways of passing on what I know, in addition to acquiring more knowledge.
Student 23	Develop my teaching and get out of the classroom routine.
Student 24	Learn to teach and behave in a presentation.
Student 25	Having more contact with the external community and experiencing new experiences.
Student 26	Experience and improvement.
Student 27	Enhance teaching skills and encourage young people to discover the beauty of mathematics.

It is noted that in most of the responses presented in Table 1, the volunteers sought to learn and gain experience in the teaching area, as the project, in addition to providing opportunities for students from the 6th to the 9th years, it also contributes significantly to the growth of the volunteers and others involved. With the project being applied great results in the performances of the students have already been noticed, not only in Olympics, but also in schools, where they reported to present a better development in the subjects of mathematics. From Table 2 and 3, it is possible to observe the evolution of Apucarana students in the Olympics from 2016 to 2019.

Table 2. Comparison of the Number of Apucarana Medalists at OBMEP since 2016 of Both Levels

Level	Year	Medals	Honorable mention	Awarded
	2019	2	11	13
1	2018	4	13	17
	2017	1	12	13
	2016	0	8	8
	2019	1	10	11
2	2018	1	7	8
	2017	1	10	11
	2016	1	3	4

Table 3. General catch of the comparison of the number of Apucarana medalists at OBMEP since 2016

Year	Medals	Honorable mentions	Awarded
2019	3	21	24
2018	5	20	25
2017	2	22	24
2016	1	11	12

We can see from the Table 2 and 3, that since 2016 the awards given to Apucarana have been doubled in both levels, what shows that the project has achieved its purpose successfully. University Extension is extremely important for universities. With it, countless projects can be put in practice, through the transmission of assistance to the community, as well as the opportunity for professional growth for the volunteers. After the implementation of the project, "*Qualifying students in private and public schools from Apucarana for the OBMEP*", was noticed a great development of students and monitors, which could improve, both their individuals and collectives skills. Because of this improvement, the increase numbers of medals at OBMEP directed to Apucarana could be observed, consequently showing that the project achieved its purpose.

Recommendations

The games are indispensable so the project work out. Attached are some good games to use in some action like this, which are Catan, Carcassone, Rush Hour, dubble, War and Dix it. It important to tell that in somehow is good to search and try to teach them to make games with their own hands. They feel proud and learn more from that than just playing the purchase games.

Acknowledgements

To the project work, is fundamentally having a good advertising to get to the hidden whiz kids of the community, because they are there waiting to someone to push them up. Besides that, having a good volunteers that are in love about teaching is indispensable, because they are the front line in the monitories, they must have to be prepared to be there, to give the best they can, to the children. The volunteers have the mission to involve each child in the activities, so they want to be there, playing and learning from that.

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The Mapping of Language Teaching Materials of Indonesian for Foreign Speakers for Academic Purposes Based on Linguistic Characteristics

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Abstract: The learning of Indonesian for foreign speakers (bahasa Indonesia untuk penutur asing/BIPA) develops very fast. One of them is the People's Republic of China (PRC). In line with this, the government of PRC shows a serious intention to learn Indonesian language by sending their students to learn the Indonesian language in Indonesia through BIPA program. The success of BIPA learning depends on the learners' first language and teaching materials used. Therefore, in-depth studies on the linguistic characteristics of the BIPA learners are necessary to be conducted to acquire suitable teaching materials following the learners' needs. This research was conducted on eight students of BIPA for academic purposes program from China. This research was conducted by applying a qualitative descriptive approach. The findings on the linguistic characteristics of the BIPA students from China show three aspects. First, from the aspect of phonology, Chinese students do not really master the consonant sound pronunciation of Indonesian language, which is apparent from the inability and consistent mispronunciation in pronouncing certain sounds. Second, from the aspect of morphology, the students can construct words with some affixes that form the active form, but can't construct word using affixes that form the passive form. Third, the students have been able to construct a simple and complex sentence with two clauses, yet, they face difficulties in changing an active sentence to passive and vice versa. The three findings were then used to map the BIPA teaching materials, which later will be used for Chinese students in the future.

Keywords: Indonesian for foreign speakers, teaching materials, academic purposes, linguistic characteristics

Introduction

The development of Indonesian learning has increased significantly over time (Saddhono, 2016), including in the People's Republic of China (PRC). In the 1970s, there were only three universities that had Indonesian Departments in China. Thirty years later, there were six universities that opened the Indonesian Department so that there are nine universities in China that have the Indonesian Department (Xiaoqiang, 2014). Indeed, to show the seriousness in learning Indonesian, a number of universities in China have collaborated with universities in Indonesia by sending their students to learn Indonesian through the BIPA program (Indonesian for foreign speakers). In Indonesia, the teaching of Indonesian for foreign speakers began in an organized manner since the organization's declaration was declared on October 12, 1999 at the Indonesian University of Education. Indonesian learning for foreign students is called as BIPA. The participants in this activity are foreign students (not Indonesian speakers). In the learning process, Indonesian for foreign speakers is greatly influenced by the first language. This is in line with the opinion of Ellis (1995) who states that one aspect that affects the successful learning of learning person's second language or foreign language is his first language.

In addition to the first language, another aspect that affects the successful learning of BIPA is teaching materials (Kusmiatun, 2016) since teaching materials can be used for independent and structured learning. That is why the existence of teaching materials becomes essential in the learning process. Based on the objectives and characteristics of the participants, it can be seen that the learning needs of BIPA are different for each program. The differences of backgrounds are in accordance with the difference of characteristics of the students' language. The difference in language characteristics has implications for the difference of needs of teaching

Susilowati, N.E., Luciandika, A., Mardasari, O.R., & Zhao, Y. (2020). The Mapping of Language Teaching Materials of Indonesian for Foreign Speakers for Academic Purposes Based on Linguistic Characteristics. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020--International Conference on Humanities, Social and Education Sciences* (pp. 46-57), Washington, DC, USA. ISTES Organization.

materials needed by students (Patel, 2015). For this reason, different teaching materials which are in accordance with the characteristics of students' language are needed.

Good teaching materials are teaching materials that are in accordance with the characteristics of the students. That is, the material presented, the difficulty of the material, and the language used in teaching materials must be in accordance with the abilities or characteristics of students' language. In addition, the material developed must also be related to the context so that it is close to the students' life and the learning becomes meaningful (Cahyani & Hadianto, 2017). That is why, it is vital to know the characteristics of students in order to produce good teaching materials and in accordance with the characteristics of students' language. In fact, Moore (2009, p. 47) states that "Students learn more and retain more when the material they are learning is thought in a manner that is comfortable for them". Material that makes the students happy to learn will make them easier to comprehend knowledge of material.

To produce good teaching materials, adequate studies are needed on the initial behavior of foreign students, e.g. foreign students who participate in learning are adult (andragogy). This has implications for learning material which must be in accordance with the level of thinking of adult students and no longer children. In addition, the needs of foreign students in learning Indonesian are also diverse. According to Mackey & Mountford (1978), there are three needs that encourage someone to learn a language, i.e. (1) the need for working, (2) the need for vocational training programs, and (3) the need for learning. This implies to the learning material presented since the selection of material that is not in accordance with the characteristics of students will cause students to experience boredom and even difficulty in following learning.

Based on the learning objectives, there are two types of BIPA learning, i.e. BIPA for general purpose and BIPA for academic purpose. BIPA for general purpose is aimed to provide students a proficient Indonesian language that can be used in daily communication. The purpose of BIPA for general purpose is in line with the opinion of Sumardi (1974) which states that the goal to be achieved by someone in learning a foreign language is to be able to use the language learned correctly and fluently and can use the language in communicating. Meanwhile, BIPA for academic purpose is carried out to provide students a proficient Indonesian language for academic purposes.

In learning English for foreign speakers, there are two types of learning, namely English for general purposes (EG) and English for specific purposes (ESP) (Hutchinson & Waters 1987). ESP is divided into two types, namely English for academic purposes (EAP) and English for occupational purposes (EOP). Based on this, BIPA for academic purposes can be equated with EAP. BIPA for academic purposes and EAP has similarities, namely (1) both teach language to foreign speakers, (2) the learning objectives are for academic purposes, (3) participants of both programs are adults.

Universitas Negeri Malang (UM) is one of the tertiary institutions in Indonesia that organizes BIPA program. In fact, BIPA learning enthusiasts are increasing over years. The BIPA learning program at UM also varies with different participants' backgrounds, e.g. the participants of Critical Language Scholarship (CLS) Program who come from America, the participants of Darmasiswa Program who come from various countries, the participants of Training Program which come from Yala Rajabhat University of Thailand, the participants of the Developing Countries Partnership (Kemitraan Negara Berkembang/KNB) Program who come from various countries, and the participants of 3 + 1 Program which come from China.

Besides, the objectives of students of BIPA are also diverse, e.g. to improve Indonesian language proficiency, to teach Indonesian language, and to continue their studies in Indonesia. Based on these objectives, BIPA learning at UM can be divided into two types, i.e. BIPA for general purposes and BIPA for academic purpose. BIPA for general purpose is implemented in the CLS Program and the Darmasiswa Program, whereas BIPA for academic purpose is implemented in the KNB Program, Training Program, and 3 + 1 Program.

All this time, BIPA for academic purposes are not well implemented yet. That is, BIPA for academic purpose only carried out without really considering the program's implementation objectives, e.g. (a) the selection of learning themes that are sporadic and not in accordance with the learning objectives, and (b) the selection of teaching materials that are not in accordance with the learning objectives. Over the last few years, BIPA for academic purpose at UM using the book of *Sahabatku Indonesia* published by the Ministry of Education and Culture. However, the book is for general BIPA learning so the book cannot equip students with language skills for academic purposes. Besides that, BIPA learning with academic purposes has not received much attention

because of its relatively new presence in Indonesia, so far the learning and research of BIPA tends to focus on general BIPA learning and research.

The difference in terms of initial behavior, background, and objectives of BIPA students has implications for the differences in teaching materials used because good teaching materials are teaching materials that are in accordance with the student's goals (Karim, 2015), initial behavior, background, and first language. Moreover, in BIPA for academic purpose program, the existing teaching materials have not been developed even though the needs are very urgent.

Based on the assertions above, this research is essential to be conducted. Therefore, in-depth study of the mapping of teaching materials of BIPA based on the language characteristics of students from China needs to be done in order to produce good teaching materials and in accordance with the characteristics of students. Thus, the teaching material that is mapped is teaching material based on students' goals and students' language characteristics so that later it can be developed teaching materials that can be utilized maximally by the students. Suyitno (2017) and Soewandi (1994) stated that teaching materials needed by BIPA students consisted of two types, namely language skills and language knowledge materials.

However, in the context of BIPA learning for academic purposes, language knowledge teaching materials need to be immediately mapped because based on initial observations, students have difficulty mastering Indonesian because of their low Indonesian language knowledge. Language knowledge is mandatory for students if they want to master a language. Knowledge of the language includes knowledge of vocabulary and grammar. Related to this, Kusmiatun, *et al.* (2017) and Mufanti, *et al.* (2019) stated that vocabulary and grammar are an important material that underlies language activity and are integrally integrated to all existing materials.

Linguistic knowledge is very important possessed by foreign language learners. Based on the learning experience so far, BIPA students often experience difficulties, both in the aspect of understanding and in aspects of production. Misunderstanding, for example, in the form of errors in understanding the meaning of words or the meaning of sentences, while production errors, for example, in the form of errors in pronouncing Indonesian sounds, making form words, and making Indonesian sentences (Susanto, 2007). This misunderstanding or production is caused by their lack of linguistic knowledge. Therefore, linguistic knowledge based on the frequency of linguistic errors needs to be taken into consideration in the mapping and preparation of teaching materials.

The main objective of this research was to identify the language characteristics of BIPA students from China. The results will be used to map the teaching materials that will be developed into BIPA for academic purpose teaching materials for Chinese students.

Method

Participant

The participants of this study were eight third-year undergraduate students from Guangxi Normal University, China, who were studying Indonesian at Malang State University, Indonesia. The eighth age of these students is 20-22 years and all of them are female. The eight students are native speakers of Chinese and are taking courses in learning Chinese for speakers of other languages. However, when the research was conducted, the eight students took the BIPA for academic purposes program. Their purpose in taking the BIPA for academic purposes program is to teach Chinese to Indonesian speakers or to teach Indonesian to Chinese speakers.

Based on the results of the pretest, it can be seen that the initial ability of the eighth Indonesian language students is almost the same, which are all at the beginner level. However, in the development of learning, each student develops according to the individual abilities of students so that in the lecture process carried out during one semester, there are two students whose abilities increase dramatically to the pre-advanced level, while the other four go up to the intermediate level, and the other two are still at the beginner level. This is caused by intelligence and learning motivation factors of different students.

Data

This research data is in the form of student speech in learning process and sentences written by students in students' daily journals. Therefore, the data of this research were in the form of oral verbal data and written verbal data. Oral verbal data were in the form of transcriptions of students' utterances during the learning process. Written verbal data were in the form of written lingual features obtained from students' writing in the form of journals containing a number of essays about their activities, experiences, and feelings. Both types of data are used to identify the language characteristics of students which include linguistic characters from phonological, morphological, and syntactic aspects.

The data was obtained by observing of learning activities, transcriptions of students' utterances, and students' daily journals. Observing the learning activities and transcriptions of students' utterances were carried out to identify phonological characteristics, while observing the students' daily journal were carried out to identify morphological characteristics and syntactic characteristics.

After the students' language characteristics were identified, the next step was to map the teaching material based on phonological, morphological, and syntactic aspects. The mapping was done using the principle of language learning, i.e. from close to far, from easy to difficult, from simple to complex, from few to many, and so on. This mapping will be useful for the development of teaching materials that can be done as further research.

Data Collection

This research was conducted from September 2018 until February 2019. Data collection was carried out by observing and recording learning activities in class. Classroom learning activities are carried out for five days each week, from Monday to Friday. In addition, every Friday, students also collect student daily journals to lecturers. The journal is then duplicated to become a data source. The journals written by these students are natural because when writing the journal, students are not accompanied by a lecturer. Thus, the real ability of students in using Indonesian can be seen from the daily journal.

Results

The results of this study are in the form of findings about linguistic characteristics in oral and written communication of Chinese students. These characteristics are distinguished by characteristics from phonological, morphological, and syntactic aspects. A summary of research results on the characteristics of the three aspects is presented as follows.

Table 1. Student Language Characteristics

No	Aspect	Frequency
A	**Phonological Aspect**	
	The ability to pronounce vowel sounds [a], [i], [u], [e], [o], [ə] and their variations	80.47%
	The ability to pronounce sounds [r]	39.84%
	The ability to distinguish sounds [p] and [b], sounds [t] and [d], and sounds [k] and [g]	46.87%
	The ability to pronounce syllable [ɔn]	53.15%
B	**Morphological Aspect**	
	The ability to produce formed words with the affixes *meN-*, *ter-*, *ber-*, dan *peN-*	86.75%
	The ability to produce formed words with the affixes *meN-kan*	83.36%
	The ability to produce formed words with basic forms begins with *k*, *p*, *t*, and *s* with affixes *meN-*	65.72%
	The ability to produce formed words with the affixes *di-*	78.14%
	The ability to change formed word with the affixes *meN-* to the formed word with the affixes *di-*	47.2%
	The ability to produce full repetition words	21%
	The ability to produce partial repetition words	1.25%

	The ability to produce compound words	1.56%
C	**Syntactic Aspect**	
	The ability to produce zero endocentric phrase (contain one words)	100%
	The ability to produce attributive endocentric phrase	100%
	The ability to produce appositive endocentric phrase	0%
	The ability to produce coordinative endocentric phrase	100%
	The ability to produce basic sentences	100%
	The ability to produce passive voice	78%
	The ability to change active sentences to passive voice or vice versa	47.74%

Phonological Characteristics

In the early stages of learning Indonesian, students were introduced to the Indonesian sounds. This was intended so that students could memorize and distinguish Indonesian sounds. Moreover, there are quite striking differences between Indonesian and Chinese. This difference can be seen from (1) the availability of language sounds in Indonesian, but not in Chinese, and (2) there are differences in how to pronounce Indonesian sounds with Chinese even the writing of the symbol is the same. This condition causes students to experience difficulties and even errors in pronouncing Indonesian sounds.

The analysis results of the Chinese students' pronunciation during learning process in 3 + 1 Program showed that students are able to pronounce vowel sounds even though vowels in Indonesian have more than one phoneme. Students were able to pronounce the sound [a], [i], [I], [u], [U], [e], [Ɛ], [ə], [o], and [ɔ]. However, students still have difficulty in distinguishing sounds [e], [Ɛ], and [ə], e.g. in pronouncing *[tempe]*. When they were asked to pronounce the word *[tempe],* they pronounce it as *[təmpə],* not *[tempe]*. After being introduced to the correct sound, they can pronounce the word *tempe* relatively correct. However, there are some students who are mistaken in pronouncing the word.

In consonant sounds, the results of the analysis showed that students in general are able to pronounce consonant sounds well. However, students experience errors consistently in producing certain sounds. The consonant sound is the sound [k] and [g], [t] and [d], [p] and [b]. In these consonants sounds, students were often confused in pronouncing them, for example sounds [k] pronounced as [g] and sounds [g] pronounced as [k]. In consonant sounds, the analysis also showed that students are not able to pronounce the sound [r], both the sound [r] are in the onset or in coda position, especially pronounce the sound [r] in the coda position. The error in pronouncing the sound [r] is due to their unfamiliarity because in their language system, this sound does not exist. As a result, they cannot (or are not accustomed to) pronounce the sound [r].

In the sound cluster, the analysis showed that students are not able to pronounce syllables ending in vowels and consonants *on*. This is because in Chinese, there is no sound cluster [*on*]. That is why, when they pronounced Indonesian words that end with a sound cluster [on], students were wrong. For instance, the word [*pɔhɔn*] tends to be pronounced as [*pɔhɔŋ*] and the word [*rawɔn*] tends to be pronounced as [*rawɔŋ*].

From the results of the analysis, the particularity that appears in the phonological aspects of Chinese students is the influence of Indonesian pronunciation of Chinese, especially the uniqueness in pronouncing consonant sounds. This particularity is because the students tend to use their language system (Chinese) in pronouncing the target language (Indonesian) (Susilowati, Chen, & Xie, 2018). This particularity is seen especially when students pronounce the sounds of voice and voiceless consonants that are in the same articulation area. For instance, in pronouncing sound [d], students tend to pronounce it with sound [t]. This happens because in Chinese system, the sound [d] is pronounced with [t]. This way of pronouncing is the Chinese student's peculiarity in pronouncing the sounds of Indonesian consonants.

Morphological Characteristics

In the morphological aspect, the analysis was conducted on students' written communication as set out in the weekly journal. The characteristics of the morphological aspects were analyzed in the formed words obtained from the morphological process which included affixation, reduplication, and composition (Sumadi, 2013). Affixation is the process of forming words which is done by combining basic forms with affixes. Reduplication

is the process of forming words which is done by combining basic form with R morpheme. Composition is the process of forming words which is done by combining basic forms with other basic forms so as to produce new words whose meanings deviate from their basic form.

Morphological characteristics related to vocabulary used and produced by students which include basic words and word formations. In foreign language learning, vocabulary is an important aspect that determines the mastery of the target language by students. In fact, the results of research by Sujana, et al. (2018) stated that 91% of BIPA teachers who are the subjects of their research agree that vocabulary material is compulsory material that is taught explicitly in BIPA learning.

Research findings on the morphological characteristics of written communication of Chinese students are presented below. From the aspect of affixation, the results of the study showed five things. The following is the explanation.

- First, students have been able to produce words by using affixes, especially prefixes and suffixes correctly. The affixes used by Chinese students are verb-forming affixes, noun-forming affixes, and adjective-forming affixes.
- Secondly, the affixes that are most correctly mastered by Chinese students are the affixes of *meN-*, *ter-*, *ber-*, dan *peN-*. The affix *meN-* which is often used by students is the affix *meN-* forming verbs which states the meaning of doing such actions in the basic form, e.g. *membaca* ‘reading activity’. The affix of *ber-* that is often used by students is the verb forming affix which states the meaning of (1) doing the action as mentioned in the basic form, e.g *belajar* 'doing teaching activities'; and (2) ownership, e.g. *beradik* 'having a sister'. The affix of *ter-* that is commonly used by students is the affix *ter-* (1) verb formers which state the meaning of doing something like in the basic form ', e.g. *tersenyum* 'doing smiling activities', and (2) forming an adjective which states the meaning of most, e.g. *tertinggi* 'the highest'.
- Third, students are able to use the confix of *meN-kan* correctly. The confix of *meN-kan* is commonly used by students. The confix of *meN-kan* used by students is the confix of verb forming which states the meaning of (1) doing the act in the basic form, e.g. *menggunakan* 'doing the act of use', (2) making in the basic form, for example *membosankan* ' make you bored ', and (3) make it in the basic form, for example *menyiapkan* ' make ready '.
- Fourth, students tend to experience difficulty in forming the words with basic forms beginning with the consonant sounds *k, p, t,* and *s* with the affix *meN-*. In Indonesian, the basic form begins with consonants *k, p, t,* and *s* if they get the affix, they will be assimilated, e.g. *meN-* meet the basic form of *kupas*, it will become *mengupas* (*k* consonant assimilated). This rule seems not to be understood by students so that they tend to have difficulty when producing words that begin with the consonants *k, p, t,* and *s* with the affix of *meN-*. In fact, if the students are asked to find the basic form of word form which gets an affixes *meN-* with the basic form beginning with the sound of consonants *k, p, t* and *s,* students tend to be mistaken. For example, when they are asked to find the basic form of the word *mengupas*, students tend to determine the basic form is *ngupas* or *upas*.
- Fifth, students have particularity in producing words affixed *di-*. These peculiarities are in the form of (1) students can produce word formations with affixes of *di-*, but tend to experience difficulty in using these words in the context of sentences, and (2) students tend to experience errors in changing the active form of the affix of *meN-* to the passive form of the affix of *di-*.

From the reduplication aspect, students are able to produce repetition words. The repetition words produced by the students are whole and partial repetition words, while the affixes and changing sound repetition word are not found in the student's writing. The repetition words produced by students are also very limited, i.e. as many as five words for whole repetition words and two words for partial repetition words. Whole repetition words produced by students are whole repetition words that (1) express a lot, e.g. *teman-teman* 'many friends', and (2) express with, e.g. *pelan-pelan* 'slowly'. The partial repetition words that is produced by students is a partial repetition words that states to perform the action mentioned in the basic form, e.g. *berjalan-jalan* "doing the act of walking".

From the aspect of composition or compounding, students are only able to produce two compound words, i.e. *makan-makan* 'eat at night' and *baik hati* 'people who have good character'. Compound words produced by students are limited to compound words consisting of two words.

Syntactic Characteristics

Syntactic characteristics can be viewed from three aspects, i.e. aspects of phrases, clauses, and sentences. The results of research on the syntactic characteristics found in Chinese students' written communication are described as follows:

- From the aspect of phrases, based on data analysis on Chinese students' written communication, three findings were obtained. First, based on the distribution equation with the elements, the phrases produced by students are endocentric zero phrases, attributive endocentric phrases, coordinative endocentric phrases, conjunctive exocentric phrases, and disjunctive exocentric phrases with prepositions as markers. Second, based on the class of words that are the central element or markers, the phrases produced by students are noun phrase, verb phrase, adjective phrase, preposition phrase, and conjunction phrase. Third, phrases not found in students' written communication are appositive endocentric phrases, exocentric phrases disjunctive with articles as markers, and articular phrases. Fourth, based on their numbers, phrases that Chinese students can produce are phrases with a total of one to five words, but the most common are phrases consisting of only one word. The complete data of research findings about phrases produced by Chinese students can be seen in Table 2.
- From the aspect of clauses, the results of this study showed that the clauses found in written communication of Chinese students are complete clauses (clauses consisting of subjects and predicates) and incomplete clauses (clauses that do not have subjects and / or predicates). From the complete clauses found, there are also an orderly arrangement of clauses (clauses whose subject precedes the predicate) and inversion clauses (clauses whose predicate precedes the subject).
- From the aspect of the sentence, the results of the study showed four things. First, students are able to produce basic sentences with one subject and one predicate correctly, whether accompanied by non-clausal information or not. Second, students are able to produce complex sentences with one statement in the form of clauses correctly. Third, students have difficulty in composing passive sentences with the predicate in the form of verbs with affixes of *di-*. Fourth, students have difficulty in changing active sentences into passive sentences.

Table 2. Phrases Produced by Chinese Students

No	Phrase	Yes	No	Explanation
1	The phrase is based on the distribution equation with its element			
	a. Endrocentric phrase			
	(1) Attributive endocentric phrase	√		
	(2) Coordinative endocentric phrase	√		
	(3) Apositive endocentric phrase		√	
	(4) Zero endocentric phrase	√		
	b. Exocentric phrase			
	(1) Conjunctive exocentric phrase	√		
	(2) Disjunctive exocentric phrase	√		With prepositions as markers
2	Phrases based on the class of words that are the central element or markers			
	a. Noun phrase	√		
	b. Verb phrase	√		
	c. Adjective phrase	√		
	d. Numeral Phrase		√	
	e. Prepositional phrase	√		
	f. Conjunction phrase	√		
	g. Articular phrase		√	

Discussion

Linguistic Characteristics of BIPA for Academic Purposes Students from China

The mapping of BIPA teaching materials for Chinese students, especially teaching materials for linguistic aspects, is based on the found characteristics. Teaching materials presentation is done based on the principle of easy to hard, from few to many, from the concrete to abstract, and from close to far. Besides, the mapping of

teaching materials is also done by giving emphasis and repetition on materials that are difficult to master by students or on material that students often experience errors. The mapping of teaching material is presented as follows.

In terms of phonological aspect, it can be seen that students have no difficulty in pronouncing and distinguishing vowel sounds and their allophones. However, students have difficulty in pronouncing consonant sounds, especially consonant sounds [p] and [b], [k] and [g], and [t] and [d]. The difficulty is caused since the students experience errors in producing these consonant sounds. Dawud (2008) argues that language errors can be in the form of errors of understanding or production (Dawud, 2008). Based on this sorting, the mistakes in the pronunciation of sounds made by Chinese students are errors of understanding as well as errors in production. Misunderstanding is caused since students do not understand the Indonesian system, e.g. the grapheme *b* is pronounced [b], unlike Chinese where the grapheme [b] is pronounced [p].

In the early stage of learning, mistakes in pronouncing the consonants made by Chinese students caused interference with the first language system. However, in its development, errors in pronouncing the consonants sounds made by Chinese students are caused by errors in producing sounds in the target language system. This is in line with the opinion Dullay, Burt, & Krashen (1982) who found that learners' mistakes in learning a second language or a foreign language were caused by first language interference, errors due to language development (use of intermediate languages), and unique errors.

In terms of morphological aspect, students master well the affixes forming verbs in the form of affix *meN-* and *ber-* along with their variations and their meanings. This is because the main verb that is often used in Indonesian is the active verb. In Indonesian, the formation of active verbs is done by adding *meN-* and *ber-* to the basic form. More than that, the active verb is often used in communication because the basic sentence patterns in Indonesian are active sentences so that automatically, the formation of active verbs is also immediately mastered by students. This is in line with what is stated by Dardjowidjojo (2003) which states that the first affix mastered by Indonesian students is one of them is the affix *meN-*.

The results of the study also showed that students can produce a repetition word although not all words can be produced by students. The most repetition words produced by students are whole repetition words, e.g. the words of *teman-teman*. The ability of students to produce this whole word can be understood because this word is the most easily produced word than any other word. The form of the whole word is the same as its basic form so it does not make the students confuse. This is different, e.g. with partial repetition word because to produce it, students still have to think which parts are left off and which parts are retained in the form of the invented word.
In terms of syntactic aspects, students master well the basic sentence structure of subject and predicate patterns. This finding showed that students are already good enough in producing simple sentences because students are able to present the P function in their sentences given (Parera, 2009; Alwi, dkk., 2003). The ability to produce simple sentences by students because the sentence patterns are the most basic sentence patterns found in all languages. In addition, basic sentence patterns are the simplest sentence patterns that can be used to express ideas.

The Mapping of BIPA Teaching Materials for Academic Purposes

Based on the discussion of the characteristics of Chinese students, the mapping of BIPA teaching materials is described as follows. The linguistic characteristics found are used to (1) determine selection of criteria and choice of teaching materials presented and (2) determine the order or gradation of BIPA teaching material presentation. In addition, the findings are also used to determine what aspects are needed highlighted and on what aspects are not need to be highlighted (Susanto, 2007).

The mapping of language teaching material is categorized into the mapping of phonological, morphological, and syntactic aspects. The mapping is sorted based on the initial ability mastered to the ability that is difficult / not mastered by students. This is in line with the opinion of Suyitno (2017) which states that BIPA learning, words, formations, sentences, and grammar used are words, formations, sentences, and grammar language that is known by the students.

Ideally, BIPA learning is divided into three levels, i.e. beginner level, intermediate level, and upper level (Suyitno, et al., 2018). However, for BIPA learning for Chinese students, this division is not done because their initial competencies are the same (both beginner level), but the expected outcome is that they can have advanced

competencies. They were asked to practice teaching Chinese for Indonesian speakers and/or teach Indonesian for Chinese speakers. Therefore, teaching materials developed for BIPA students from China are different from teaching materials for other BIPA programs.

In mapping from phonological aspects, the material of vocal sound is taught earlier than the consonant sound because they have no difficulty in pronouncing vowel sounds. After that, consonant sound material is taught. In consonant sound material, the proportion of the presentation of consonant sound material [p] and [b], [k] and [g], and [t] and [d] is reproduced and repeated because this material is difficult for Chinese students to master. After consonant material is presented, the material presented is double vowel material and double consonant material. The double vowel and double consonants materials are also difficult for students to master. However, these materials do not get as much emphasis and repetition as the presentation of consonant material as mentioned earlier.

In the mapping of the morphological aspects, the affixes of *meN-* and *ber-* are presented earlier than other affixes because these affixes are mastered by students. The affixes that are then presented are the affixes of *ter-*, *peN-* and *-an*. The confix is the next material given since this material is more difficult to be mastered by students. The affix that is difficult to be mastered by students is the affix *di-*, both for its formation and its use in sentences. Therefore, affixes are presented later and get more proportions because students need to learn more about these affixes and their use in sentences. For repetition words, the earliest word presented to students is a whole word, followed by a sound changing word, partial word, and affixed repetition word. The vocabulary introduced to students is not only basic vocabulary, but also formed vocabulary which includes (1) vocabulary in the form of scientific field terms, and (2) standardized Indonesian vocabulary.

In mapping of syntactic aspects, the first material presented is the basic sentence material patterned with subject and predicate because this material is mastered by students. After that, the sentence material presented is sentence material with non-clausal adverb. Next, after the structure of the sentence patterned subject, predicate and adverb have been mastered by students, the next material presented is a sentence with adverb in the form of clauses. The most difficult sentence material for students to master is passive sentences, especially passive sentences with predicates in the form of affixed verbs along with their combinations, both the initial formation of passive sentences and the change from active sentences to passive sentences. Therefore, material about passive sentences and their types of forms is presented in the last.

Material syntactic aspects not only contain material about the pattern and structure of Indonesian sentences but also supported by the practice of their use in communicating for academic purposes. Thus, students are expected to not only understand the rules of sentences in Indonesian but also be able to use them appropriately in various contexts. The mapping of teaching materials based on linguistic characteristics for Chinese students is reflected in the Table 3.

Table 3. The Mapping of Teaching Material Based on Language Characteristics

No	Linguistic Aspects	Target Competence	Explanation
1	**Phonological aspect**		
	a. Vocal sound	students can pronounce Indonesian sounds correctly, both vowels and their allophones, consonant sounds and their allophones, vocal groups, and double consonant	
	b. Consonant sound, mainly */p/* and */b/*, */k/* and */g/*, also */t/* and */d/*		Get more repetition and highlighted
	c. Vocal cluster and double consonant		
2	**Morphological aspect**		
	a. Affixes *meN-* dan *ber-*	• Understanding the affix word in Indonesian	
	b. Affixes *ter-*, *peN-*, dan *-an*		
	c. Confix		
	d. Affixes *di-*	• The vocabulary introduced is in the term of scientific field and standard Indonesian vocabulary	Get more repetition and highlighted
	e. A whole repetition word,	Understanding Indonesian	

	repetition word changing sound, partial repetition word, and affirmative repetition word.	repetition word	
3	**Syntactic aspect**		
	a. Basic sentence patterned Subject and Verb	understanding the simple sentences	
	b. Basic sentence patterned Subject, Verb, and Adverb (non-clause)	understanding the complex sentence	
	c. Basic sentence patterned Subject, Verb, and Adverb (clause)	understanding the complex sentence	
	d. Passive sentence (including changes from passive to active and vice versa)	Understanding the passive sentence and its changes	Got more repetition and highlighted

BIPA learning materials are presented in stages based on the level of difficulty, which is from easy to difficult, simple to complex, from few to many, and close to far. This shows that there are gradations in the presentation of BIPA teaching materials. The presentation of BIPA teaching materials is then manifested in learning themes. The determined theme is also a theme with gradations as stated.

As it is for BIPA for academic purpose, the materials no longer raise the theme of themselves and the environment, but rather on themes that support academic interests. However, BIPA for academic purpose for students from China, the themes of themselves and the environment are still presented because the initial ability of students is still at the beginner level. However, the materials that are themed and the environment are presented in small proportions.

From the three language aspects of BIPA learning, there is an order of importance and quality. From those three aspects, the material on morphological aspects is the most important part, especially in terms of vocabulary. This can be understood because vocabulary is an important part of learning a second/foreign language. The vocabulary that is dominated by students will affect their ability in Indonesian. These findings form the basis quality of the linguistic material presented to students, followed by syntactic aspects, and finally phonological aspects. However, the material for phonological aspects is presented at the earliest because the pronunciation of language sounds will affect vocabulary production.

Related to language skills, BIPA for academic purposes prioritizes learning writing skills. However, because the early abilities of students from China are still at the beginner level, learning to speak takes precedence because they need good speaking skills. After speaking, the language skill presented is writing because during further studies, they will be required to write in Indonesian. Furthermore, to produce good writing, students are required to be good readers so that the material presented next is reading the material. Finally, the last material presented is listening. Thus, based on their needs, the order of presentation of language skills material for students from China is speaking, writing, reading, and listening.

The findings of this study are not in line with Troike (2006) who gives priority order of foreign language learning activities for academic purposes. According to Troike (2006), the sequence of learning activities for language skills for foreign students is reading, listening, writing, and speaking. This sequence is slightly different from the priority order of learning activities of students of BIPA for academic purposes from China. Table 4 shows a comparison of the priority order of learning activities according to Troike and the needs of students of BIPA for academic purposes from China.

Table 4. Comparison of Priority Sequence for BIPA for Academic Purposes Activities

Priority sequence	**Students of BIPA for Academic Purposes from China**	**Troike**
1	Speaking	Reading
2	Writing	Listening
3	Reading	Writing
4	Listening	Speaking

Conclusion

The findings on the linguistic characteristics of the BIPA students from China show three aspects. First, from the aspect of phonology, Chinese students do not really master the consonant sound pronunciation of Indonesian language, which is apparent from the inability and consistent mispronunciation in pronouncing certain sounds. Second, from the aspect of morphology, the students can construct words using affixes *meN-* and *ber*, but can't construct word using affixes *di-*. Third, the students have been able to construct a simple and complex sentence with two clauses, yet, they face difficulties in changing an active sentence to passive and vice versa. The three findings were then used to map the BIPA teaching materials, which later will be used for Chinese students in the future.

The mapping of teaching materials on the linguistic aspects was conducted with a principle of order and emphasis on materials based on the findings of characteristics. The order was conducted based on the principle of easy to difficult by presenting the materials that are already comprehended prior to the materials that are intermediate, not understood, or difficult to comprehend. The emphasis was conducted by giving more portions to the materials that are not understood or difficult to comprehend. The learning materials are in a form of standard Indonesian language.

Recommendations

The development of teaching materials for BIPA learners with academic objectives is very dependent on the learning objectives and the students' language characteristics. The linguistic characteristics are related to linguistic knowledge and the frequency of linguistic errors that are often done by students. The results of this study indicate that the mistakes made by students can be used to map language learning materials in BIPA programs for academic purposes.

Based on the findings of this study, researchers gave two recommendations. First, the mapping of teaching materials alone is not enough to be used as a reference in learning so that teaching materials based on the mapping are needed. Therefore, it is necessary to develop language teaching materials specifically presented in BIPA learning for academic purposes. Second, although linguistic knowledge is very important to be given to students so that teaching materials need to be developed, it is also important to develop language skills teaching materials because linguistic knowledge will be more quickly mastered if learning is also in line with learning language skills.

Acknowledgements

This research was funded by Hibah Penerimaan Negara Bukan Pajak (PNBP)/Non-Tax Revenue Grant. We thank to the research assistant for their great efforts for helping this project in data collecting and data transcription. Also, we thank the families, students, school staff, and colleague for their participation and support for helping and assisting with this study..

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An Alignment of Bachelor of Early Childhood Education Curriculum per Philippine Professional Standards for Teachers (PPST): Basis for Teacher Quality Framework for ECE Pre-service Teachers

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Abstract: This study focused on aligning the Bachelor of Early Childhood Education Curriculum Components per PPST to come up a teacher quality framework for ECE pre-service teachers in the Philippines. Using unpacking of beginning teachers' indicators (BTIs) in PPST and content analysis, distinct competencies were ascertained. A total of eight participants were commissioned as panel of experts to unpack the BTI"s in the PPST. Based on the result of the study, thirteen distinct competencies were identified to be included in the teacher quality framework, namely: a) demonstrate learnedness the content of ECE specifically the holistic development and learning of the children, b) apply teaching strategies that are developmental and play-based in all learning areas to include ICT and mother tongue to facilitate the teaching-learning of the children, c) develop skills in networking and collaboration with relevant stakeholders to improve learning programs practices, d)inculcate the value of respect in diversity in school and whole community, e) display pride and commitment on professional ethics, f) display pride and commitment as early childhood educators, g) set-up a nurturing and inclusive learning environment for children, h) design conducive environment for learning and development, i) implement differentiated and developmentally appropriate practice for diverse children, j) prepare responsive ECE learning programs, k) address learning goals and outcomes by applying systematic use of appropriate assessment tools and methods, l) able to work collaboratively to improve teaching practice, and m) demonstrate understanding on systematic use of appropriate assessment tools and methods. Hence, the teacher quality framework designed for ECE pre-service teachers may be put-upon as practical guide for the Teacher Education Institutions in order to prepare their graduates the beginning competencies needed when they are employed in the field.

Keywords: Bachelor of early childhood education curriculum, Philippine professional standards for teachers, ece pre-service teachers, teacher quality framework, teacher standards

Introduction

A teacher quality framework for Early Childhood Educators is geared towards providing relevant support for tertiary teachers in a quest to produce graduates with relevant trainings in the field. While the Philippine Professional Standards for Teachers (PPST) aspired to provide a quality academic training to every pre-service teacher; still, it seemingly has insufficient mechanisms to make sure the Early Childhood Education tertiary students are provided with the applicable training needed to be equipped.

Similarly, in most countries the national standards for teachers are generic. This is reflected in the survey conducted by Southeast Asian Minister of Education, Organization, Innovation and Technology (SEAMEO INNOTECH, 2010), in the Southeast Asian countries namely; Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, Viet Nam and most of all; the Philippines. Furthermore, as mentioned by Call (2018), the countries whose current position in the 2016 PISA tables range from 1 – 27th; particularly the UK, Japan, US, China, Finland and Singapore still share the same practice having general national standards for teachers. However, it is very important to note that UK, USA and England are on the verge of institutionalizing teacher standards for Early Childhood Education.

In the Philippines, the Bachelor of Early Childhood Education (BECEd) curriculum remodel to learning competency-based/outcomes-based education. Core competencies are laid down by the Commission of Higher Education as reflected in CMO No. 76 or the "Policies, Standards and Guidelines of BECEd". It is clear in the said CMO, the expected competencies the BECEd students must adhere regardless of what HEI they come from. However, it is apparent that there is still a gap in terms of inculcating to students what is to be an early childhood educator seeing the teacher standards crafted is generic. For this reason, it is all the same perplexing to students what are expected from them in the field since they are refined to generic teacher standards.

Almasa, R. D. (2020). An Alignment of Bachelor of Early Childhood Education Curriculum per Philippine Professional Standards for Teachers (PPST): Basis for Teacher Quality Framework for ECE Pre-service Teachers. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020--International Conference on Humanities, Social and Education Sciences* (pp. 58-93), Washington, DC, USA. ISTES Organization.

More likely, if the BECEd curriculum components and PPST are aligned, a distinct teacher quality framework for ECE is designed. In particular, the researcher sought to determine the confounding indicators in the PPST in order to translate them to be applicable in ECE settings. Hence, the researcher was interested to conduct this study for the ECE pre-service teachers have a clear frame of reference on what are the expected competencies they shall demonstrate when they are in the field.

Review of Related Literature

Philippine Professional Standards for Teachers

The definition and purposes of Philippine Professional Standards for Teachers (PPST) are stipulated in DepEd Order No. 42, s. 2017. In this order, it is explained that PPST was built on National Competency-Based Teacher Standards because of the various national and global frameworks to mention, K to 12 Reform, ASEAN Integration, globalization and the changing character of the 21st century learners. PPST complements the reform initiatives on teacher quality from pre-service to in-service training. It articulates what constitutes teacher quality in the K to 12 reform through well-defined domains, strands, and indicators that provide measures of professional learning, competent practice and effective engagement. The said professional standards include seven domains.

The first domain is "content knowledge and pedagogy." In this domain, the teachers are expected to value the essence of having proficiency in content knowledge and its interrelationship within and or across curriculum areas. Besides, having an in-depth understanding of the employment of theories and principles of teaching and learning. More importantly, exercising developmentally appropriate and suggestive pedagogy with the basis on content knowledge and current research. Also, it is expected from the teachers that they exhibit aptness in Mother Tongue, Filipino and English to best support the teaching and learning process. Notably, they have to display the required skills to include, communication strategies, teaching strategies and technologies to elevate high-quality learning outcomes.

The second domain is "learning environment." It is emphasized that teachers have to organize learning environments that are safe, secure, fair and supportive in order to promote learner a sense of responsibility and achievement. In addition, they design an environment that is learning-focused and they efficaciously manage learner behavior in a concrete and virtual space. Likewise, they utilize a spectrum of resources and provide intellectually challenging and stimulating activities to encourage constructive classroom interactions geared towards the attainment of high standards of learning.

The third domain is "diversity of learners." The teachers are expected to substantiate learning environments that are responsive to individuality. Significantly, they respect learners' diverse characteristics and experiences as inputs to the planning and design of learning opportunities. Above all, they exercise celebrating diversity in the classroom and the need for teaching practices that are differentiated to motivate all learners to be thriving citizens in a changing local and global environment.

The fourth domain is "curriculum and planning." Teachers have the free-will to take initiative in acquainting with the national and local curriculum requirements. Importantly, they can translate curriculum content into learning activities that are meaningful to learners and based on the principles of effective teaching and learning. More so, they can apply their professional knowledge to plan and design, individually or in collaboration with colleagues, well-structured and sequenced lessons that are contextually relevant, responsive to learners' needs and incorporate a range of teaching and learning resources. Finally, communicating learning goals supports learner participation, understanding and achievement.

The fifth domain is "assessment and reporting." It is a must that the teachers apply a variety of assessment tools and strategies in monitoring, evaluating, documenting and reporting learners' needs, progress and achievement. They use assessment data in a variety of ways to inform and enhance the teaching and learning process and programs. They provide learners with the necessary feedback about learning outcomes that informs the reporting cycle and enables teachers to select, organize and use sound assessment processes.

The sixth domain is "community linkages and professional engagement." The teachers need to know how to establish school-community partnerships aimed at enriching the learning environment, as well as the community's engagement in the educative process. They identify and respond to opportunities that link teaching

and learning in the classroom to the experiences, interests and aspirations of the wider school community and other key stakeholders. They understand and fulfill their obligations in upholding professional ethics, accountability and transparency to promote professional and harmonious relationships with learners, parents, schools and the wider community.

The seventh domain is "personal growth and professional development." The teachers have to value personal growth and professional development and exhibit high personal regard for the profession by maintaining qualities that uphold the dignity of teaching such as caring attitude, respect and integrity. Significantly, value personal and professional reflection and learning to improve their practice. Notably, assume responsibility for personal growth and professional development for lifelong learning.

Above all, the seven domains serve as a guide for the teachers to possess the characteristics of a quality teacher in the Philippines with consideration of the 21st century learning.

Preparation Practices of the Teacher Education Institutions to ECE Pre-service Teachers

Teacher preparation contributes to the success of producing quality graduates in the field of teacher education. Definitely, these prospective teachers need to have sufficient trainings in the Teacher Education Institutions (TEIs). Indeed, the tainings to be provided have to be taken seriously. Since these will determine if the pre-service teachers have the right skills to be highly effective to teach young children. Alternatively, TEIs have different priorities as to what domains they entail their students to develop. However, there are common standards that the TEIs around the world share the same beliefs and principles.

In the Philippines, there is only one common teacher standards that the teachers have to follow regardless of their specialization. With this in mind, the researcher included all the seven domains reflected in the PPST to grasp what are these specific trainings the BECEd students need. The domains enumerated below were from different related literature and related studies with regard to training the prospective teachers in the frame of reference of Early Childhood Education principles.

Domain 1- Content Knowledge and Pedagogy

The know-how of the pre-service teacher on the content and pedagogy has a weight in the teacher training in Teacher Education. Obviously, every TEI has different compass of program goals. Similarly, the focus diverges from program to program because of their distinct features. However, it is also important to note that although there are variations, still, there are common components that are included in most programs. As accentuated by Lewin (2004), the similitude of these components need to be given extra attention in the training of the prospective teachers because this will define quality of the trainings provided to them. To mention, the awareness of the different subjects offered in the primary curriculum, the knowledge and application of the different methods in teaching, the ways and means of assessing the learning outcomes of the children to in relation to respective subject areas, the rationalizing the capabilities of the children with regard to assessment, the sympathy of how children master skills and how their developmental domains affect learning, the acquisition of professional distinctiveness by having knowledge on the professional courses offered in the school, and lastly, the chances of applying what have been taught in the classroom during the teaching internship with the support from the cooperating teachers in the field.

Additionally, it is also important to note that skills in developmentally appropriate practice and play-based strategies need to be highlighted in the pre-service training. More importantly, the positive use of ICT and proficiency in mother tongue are encouraged to aid the learning process of the children. These aforementioned statements were supported by UNESCO and SEAMEO (2018) that, teachers need to reflect that play has an essential role in the lives of the children. Hence, it provides ample of chances for the children to learn and develop. In addition, the language understood by children is encouraged to be used by the teacher for the children to easily connect with teacher and vice versa.

The precedent statements were also claimed by UNESCOS's International Institutes for Educational Planning (n.d.) that, pre-service teachers need to have compendious knowledge on the content area. More so with the methods of teaching. Notably, it was suggested that the prospective teachers need to have ample of opportunities to engage themselves in demonstration teaching while taking those courses that involve strategies and methods

instead of the teacher in the TEIs giving lecture about pedagogy. Although it was re-emphasized in the foregoing statements about knowledge on the content and pedagogy in ECE, still, it is difficult to enculcate in the hearts and minds to some students to be child-centered. As revealed in the study of Garces and Arboleda (2017), it was found out that the students in the TEIs have given so much weigh on the disciplinary subjects rather than in holistic education. This was attested when twenty-four students were asked to answer the questionnaire with regard to learner-centered education. Thus, it is still a challenge to train the students in the TEIs.

On the lighter note, for the students to become well-prepared, as stated in National Association for the Education of Young Children (2012), they need to be often exposed to several opportunities to engage with children in order to obtain sound knowledge and understanding of young children's characteristics and needs. Notably, the foundation that covers the multiple, interrelated areas of children's development and learning are: physical, cognitive, social, emotional, language, and aesthetic domains; play, activity, and learning processes; and motivation to learn—and is supported by coherent theoretical perspectives and by current research.

Domain 2- Learning Environment

The awareness of pre-service teachers on the appropriate set-up of learning environment is stressed. In the Philippines, there is a single policy on the implementation of Kindergarten Program both in the public and private schools. Specifically, DepEd Order No. 47 or the Omnibus Policy on the Kindergarten Education enumerated the common standards in organizing the learning environment. As such, it is appropriate for the teachers in the TEIs to introduce the forenamed policy to the students for them to become familiar of the practices in actual field. Particularly, the pre-service teachers have to be aware that the learning environment of young children is inclusive for all. This includes, openness, respect, care, nurturing and safe for the holistic development of the children. More importantly, the prospective teachers have to be aware that the materials, equipment, and learning spaces are designed to encourage children for discovery and exploration. After all, children are considered as active learners. Likewise, the teachers-to-be have to understand that when organizing the classroom, it anticipates individual, small-group, and whole group activities and allow for teacher and child-initiated activities. Indeed, the children are taught to be responsible for their own learning.

In connection, teachers have a tremendous responsibility in furnishing inclusive learning environment especially those children with special needs. UNESCO and SEAMEO (2018), suggested that, teachers have to supply children with varied learning and development activities. Significantly, in all circumstances, practice inclusiveness in all areas. In terms of managing challenging behavior, as reflected in the Proficient Teacher Evidence Guide: Early Childhood Teachers by NSW Education Standards Authority (n.d.), enable to manage children with challenging behavior, it is a requisite to establish and negotiate clear expectations with children.

In addition, to create a healthy, respectful, supportive and challenging learning environments for each child, the National Association for the Education of Young Children (2012) suggested the following features in setting-up learning environment for children. To mention: first, the environments are healthy—that is, the prospective teachers need to possess knowledge and skills on promoting young children's physical and psychological health, safety, and sense of security, second, the environments reflect respect—the prospective teachers have to practice impartiality among children especially their development and learning, third, the learning environments created by prospective teachers are supportive—that is, they have in-depth understanding that the children make meaning based on their experiences through play, spontaneous activity and guided investigations, finally, the learning environments that prospective teachers create are appropriately challenging—in short, the prospective teachers have to tie in what they know about coexistent theory and research to build learning environments that provide achievable and stretching experiences for each child-including children with special abilities and children with disabilities or developmental delays.

Domain 3- Diversity of Learners

As stressed by Florian and Rouse, cited by European Agency for Development in Special Needs Education (2010), the TEIs have to prepare students to welcome children with special needs. They need to be sensible that although their course does not include Special Education, appropriate responses have to be developed by them. Furthermore, as stressed by Jordan et al., cited by European Agency for Development in Special Needs

Education (2010) that, practicum experiences will give opportunities to pre-service teachers to examine and foster their beliefs and then learn how to address the needs of diversity in the classroom.

To strengthen the acceptance of students on inclusivity, Grimes (2014) stated that inclusive education needs to be part of training the pre-service and in-service teachers. Equally important, if the TEIs practice embedded approach in promoting inclusivity, teachers are more likely to develop all encompassing values and attitudes and feel responsible for all children. Therefore, acquainting all student teachers through mandatory courses help increase the quality of education for all children.

Moreover, the Early Childhood Framework for Quality of NYC Department of Education (n.d.) emphasized that early childhood educators need to implement their understanding on engaging children in a variety of developmentally appropriate learning experiences and certify that the process of teaching is based on children's individual strengths, interest and needs. Another aspect that the pre-service teachers need to consider, as reflected in the NYC Department of Education (n.d.) is the building of trust. This can be done by creating a community in which all children, families, and staff feel welcome and included, embracing diversity in many forms – including, but not limited to: race, ethnicity, socioeconomic status, home language, country of origin, immigration status, ability, special needs, religion, gender, gender expression, sexual orientation, housing status, and cultural background and experience. Notably, Caswell (2016) cited from Young, suggested that, for the pre-service teachers to be prepared for inclusive classrooms, general educators need to take one or a few special education courses. Indeed, no matter what pre-service teachers take to prepare them for inclusive classrooms, complacency of strategies and techniques needs to be achieved.

Above all, enclosed in individual preparation program, teachers learn and acquire different methods, techniques, and skills required to work with a population of students ranging from gifted and talented, to those with moderate to severe disabilities. According to Caswell (2016) cited from California State University, no matter how trained the teacher is on inclusive education through trainings and simulations, still, it is not an assurance that the teacher is prepared as he/she enters the classroom.

Domain 4- Curriculum and Planning

Pre-service teachers need to have knowledge and understanding in terms of curriculum and planning. As emphasized in CHED Memorandum Order No. 76, s. 2017, part of the training of the TEIs in BECEd Program is the ability of the students to design, implement, and evaluate a developmentally appropriate Early Childhood curriculum in different contexts and apply child development concepts and principles to appropriately respond to the needs of diverse learners. As inferred by Bhawan, Wing & Marg (2006), with continuous contact of pre-service teachers with children in the field through internship would help them choose, design, organize and conduct meaningful classroom activities, critically reflect upon their own practices through observations, record keeping, and analysis and develop strategies for evaluating children's learning for feedback into curriculum and pedagogic practice.

Domain 5- Assessment and Reporting

Knowledge on assessment and reporting is a pre-requisite of becoming an Early Childhood Educator. According to Delosa and Morales (2015), assessment is a vital skill that pre-service teachers need to work out to ensure the quality of teaching and learning is not jeopardized. Indeed, they affirmed that the TEIs are the best venue where skill is developed.

Furthermore, the pre-service teachers have to be familiar with the conduct of assessment especially the one stipulated in DepEd Order No. 47, s. 2016. As indicated in this DepEd Order, the intent of assessment is to assist teachers to understand individual strengths and weaknesses, and enable them to design appropriate learning activities to cater to the needs of individual learners. Besides, assessment leads to identification of possible learning difficulties or disabilities that may require further evaluation, and/or plans for early interventions. It is important to note that teachers have to refer to the expected competencies corresponding to the age of the children to appropriately assess children's progress, behavior and attitudes.

Domain 6- Community Engagement and Professional Linkages

As reflected in the National Association for the Education of Young Children (2009), students prepared for early childhood degree programs need to understand that successful early childhood education depends upon partnerships with children's families and communities. Moreover, they have to learn to value the complex characteristics of children's families and communities. Significantly, they use their understanding to create respectful, reciprocal relationships that support and empower families and to involve all families in their children's development and learning.

Furthermore, engaging the community and having professional linkages contribute to the success of the ECE program. According to UNESCO and SEAMEO (2018), one example of this is by contextualizing the teaching-learning process by inviting them as facilitators wherein they can take part in sessions as appropriate and agreed upon with the community. With this in mind, pre-service teachers need to be educated on how to build relationships with these relevant people, namely, parents, guardians and the community. As said by Evans (2013) cited from Coffey (2010), there were several studies conducted that show how pre-service teachers were better able to incorporate community knowledge into their instruction. To mention, their participation in various family engagement activities as required by Higher Education course work.

Green (2016) cited from Horn & Campbell (2015) found that many pre-service teachers were satisfied when they were asked to be assigned in the community as part of their coursework. According to the student teachers, the opportunity to work with a realm of community citizens, exposed them to "different insights, opinions and viewpoints". Indeed, as evidenced of their adoption of several lesson ideas into their placement practicum and units of work, a new understanding of the availability of resources and expertise in the wider community, and exposure to different teaching styles and ideas were gathered. Hence, the assurance to incorporate new learning ideas into teaching practice addresses the significance of how exposure in the field served as a concrete ground from which they could take risk in envisioning new likelihood.

Domain 7- Personal Growth and Professional Development

The main reason why professional development is continuous for a reason that the teacher preparation programs have not sufficiently train the pre-service teachers for all conditions. According to Shady, et al. (2013) cited by Caswell (2016), professional development workshops positively impact teacher' abilities to teach students with specific learning disorders," which mean even if a teacher did not learn about a specific topic in school, there is still an opportunity to learn. Although professional development may not always be offered, it is provided as a supplement to improve teacher quality.

It is important to consider that the skills that pre-service teachers need to be aware of in terms of professional development are as follows: a) know and use ethical guidelines and other professional standards related to early childhood practice, b) knowledgeable, reflective, and critical perspectives on their work, making informed decisions that integrate knowledge from a variety of sources, and c) informed advocates for sound educational practices and policies (National Association for the Education of Young Children, 2009). As suggested by Malm (2009), the teacher education needs to heighten the awareness of students of what it means to be a teacher, both the personal "being" and the professional "becoming" as indispensable and correlated dimensions of career development. She added that, teacher education needs to focus much more on the personal processes involved in becoming a professional teacher, that is, teacher training program should comprise a well-grounded balance between the cognitive and emotional dimensions to teach. Hence, UNESCO and SEAMEO (2018) pointed out that, the central point of professional development depends on the commitment to proactive and continuous lifelong learning and personal mastery.

In summary, when defining teacher quality framework for early childhood educators, it is necessary to look into the alignment of Teacher Education Curricular Program to the standards set for early childhood educators to consistently practice them in early childhood settings. By clearly delineating the expected competencies and skills for early childhood educators, they will become knowledgeable and aware of their roles and responsibilities in educating the very young children. As what Gallie and Keevy (2014) said, teachers being skilled in their academic and professional knowledge and having the ability to impart that knowledge in an ethical, appropriate and engaging manner is what professional standards are all about.

Method

Material and Methods

The main instrument used in this study was the "Beginning Teachers Indicators (BTIs) in the PPST". This involved 37 strands/indicators dispersed in the seven domains as stipulated in the PPST. The strands/indicators have increasing levels in terms of knowledge, practice and professional engagement. In particular, the eight respondents involved in the study are experts in ECE, certainly, were commissioned to unpack the PPST. They are from Davao City, Digos City and Cebu City, Philippines. The underpinning of the selected respondents in the study was done via purposive sampling. Significantly, as what mentioned in Research Methodology (2018), purposive sampling could be made use of by the researcher when only individual judgement was applied in order to choose cases that facilitate in actualizing the research objectives of the inquiry. The point of reference in selecting the respondents were as followed: first, at least have three years length of experience in ECE field, and second, have first-hand experience in the ECE area. The involvement of the respondents followed the institutional Ethics Committee guidelines and had been approved. They voluntarily submit themselves as respondents of the study and agreed by affixing their signature in the informed consent given by the researcher.

The first method in this study was the unpacking of BTIs by means of translating the strands/indicators to descriptors applicable in ECE settings. In this case, the respondents provided statements that would capture the meaning of the strand/indicator as applicable to ECE settings. The second method utilized content analysis. As explained by Mayring (2000), content analysis may be utilized when the researcher has to analyze the texts. The researcher made sure that the approach in treating the conveyed information was objective and methodologically controlled within the bounds of context. In particular, the data collated during the unpacking of standards were content analyzed in order to arrive at coded meanings and themes. These were the onset in designing teacher quality framework for ECE pre-service teachers.

Results and Discussion

Unpacking of Philippine Professional Standards for Teachers (PPST): On Beginning Teachers Indicators

The unpacking of PPST Beginning Teachers Indicators was the first phase of the study. In this part, the Beginning Teachers Indicators (BTIs) that were not applicable for ECE settings were unpacked in order to identify skills that Early Childhood Educators need to possess. Then, the indicators were translated to be applicable for ECE settings.

As agreed by the respondents, the final indicators were patterned with the common standards. The translated indicators were only improved to incorporate the suggested skills per indicator by the respondents. For confirmatory validation, the researcher presented the draft of the output to the respondents. In the first validation, the respondents suggested some more indicators that needed to be included. In addition, they provided the statements and made some corrections in the draft. Then, in the second validation, the researcher let the participants checked the final output. At this point, no more suggestions made from the respondents.

Accordingly, a teacher quality framework for ECE Pre-service Teachers was determined. The output of the unpacking of standards was "Performance Indicators Guide for ECE Pre-service Teachers."

Domain 1- Content, Knowledge and Pedagogy

In Domain 1, there are seven indicators specified, to wit:

1. Demonstrate content knowledge and its application within and/or across curriculum teaching areas,
2. Demonstrate an understanding of research-based knowledge and principles of teaching and learning,
3. Show skills on the positive use of ICT to facilitate the teaching and learning process,
4. Demonstrate knowledge of teaching strategies that promote literacy and numeracy skills,
5. Apply teaching strategies that develop critical and creative thinking, and/or higher order thinking skills,
6. Use Mother Tongue, Filipino and English to facilitate teaching and learning, and

7. Demonstrate understanding of the range of verbal and non-verbal classroom communication strategies that support learner understanding, participation, engagement and achievement.

In the identification of indicators to be unpacked by the respondents, it was decided that Indicators 1, 2, 3, 4, 5, and 6 were only included. Indicator 7 was not counted in because they believed it is already fitted in ECE settings. Figure 1 showed the unpacking for Indicator 1 of Domain 1 - Content Knowledge and Pedagogy.

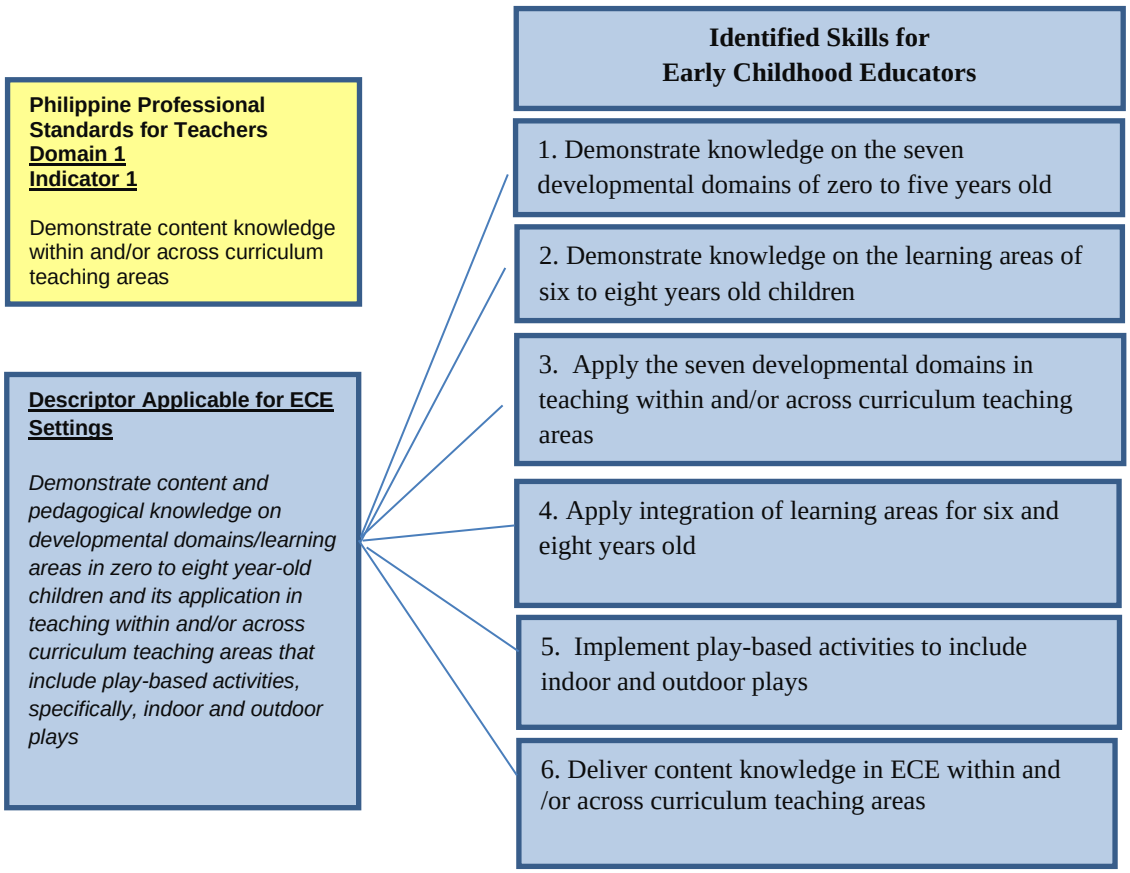

Figure 1. Unpacked Indicator 1 of Domain 1

Based on Figure 1, it was determined that six skills were provided by the respondents that Early Childhood Educators needed to possess in terms of content knowledge and its application within and/or across curriculum teaching areas. To mention,

1. Demonstrate knowledge on the seven developmental domains of zero to five years old children,
2. Demonstrate knowledge on the learning areas of six to eight years old children,
3. Apply the seven developmental domains in teaching within and/or across curriculum teaching areas,
4. Apply integration of learning areas for six to eight years old,
5. Implement play-based activities to include indoor and outdoor plays, and
6. Deliver content knowledge in ECE within and /or across curriculum teaching areas.

As specified by respondent PA, she said that, it is important to include the seven developmental domains, namely: a) socio-emotional development, b) values development, c) physical and motor development, d) aesthetic/creative development, e) mathematics, f) understanding of the physical and natural environment, and g) language, literacy and communication in zero to five year-old children.

Additionally, respondent PD suggested during the review of the draft of the output that, it is important to include content knowledge on implementing play-based activities to include indoor and outdoor plays. She suggested that the translated indicator would be "demonstrate content and pedagogical knowledge on developmental domains/learning areas for zero to eight year-old children and its application in teaching within and/or across curriculum teaching areas that include play-based activities, specifically, indoor and outdoor plays". Figure 2 is

the result of the unpacking for Indicator 2 - demonstrate an understanding of research-based knowledge and principles of teaching and learning.

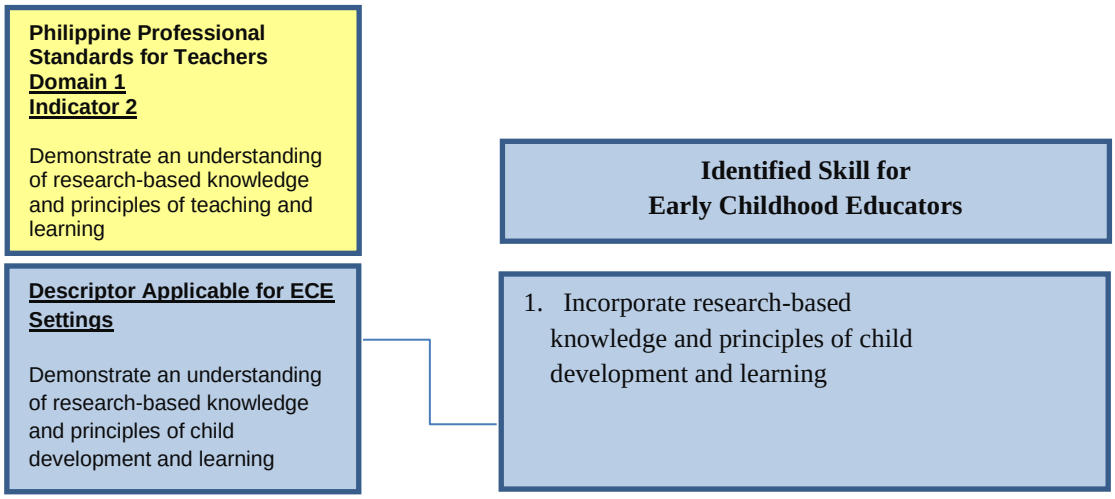

Figure 2. Unpacked Indicator 2 of Domain 1

As shown in the Figure 2, only one skill was identified by the respondents, particularly, respondent PE, she said that:

> "As an ECE teacher, it's a must that students know about researches and principles on child development and learning. When looking at the courses in ECE, you observed that there are subjects about these both in the Foundation and the Specialization courses".

It was suggested that the skill for Early Childhood Educators would be "incorporate research-based knowledge and principles of child development and learning". The translated indicator provided by the respondents was "demonstrate an understanding of research-based knowledge and principles of child development and learning". Figure 3 presents the unpacking for Indicator 3 of Domain 1.

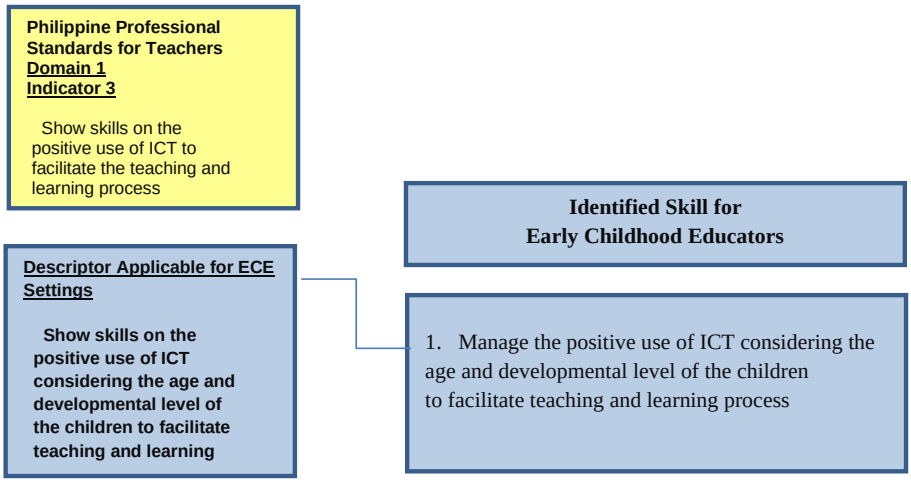

Figure 3. Unpacked Indicator 3 of Domain 1

The Indicator 3 was not included during the unpacking of standards with the group. The skill indicated was suggested by respondent PA during the review of the draft of the output; thus, she claimed:

> *Paki indicate dha na i- consider ang age and developmental level of the children. So i- state nga "manage the positive use of ICT considering the age and developmental level of the children to facilitate teaching and learning process".* (Please indicate there that age and developmental level of the children should be considered. So, state that "manage the positive use of ICT considering the age and developmental level of the children to facilitate teaching and learning process".)

The same observation with respondent PH that age need to be considered because the use of ICT is different from younger and older children. The indicator applicable for ECE settings is "show skills on the positive use of ICT considering the age and developmental level of the children to facilitate teaching and learning process". Figure 4 presents the unpacking of Indicator 4.

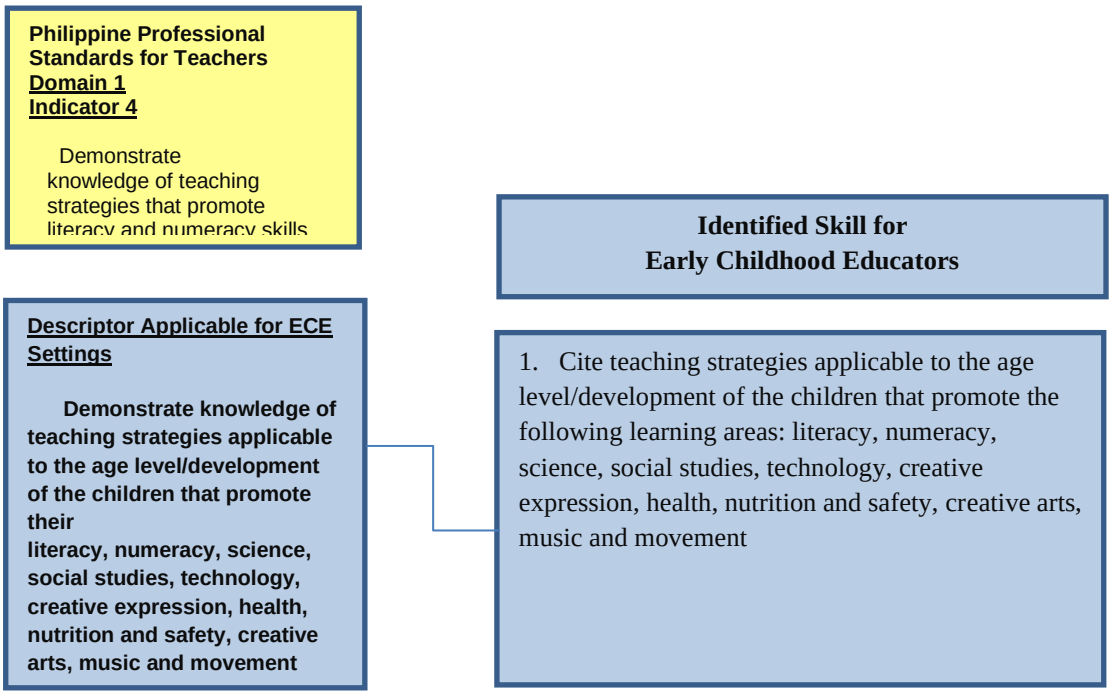

Figure 4. Unpacked Indicator 4 of Domain 1

Figure 4 shows the result of the unpacking in Indicator 4 of Domain 1. As seen on the figure, only one skill is indicated. Respondent PG explained why she included the learning areas specified in the skill. According to her:

> *"we should not limit on literacy and numeracy only, since in the different subjects, especially in the specialization courses, naay science, social studies, technology, creative expression, health, nutrition and safety, creative arts, music and movement, dapat iapil siya, after all, gitudlo man sad ni siya sa mga studyante, dba?"* (we should not limit on literacy and numeracy only, since in the different subjects, especially in the specialization courses, there are science, social studies, technology, creative expression, health, nutrition and safety, creative arts, music and movement, they should be included, after all, they are taught to students, right?)

It was suggested that the skill could be stated as "cite teaching strategies applicable to the age level/development of the children that promote the following learning areas: literacy, numeracy, science, social studies, technology, creative expression, health, nutrition and safety, creative arts, music and movement".

However, this was simplified in the final descriptor to: "demonstrate knowledge of teaching strategies applicable to the age level/development of the children that promote their literacy, numeracy, science, social studies, technology, creative expression, health, nutrition and safety, creative arts, music and movement skills". Figure 5 shows the unpacking of Indicator 5 of Domain 1.

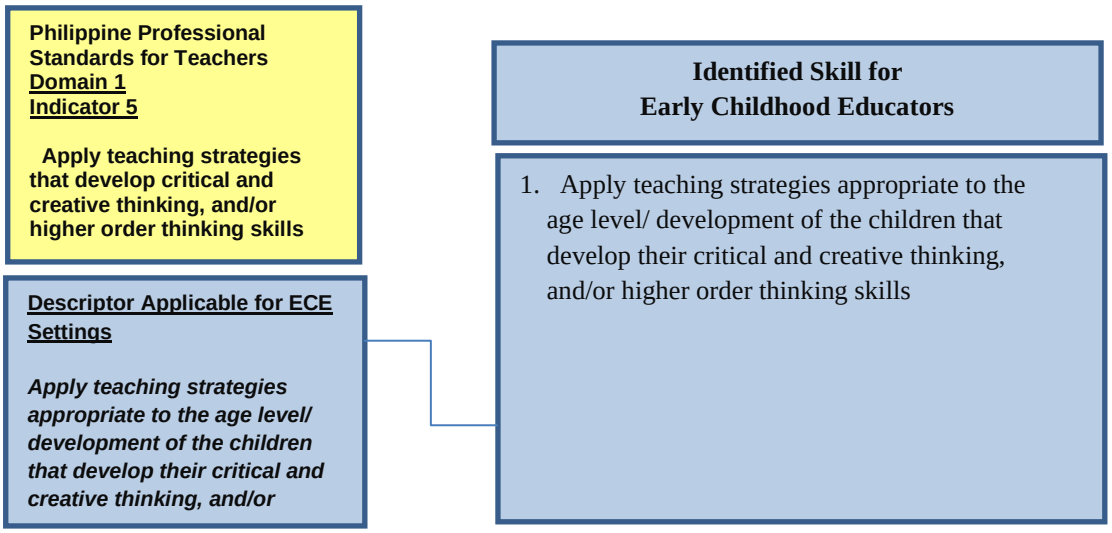

Figure 5. Unpacked Indicator 5 of Domain 1

Indicator 5 was not included in the unpacking during panel discussion. This was only suggested by respondent PG during the review of the draft of the output. She included only "appropriate to the age level/development of the children", and the rest was the same.

The translated indicator applicable for ECE settings is "apply teaching strategies appropriate to the age level/ development of the children that develop their critical and creative thinking, and/or higher order thinking skills". Figure 6 presents the result of the unpacking of Indicator 6 of Domain 1.

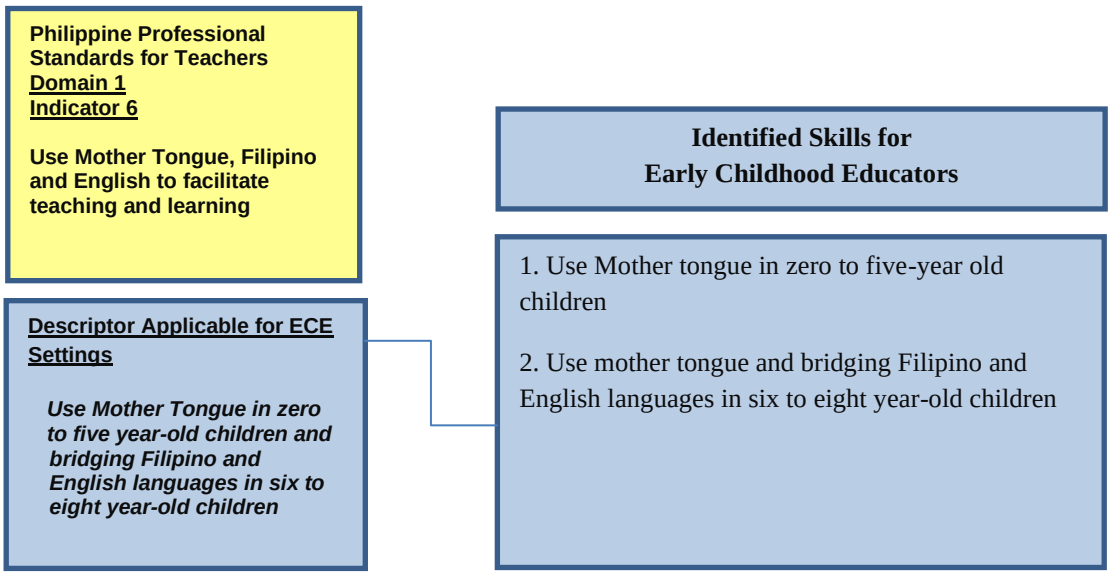

Figure 6. Unpacked Indicator 6 of Domain 1

The unpacking of Indicator 6 revealed two skills, namely: a) use Mother Tongue in zero to five-year old children and b) use Mother Tongue and bridging Filipino and English languages in six to eight year-old children. The need to separate these was explained by respondent PA, she said that:

> *"I think there's a need to separate this, dapat, use mother tongue sa five-year old children, tapos use mother tongue, and bridging Filipino and English languages in six to eight year-old".* (I think there's a

need to separate this, it should be, use of mother tongue for five year-old children, then use of mother tongue, and bridging Filipino and English languages to six to eight year-old.)

On the contrary, respondent PC argued that there was a need to consider those private schools that their mother tongue is not in Binisayang Pinulungan.

The respondents made a consensus that these have to be separated since "Mother Tongue" is used in public schools under Department of Education. The final descriptor in this domain is "Use Mother Tongue in zero to five year-old children and bridging Filipino and English languages in six to eight year-old children".

Domain 2- Learning Environment

In Domain 2, there are six indicators, namely:

1. Demonstrate knowledge of policies, guidelines and procedures that provide safe and secure environments,
2. Demonstrate an understanding of learning environments that promote fairness, respect and care to encourage learning,
3. Demonstrate knowledge of managing classroom structure that engages learners, individually or in groups, in meaningful exploration, discovery and hands-on activities within the available physical learning environments,
4. Demonstrate understanding of supportive learning environments that nurture and inspire learner participation,
5. Demonstrate knowledge of learning environments that motivate learners to work productively by assuming responsibility for their own learning, and;
6. Demonstrate knowledge of positive and non-violent discipline in the management of learner behavior.

Out of the six indicators, only three indicators (2, 4 and 6) were unpacked. The rest were retained. Presented in Figure 7 was the result of unpacking for Indicator 2 of Domain 2 - Learning Environment.

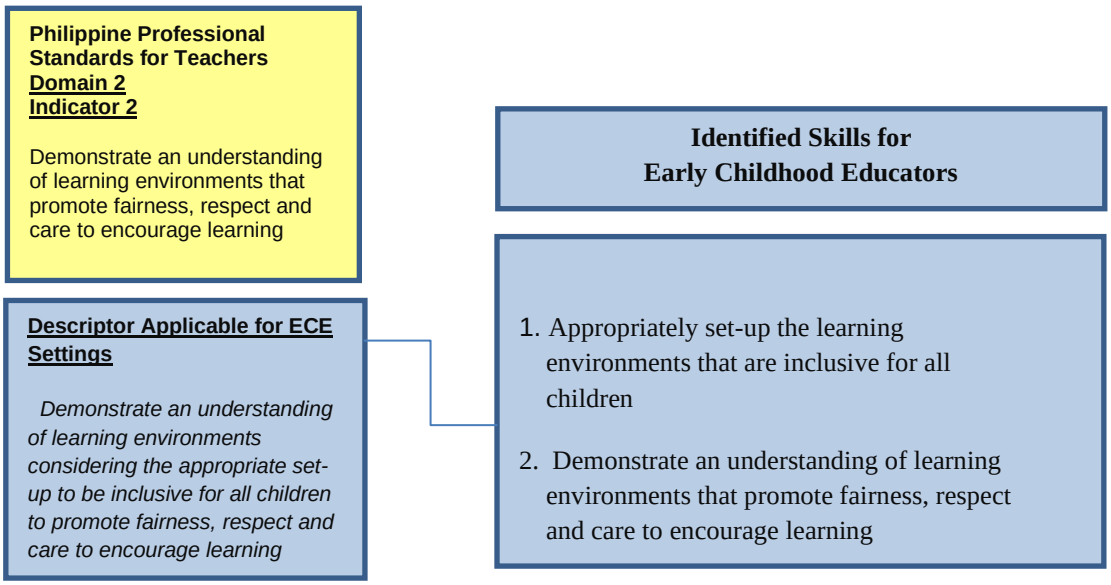

Figure 7. Unpacked Indicator 2 of Domain 2

The unpacking for Indicator 2 of Domain 2 revealed two skills that Early Childhood Educators should demonstrate. Such as:

1. Appropriately set-up the learning environments that are inclusive for all children, and;
2. Structure learning environments that promote fairness, respect and care to encourage learning.

Respondent PF pointed out the reason why there was a need to include "inclusive for all children" in Skill 1. According to her:

> *"pareho gihapon pero dungagan lng ug lain nga skill, demonstrate understanding of learning environments that are inclusive for all children, kay dapat inclusive gyud pati sa learning environment. Naa raba silay subject inclusive education sa University, mandated pud na sa ched, cmo no. 76"* (Just the same but add different skill, demonstrate understanding of learning environments that are inclusive for all children, because it should be inclusive even in "learning environment". There is subject "Inclusive Education" in the University, and it is also mandated by CHEd, CMO No. 76)

Meanwhile, respondent PG reacted that there was a need to be specific. Hence, she retorted:

> *"I believe, there is a need to be specific in here, appropriately set-up siguro, cause I think, when the teacher has demonstrated knowledge on this, s/he knows how to set up the learning environment. Pwede kaya marevise na ma'am to appropriately set-up the learning environments that are inclusive for all children?"* (I think there is a need to be specific in here, maybe appropriately set up, cause I think when the teacher has demonstrated knowledge on this, s/he knows how to set up the learning environment. Can it be revised ma'am to appropriately set-up the learning environments that are inclusive for all children?)

This was affirmed by repondent PA, according to her, DepEd Order No. 47 s. 2016 or the Omnibus Policy on Kindergarten Education needed to be instilled to the prospective teachers. It has to be considered when setting-up the classroom.

The final descriptor for Indicator 2 in Domain 2 is "demonstrate an understanding of learning environments considering the appropriate set- up to be inclusive for all children to promote fairness, respect and care to encourage learning". Presented in Figure 8 was the unpacking for Indicator 4 of Domain 2.

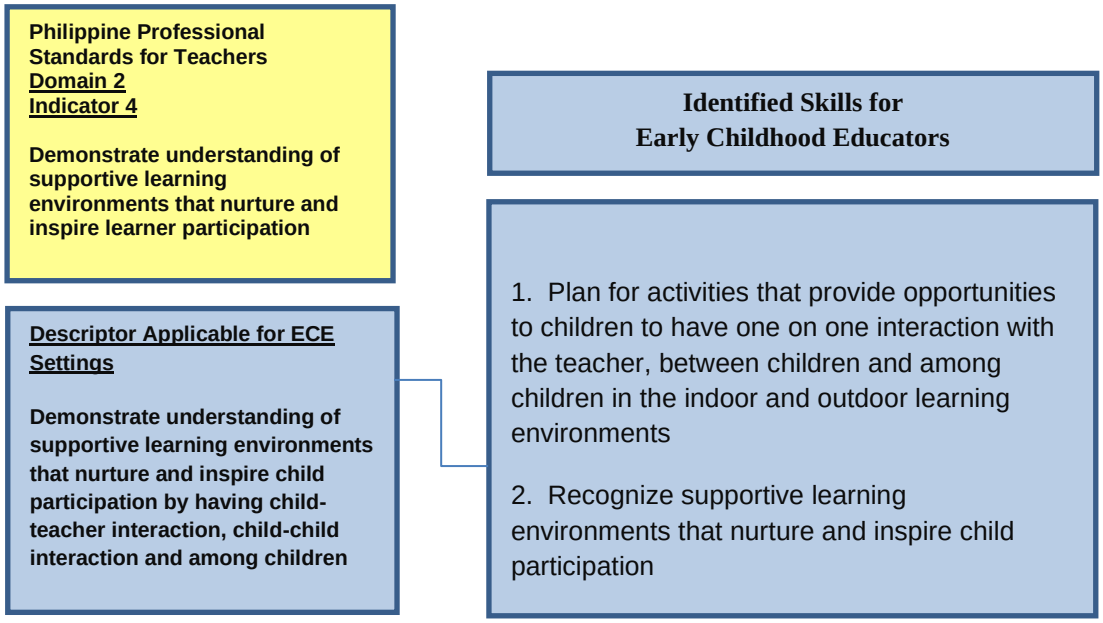

Figure 8. Unpacked Indicator 4 of Domain 2

As illustrated in Figure 8, two skills were agreed by the respondents. First, plan for activities that provide opportunities to children to have one on one interaction with the teacher, between children and among children in the indoor and outdoor learning environments. Second, recognize supportive learning environments that nurture and inspire child participation.

The suggestion was made by respondent PE. Thus, she explained:

> *"dapat maapil tong one on one interaction sa bata ug teacher, between children, and among children both indoor and outdoor learning environments."* (one on one interaction with teacher and the child, between children, and among children both indoor and outdoor learning environments)

The final indicator for Indicator 4 is "demonstrate understanding of supportive learning environments that nurture and inspire child participation by having child-teacher interaction, child-child interaction and among children". Shown in Figure 9 was the result of the unpacking for Indicator 6 of Domain 2.

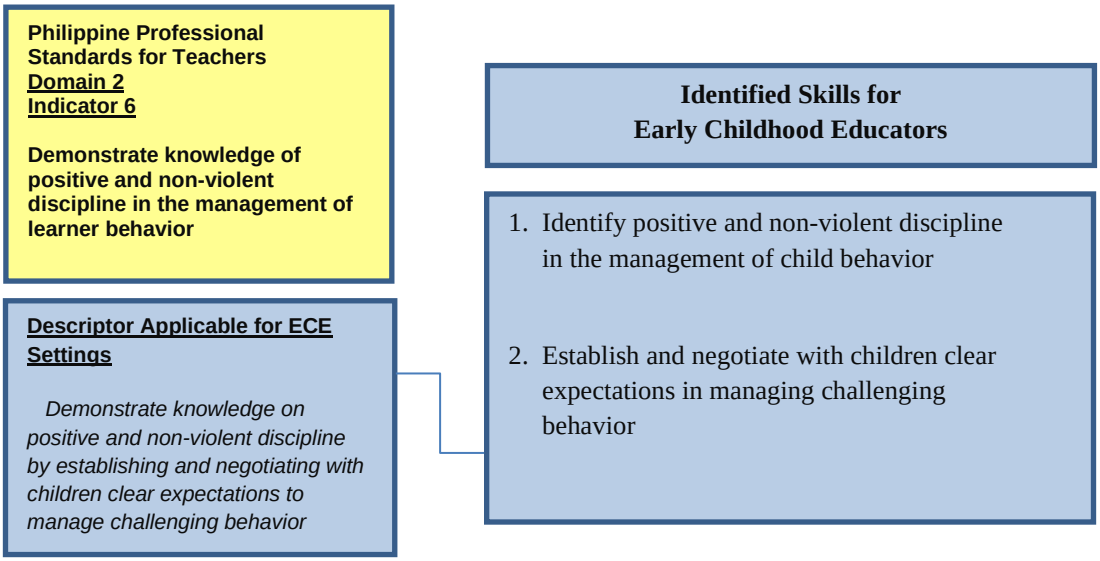

Figure 9. Unpacked Indicator 6 of Domain 2

Consequently, Indicator 6 was not included when unpacking of standards was done. One of the respondents in the TEI particularly respondent PF suggested that, it has to be specified. As such she explained:

> *"dapat naay skill na maidentify positive and non-violent discipline, then pwede maapil ang clear expectations? pwede pud xa ma state like "establish and negotiate with children clear expectations in managing challenging behavior". Naa man gud ni nga topic sa subject na Guiding Children's Behavior …"* (there should be skill on identification of positive and non-violent discipline, then can clear expectations be included? It can be stated like "establish and negotiate with children clear expectations in managing challenging behavior". It is found in the topic in subject Guiding Children's Behavior…)

Hence, the suggestions of the respondent were included. To combine the two skills, the final descriptor applicable for ECE settings was "demonstrate knowledge on positive and non-violent discipline by establishing and negotiating with children clear expectations to manage challenging behavior".

Domain 3- Diversity of Learners

Whereof, Domain 3 consisted of five indicators, namely:

1. Demonstrate knowledge and understanding of differentiated teaching to suit the learners' gender, needs, strengths, interests and experiences,
2. Implement teaching strategies that are responsive to the learners' linguistic, cultural, socio-economic and religious backgrounds,
3. Use strategies responsive to learners with disabilities, giftedness and talents,
4. Demonstrate understanding of the special educational needs of learners in difficult circumstances, including: geographic isolation, chronic illness; displacement due to armed conflict, urban settlement or disasters; child abuse and child labor practices, and;
5. Demonstrate knowledge of teaching strategies that are inclusive of learners from indigenous groups.

During the unpacking of standards, it was suggested that only Indicator 1 be unpacked.

Illustrated in Figure 10 was the result of the unpacking for Indicator 1 of Domain 3 - Diversity of Learners.

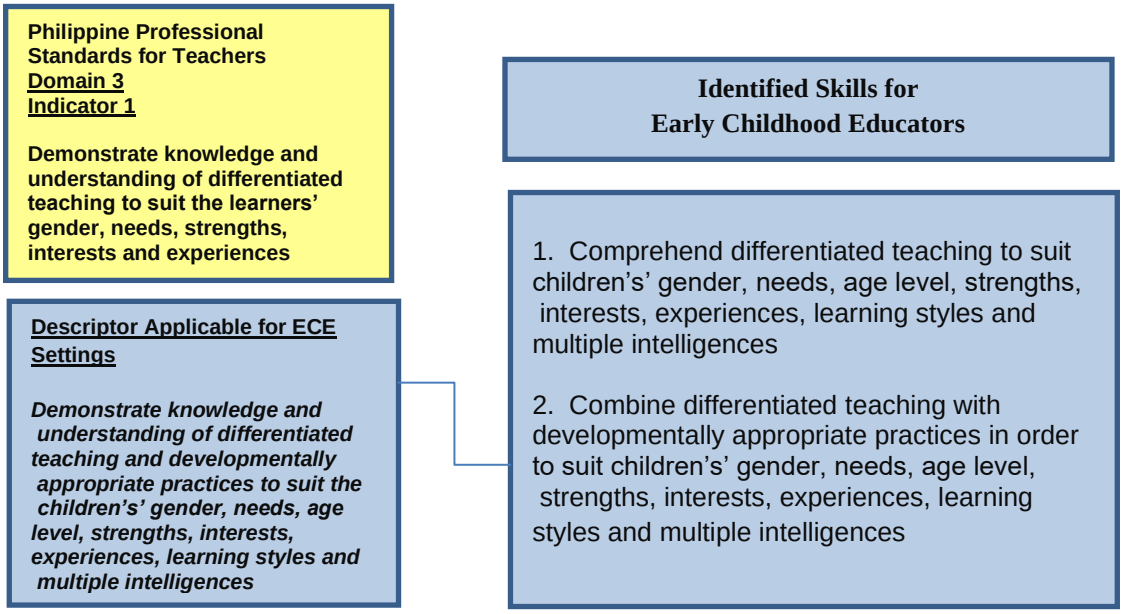

Figure 10. Unpacked Indicator 1 of Domain 3

Conversely, for Indicator 1 of Domain 3; respondent PB suggested to use the word comprehend instead of demonstrate knowledge in Skill 1. He added that, there was a need to include learning styles and multiple intelligences under this indicator. Another suggestion made by respondent PD was, "***combine differentiated teaching with developmentally appropriate practices in order to suit children's' gender, needs, age level, strengths, interests, experiences, learning styles and multiple intelligences***".
Respondent PA agreed with the suggestions made by the two participants, in fact she concurred:

> *"importante gyud na maapil mga learning modalities ug MI, dapat nakaspecify gyud na, kay para ang teacher, iya gyud na I consider when teaching. Kay lahi lahi raba ta way makalearn, dapat, klaro ni sa mga teachers."* (it is important to include learning modalities and multiple intelligences, they should be specified, so that the teacher will consider that when teaching. Because different way of learning, it should be clear to the teachers)

As suggested, the final indicator is "***demonstrate knowledge and understanding of differentiated teaching and developmentally appropriate practices to suit the children's' gender, needs, age level, strengths, interests, experiences, learning styles and multiple intelligences***".

Domain 4- Curriculum and Planning

Henceforth, there were five indicators associated to Domain 4, namely:

1. Prepare developmentally sequenced teaching and learning process to meet curriculum requirements,
2. Identify learning outcomes that are aligned with learning competencies,
3. Demonstrate knowledge in the implementation of relevant and responsive learning programs,
4. Seek advice concerning strategies that can enrich teaching practice, and;
5. Show skills in the selection, development and use of a variety of teaching and learning resources, including ICT, to address learning goals.

Concurrently, shown in Figure 11 was the result of the unpacking for Indicator 1 of Domain 4 - *Curriculum and Planning*.

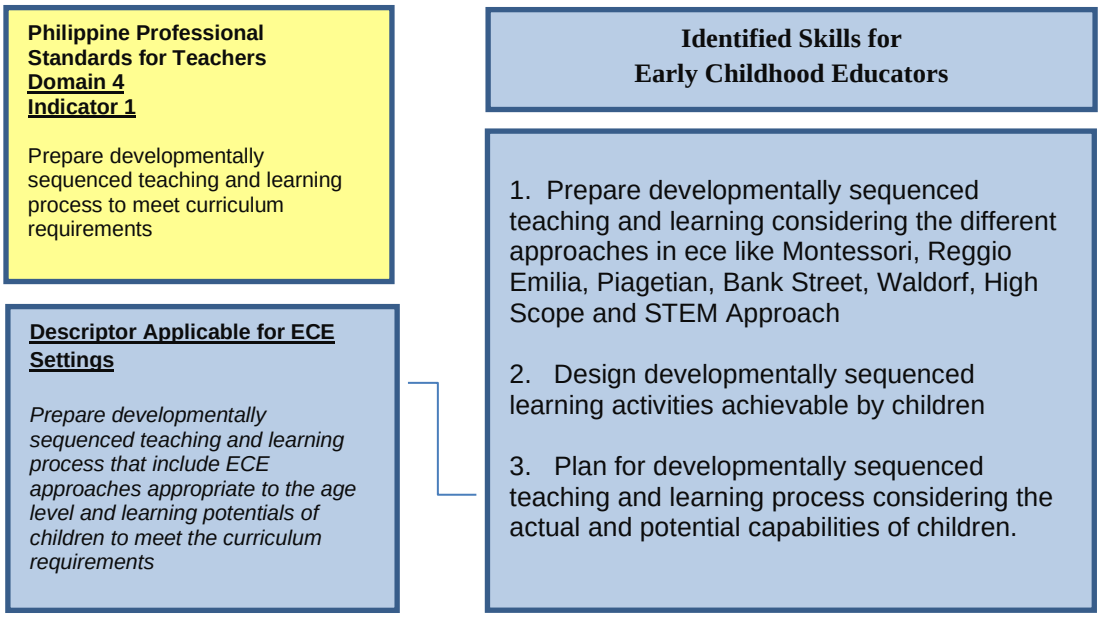

Figure 11. Unpacked Indicator 1 of Domain 4

The result of the unpacking for Indicator 1 of Domain 4 revealed three skills. Skill 1 was added by respondent PD during the review of the draft of the output, she specified that approaches in ECE needed to be mentioned. The other two skills were unpacked by the participants during panel discussion.

The second skill was suggested by respondent PB - design developmentally sequenced learning activities achievable by children. And the third skill - plan for developmentally sequenced teaching and learning process considering the actual and potential capabilities of children; was provided by respondent PF, according to her:

"Ginatudlo baya namo ni sa mga studyante. Unsaon pag-alalay sa mga bata nga naglisod." (We teach this to the students. How to scaffold to those children who have difficulty.)

Since there was a suggestion made by respondent PD, the researcher revised the final indicator during the panel discussion. This was to incorporate the suggestion of respondent PD during the review of the draft of the output. Consequently, the final descriptor was "prepare developmentally sequenced teaching and learning process that include ECE approaches appropriate to the age level and learning potentials of children to meet the curriculum requirements". Presented in Figure 12 was the result of the unpacking for Indicator 2 of Domain 4.

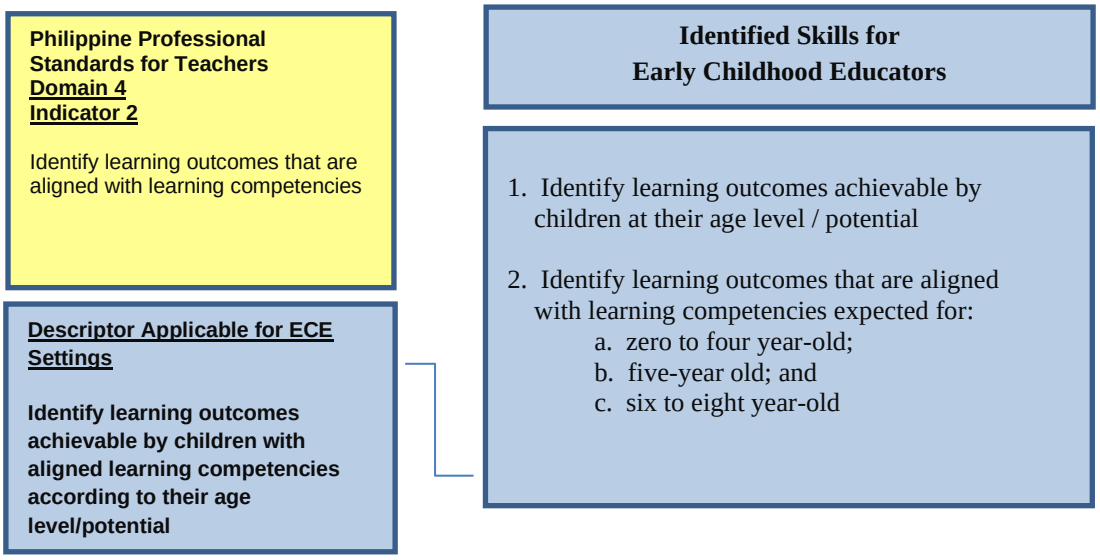

Figure 12. Unpacked Indicator 2 of Domain 4

The unpacking for Indicator 2 of Domain 4 revealed two skills. These were:

1. Identify learning outcomes achievable by children at their age level / potential, and;
2. Identify learning outcomes that are aligned with learning competencies expected for: zero to four year-old, five-year old and six to eight year-old.

As pointed out by respondent PA, there was a need to separate learning competencies for zero to four year-old, five year-old, and six to eight year-old learners. According to her, they were different.

The final descriptor for Indicator 2 of Domain 4 is "identify learning outcomes achievable by children with aligned learning competencies according to their age level". Diagrammed in Figure 13 was the unpacking for Indicator 3 of Domain 4.

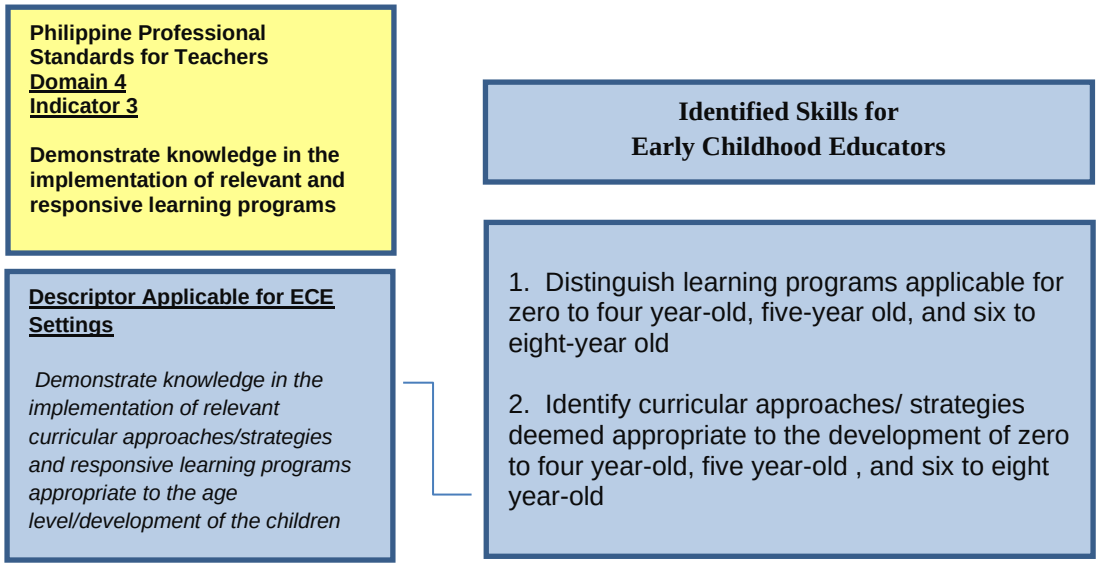

Figure 13. Unpacked Indicator 3 of Domain 4

For Indicator 3 of Domain 4, the respondents suggested two skills for Early Childhood Educators to demonstrate, these were:

1. Distinguish learning programs applicable for zero to four year-old, five-year old, and six to eight year-old, and;
2. Identify curricular approaches/ strategies deemed appropriate to the development of zero to four year-old, five year-old , and six to eight year-old.

In Skill 1, respondent PG gave her reason why there was a need to distinguish learning programs according to age. She stated that:

> *"Dapat klaro jud ang learning programs. Kay with what is happening now, na pressure na ang mga kindergarten teachers sa demand sa parents nga their children can read sentences already after they finish kindergarten."* (Learning programs should be clear. Because with what is happening now, the kindergarten teachers are pressured with the demand of the parents that their children can read sentences already after they finish kindergarten.)

This was affirmed by respondent PA, she said that:

> *"I agree ma'am, but when you check the Kindergarten Curriculum Guide, wla nagfocus sa reading, instead, developing their seven developmental domains. Dapat magfollow gyud sa blocks of time ang mga teachers."* (I agree ma'am, but when you check the Kindergarten Curriculum Guide, it doesn't focus on reading, instead, developing their seven developmental domains. The teachers should follow the blocks of time.)

The respondents agreed that the translated indicator applicable for ECE settings is "demonstrate knowledge in the implementation of relevant curricular approaches/strategies and responsive learning programs appropriate to the age level/development of the children". Conversely, Figure 14 showed the result of the unpacking for Indicator 4 of Domain 4.

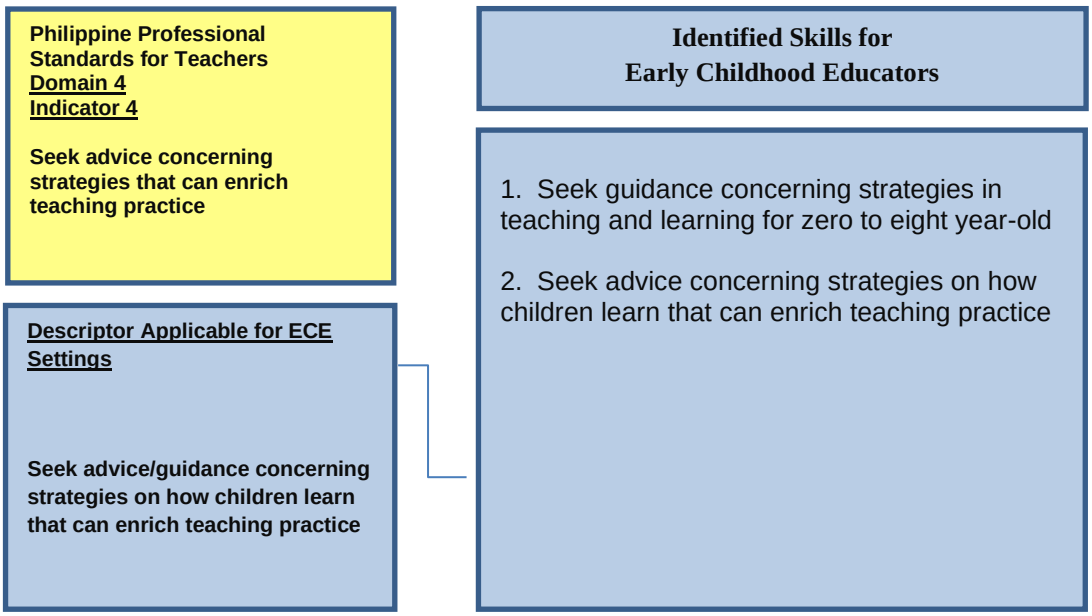

Figure 14. Unpacked Indicator 4 of Domain 4

In the unpacking for Indicator 4, it was determined that Early Childhood Teachers needed to know what were the strategies appropriate for zero to eight year-old and also how these group of children learned in the classroom. During the deliberation, two skills were provided, namely:

1. Seek guidance concerning strategies in teaching and learning for zero to eight year-old, and;
2. Seek advice concerning strategies on how children learn that can enrich teaching practice.

Respondent PE was firmed to still include seek advice, she reasoned that:

"as is lng siguro ng isa, kay mag seek advice raba ng mga teachers on what to do to improve his/her teaching in ECE. We can't deny the fact that there are those colleagues who have more experience. And as beginning teachers, they need advice especially those who are knowledgeable in ECE. If you notice, those who are assigned in kindergarten are the younger ones. And even if they are young, some of them are exposed to trainings and seminar. Although kailangan pud nila ang mga seasoned teachers nga ginatawag nato" (the other one is as is, because teachers seek advice on what to do to improve his/her teaching in ECE. We can't deny the fact that there are those colleagues who have more experience. And as beginning teachers, they need advice especially those who are knowledgeable in ECE. If you notice, those who are assigned in kindergarten are the younger ones. And even if they are young, some of them are exposed to trainings and seminar. Although they also need the seasoned teachers as what we call).

As suggested by respondent PA, to combine the two skills, the final indicator is "seek advice/guidance concerning strategies on how children learn that can enrich teaching practice". Figure 15 showed the result of the unpacking for Indicator 5 of Domain 4.

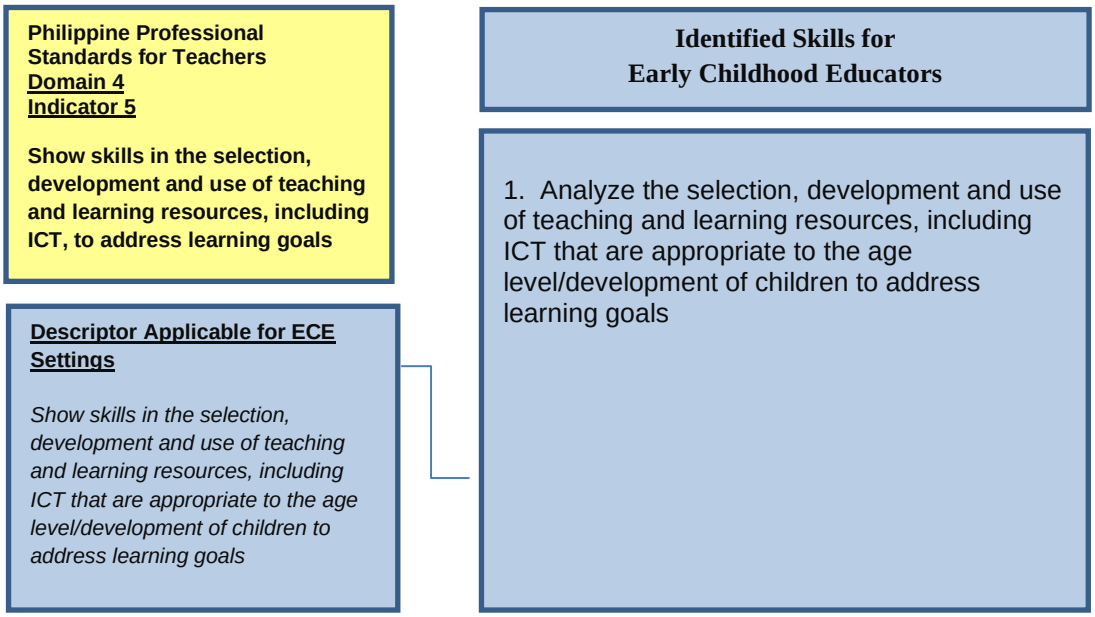

Figure 15. Unpacked Indicator 5 of Domain 4

For Indicator 5 of Domain 4, only one skill provided by the respondents. According to the respondents, in showing skills in the selection, development and use of teaching and learning resources, including ICT, the Early Childhood Educators have to know how to analyze to address learning goals.

The translated indicator is "show skills in the selection, development and use of teaching and learning resources, including ICT that are appropriate to the age level/development of children to address learning goals".

Domain 5- Assessment and Reporting

Equally important, for Domain 5, there were five indicators included. Such as:

1. Demonstrate knowledge of the design, selection, organization and use of diagnostic, formative and summative assessment strategies consistent with curriculum requirements,
2. Demonstrate knowledge of monitoring and evaluation of learner progress and achievement using learner attainment data,
3. Demonstrate knowledge of providing timely, accurate and constructive feedback to improve learner performance,
4. Demonstrate familiarity with a range of strategies for communicating learner needs, progress and achievement, and;

5. Demonstrate an understanding of the role of assessment data as feedback in teaching and learning practices and programs.

Out of five indicators, only three were unpacked by the respondents. These were Indicators 1, 2 and 4. Figure 16 showed the result of the unpacking for Indicator 1 of Domain 5.

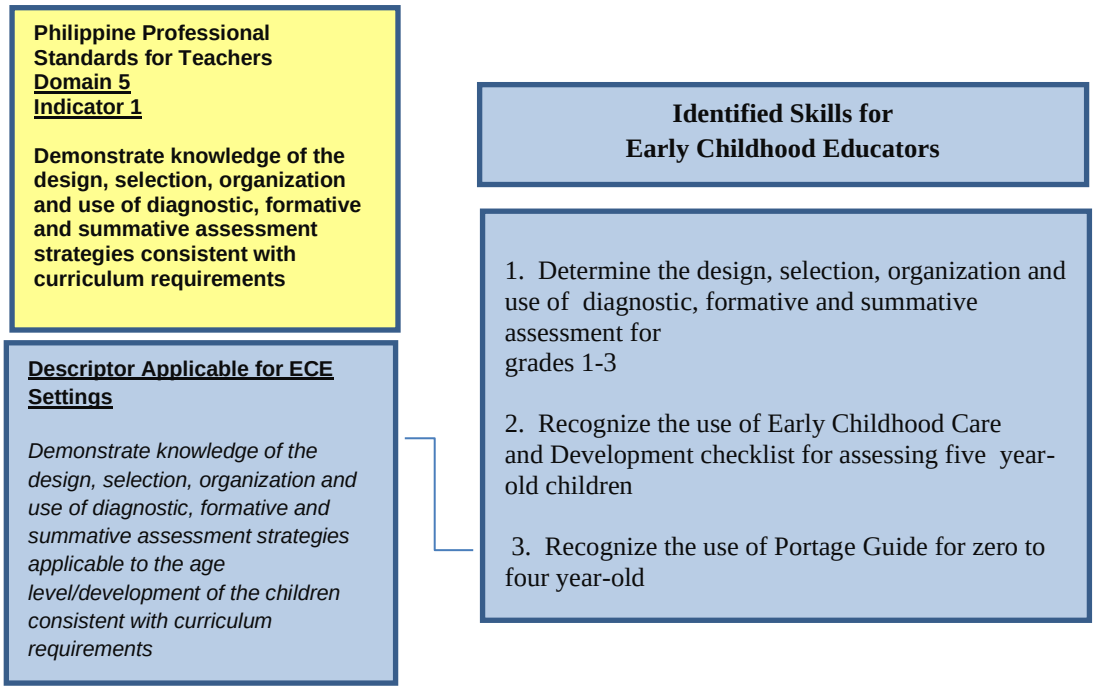

Figure 16. Unpacked Indicator 1 of Domain 5

The unpacking for Indicator 1 of Domain 5 generated three skills for Early Childhood Educators. For grades 1 to 3, respondent PA suggested that it would be "determine the design, selection, organization and use of diagnostic, formative and summative assessment for grades 1-3". In skill 2, respondent PE suggested "recognize the use of ECCD checklist for assessing five year-old children", and lastly, skill three, respondent PF suggested "recognize the use of Portage Guide for zero to four year-old".

It was agreed that the translated indicator is "demonstrate knowledge of the design, selection, organization and use of diagnostic, formative and summative assessment strategies applicable to the age level/development of the children consistent with curriculum requirements". Figure 17 presented the result of the unpacking for Indicator 2 of Domain 5.

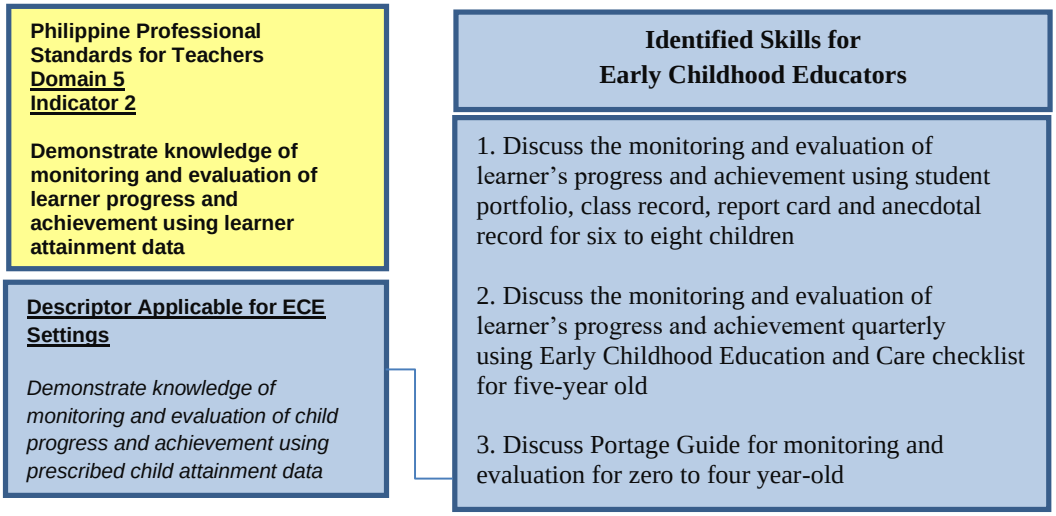

Figure 17. Unpacked Indicator 2 of Domain 5

The result of the unpacking for Indicator 2 revealed three skills. The respondents agreed that the ages needed to be categorized just like indicator 1. Included in the three skills were the following:

1. Discuss the monitoring and evaluation of learner's progress and achievement using student portfolio, class record, report card and anecdotal record for six to eight children,
2. Discuss the monitoring and evaluation of learner's progress and achievement quarterly using Early Childhood Education and Care checklist for five-year old, and
3. Discuss Portage Guide for monitoring and evaluation for zero to four year-old.

The translated indicator is "demonstrate knowledge of monitoring and evaluation of child progress and achievement using prescribed child attainment data." Shown in Figure 18 was the unpacking for Indicator 4 of Domain 5.

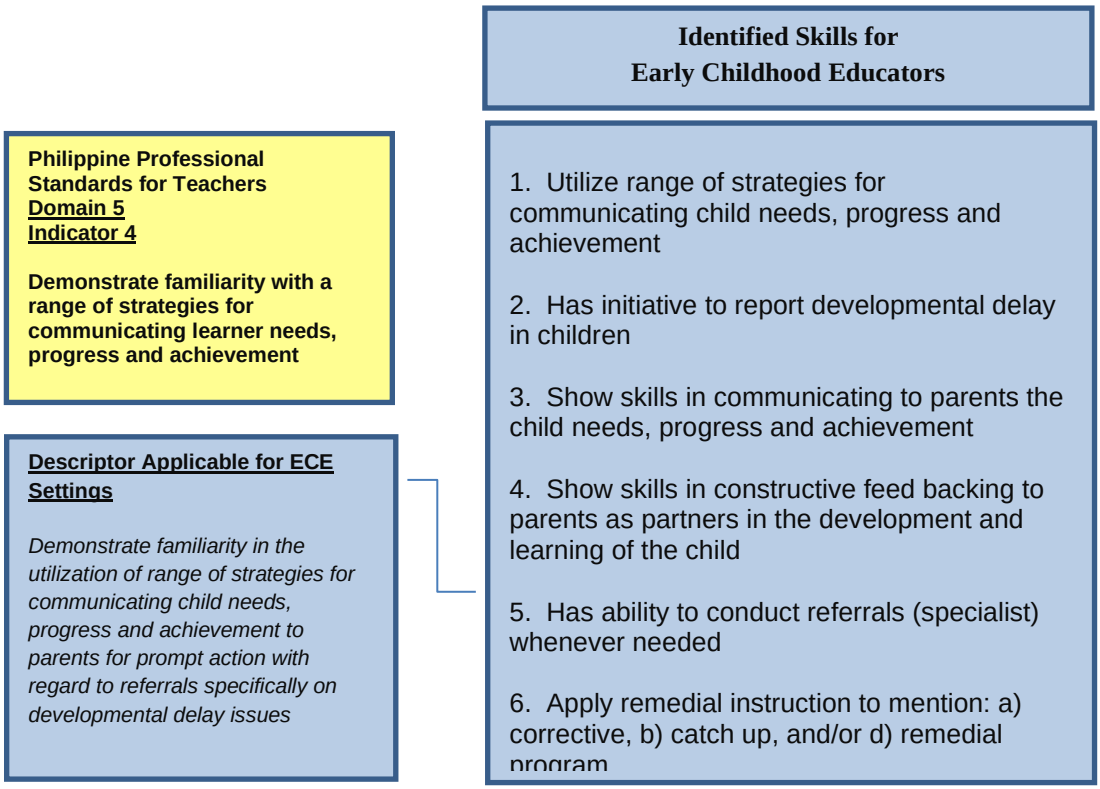

Figure 18. Unpacked Indicator 4 of domain 5

The unpacking for Indicator 4 resulted to six skills that were believed to be necessary for Early Childhood Educators. The respondents gave their suggestions with the group. Everyone were amenable with the suggestions of the other participants.

The six skills stated were the following:

1. Utilize range of strategies for communicating child needs, progress and achievement,
2. Has initiative to report developmental delay in children,
3. Show skills in communicating to parents the child needs, progress and achievement,
4. Show skills in constructive feed backing to parents as partners in the development and learning of the child,
5. Has ability to conduct referrals (specialist) whenever needed, and;
6. Apply remedial instruction to mention: corrective, catch up, and/or remedial program.

The translated indicator is “demonstrate familiarity in the utilization of range of strategies for communicating child needs, progress and achievement to parents for prompt action with regard to referrals specifically on developmental delay issues”.

Domain 6- Community Engagement and Professional Linkages

For domain 6 - Community Engagement and Professional Linkages, there were only four indicators, these include:

1. Demonstrate an understanding of knowledge of learning environments that are responsive to community contexts,
2. Seek advice concerning strategies that build relationships with parents/guardians and the wider community,
3. Demonstrate knowledge and awareness of existing laws and regulations that apply to the teaching profession, and become familiar with the responsibilities specified in the Code of Ethics of Professional Teachers, and;
4. Demonstrate an understanding of school policies and procedures to foster harmonious relationship with the wider school community.

Out of four indicators in domain 6, there were two which were unpacked, specifically, indicators 1 and 2. Figure 19 showed the result of the unpacking for Indicator 1 of Domain 6.

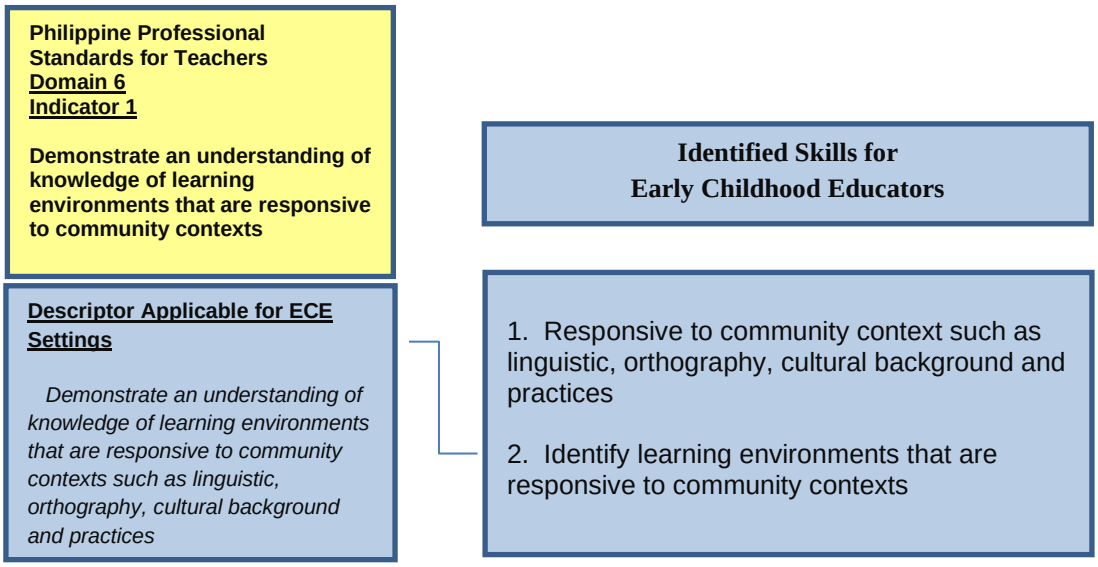

Figure 19. Unpacked Indicator 1 of Domain 6

The result of the unpacking for Indicator 1 of Domain 6 generated two skills. The first skill was suggested by respondent PA in which she mentioned that there was a need to specify the community context, such as linguistic, orthography, cultural background and practices.

Another respondent, PB suggested that skill 2 may be changed to “identify” instead of demonstrate knowledge to make it behavioural term.

The translated indicator for Indicator 1 of Domain 6 is “demonstrate an understanding of knowledge of learning environments that are responsive to community contexts such as linguistic, orthography, cultural background and practices”. Presented in Figure 20 was the result of the unpacking for Indicator 2 of Domain 6.

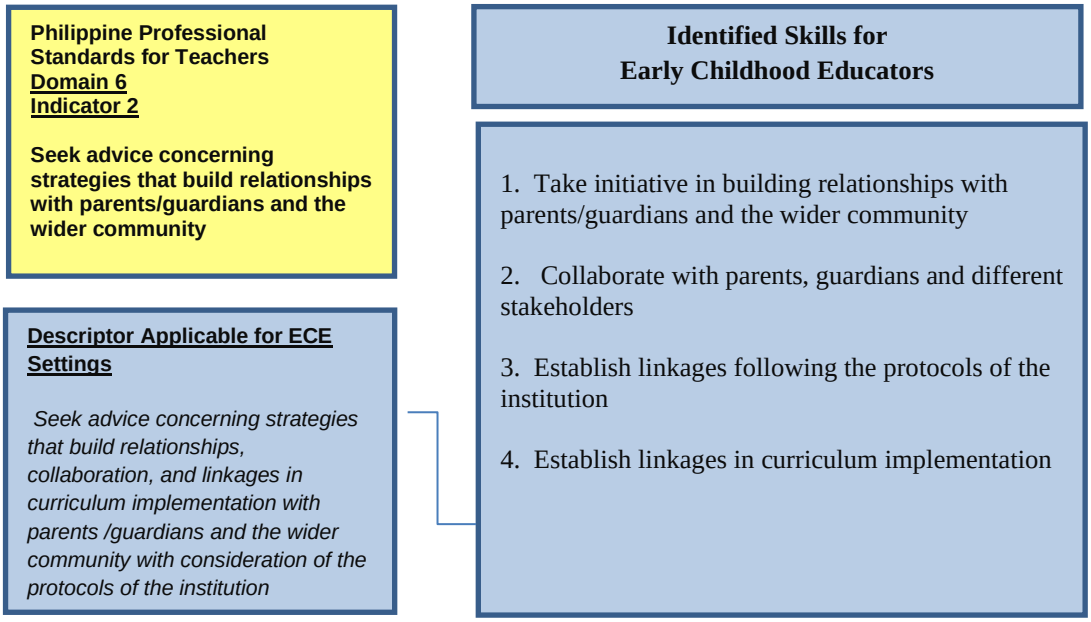

Figure 20. Unpacked Indicator 2 of Domain 6

The result of the unpacking for Indicator 2 of Domain 6 revealed four skills that ECE teachers should demonstrate. There were four respondents who contributed in capturing the common standard in indicator 2, namely:

1. Take initiative in building relationships with parents/guardians and the wider community,
2. Collaborate with parents, guardians and different stakeholders,
3. Establish linkages following the protocols of the institution, and;
4. Establish linkages in curriculum implementation.

As agreed by the respondents, the translated indicator applicable for ECE settings is "seek advice concerning strategies that build relationships, collaboration, and linkages in curriculum implementation with parents/guardians and the wider community with consideration of the protocols of the institution".

Domain 7- Personal Growth and Professional Development

For Domain 7, there were five indicators, specifically:

1. Articulate a personal philosophy of teaching that is learner-centered,
2. Demonstrate behaviors that uphold the dignity of teaching as a profession by exhibiting qualities such as caring attitude, respect and integrity,
3. Seek opportunities to establish professional links with colleagues,
4. Demonstrate an understanding of how professional reflection and learning can be used to improve practice, and;
5. Demonstrate motivation to realize professional development goals based on the Philippine Professional Standards for Teachers.

Out of five indicators, only one was unpacked, the Indicator 2. Figure 21 showed the result of the unpacking for Indicator 2 of Domain 7.

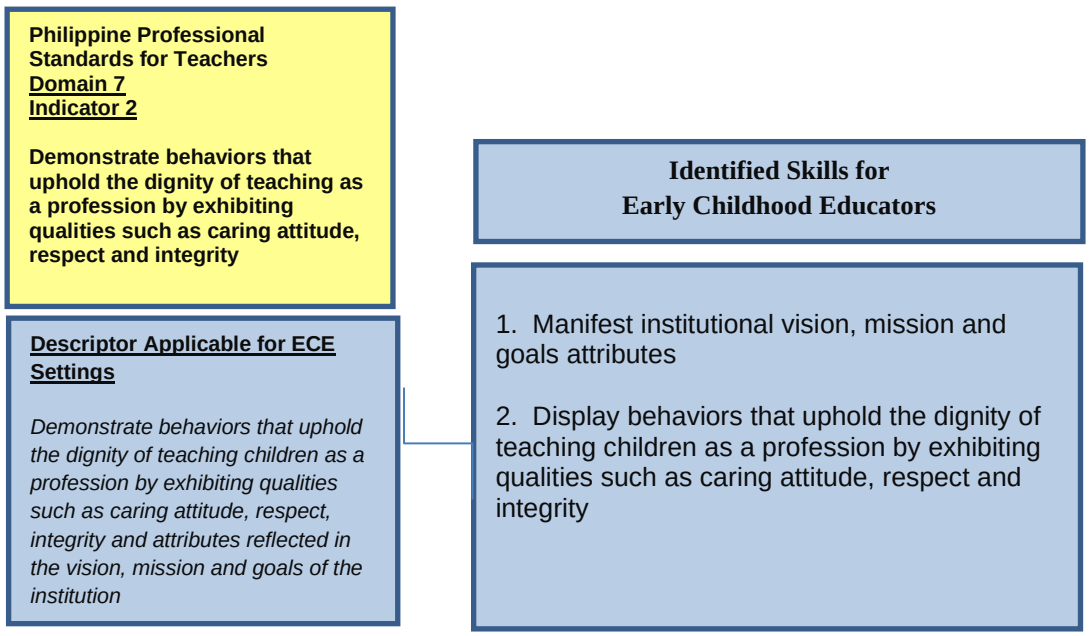

Figure 21. Unpacked Indicator 2 of Domain 7

For the unpacking of Indicator 2 of domain 7, two skills were made by the respondents. First, *manifest institutional vision, mission and goals*. Respondent PF said that it was important to consider the vision, mission and goals of the institution as attributes of the Early Childhood Teachers. According to her: *"The institution's vision, mission and goals reflect the learning outcomes of the students".*

While in the second skill, respondent PE said that there was a need to specify the common standard to: *display behaviors that uphold the dignity of teaching children as a profession by exhibiting qualities such as caring attitude, respect and integrity*.

The translated indicator applicable for ECE settings is "*demonstrate behaviors that uphold the dignity of teaching children as a profession by exhibiting qualities such as caring attitude, respect, integrity and attributes reflected in the vision, mission and goals of the institution*".

All in all, the results could mean that, as beginning early childhood educators, it is important to consider having knowledge of the developmental domains of zero to eight years old because these encompass the what, the why, the where and the how in teaching the young children. Moreover, it is important to note that ECE pre-service teachers as well as beginning early childhood educators needed to have understanding with regard to the principles of child development and learning for a reason that this will guide the teachers in terms of their planning, designing, implementing, and evaluating the curriculum.

Notably, the teachers have to possess skill such as preparing developmentally appropriate activities to be given to the children to meet the teaching-learning goals. Significantly, as early childhood educators, being familiar with different range of strategies for communicating child needs, progress and achievement are important to take in consideration especially on having knowledge taking initiative to report if there are developmental delay issues in the classroom.

More importantly, having knowledge on building relationship and collaborating with parents, co-teachers and the wider community is essential, since they could help improve the teaching-learning practices of the ECE pre-service teachers as well as beginning early childhood educators. Finally, as ECE pre-service teachers and beginning early childhood educators, being committed to work with children and their families is a source of keeping motivated to teach young children.

To encapsulate the results of the unpacking of the standards in PPST to tailor fit in the ECE context, it could be said that:

- in domain 1, the content knowledge and pedagogy, the BECEd students need to know the seven developmental domains as specificed in the Kindergarten Curriculm Guide. More importantly, apply

these developmental domains /learning areas in curriculum teaching areas. Moreover, incorporate play-based activities in indoor and outdoor plays.

- in domain 2, the learning environment, the BECEd students need to have understanding on how to appropriately set-up the learning environments that are inclusive for all children. Also, the students have to understand that planning of activities is important when teaching the children, specifically, on providing opportunities for the children and the teacher and among the children to have interactions both in the indoor and outdoor environments. However, when it comes to managing challenging behavior, the students need to have knowledge on establishing and negotiating with children clear expectations as a way of disciplining children in positive and non-violent discipline management.

- in domain 3, the diversity of learners, it is significant for the BECEd students to consider children's gender, needs, age level, strengths, interests, experiences, learning styles and multiple intelligences to suit their needs as differentiated teaching is applied.

- in Domain 4, the curriculum and planning, the BECEd students have to prepare developmentally sequenced teaching and learning processes to include the ECE approaches, in order to bring out the actual and potential skills of children. In all teaching and learning areas, the students need to consider the expected learning competencies according to the age level/development of the children.

- in domain 5, the assessment and reporting, the BECEd students need to have knowledge on the design, selection, organization and use of diagnostic, formative and summative assessments with consideration of the appropriate assessment tools. More likely, the students need to have knowledge on timely monitoring and evaluation of learner's progress and achievement. Notably, the students have to be familiar with the range of strategies in communicating with parents with regard to their child's progress and achievement, more so when there's a need for referrals when there is a developmental delay issue with the child.

- in domain 6, the community engagement and professional linkages, the BECEd students need to have understanding on how to be responsive to community context such as linguistic, orthography, cultural background and practices. Above all, the students need to seek advice in terms of strategies on building relationships and collaborating with parents/guardians. In the same way, when establishing linkages, the students need to see to it that they are following the protocols of the institution.

- And lastly, in domain 7, personal growth and professional development, the BECEd students need to manifest the institutional vision, mission and goals attributes. Significantly, the students need to display behaviors that uphold the dignity of teaching children as a profession by exhibiting qualities such as caring attitude, respect and integrity.

Teacher Quality Framework for ECE Pre-service Teachers

Teacher quality framework was the second phase of the study. At this phase, content analysis was done. This was presented through tables where the significant skills of early childhood educators that were enumerated by the respondents during the unpacking of PPST Beginning Teachers Indicators. Additionally, those indicators that were not unpacked during the unpacking of standards were taken in since there were already considered as applicable in the early childhood settings.

Meanwhile, in the coded meanings and themes, the researcher was the one who supplied the terms. The coded meanings were used to categorize the contents under "identified significant skills". While the terms found in the themes were another categorization based on the results of the coded meanings. In general, the themes were now considered as the core competencies of ECE pre-service teachers.

And lastly, the output of the study is also presented in this chapter. The expected performance indicators are briefly presented to serve as guide in attaining the indicators specified in the PPST. Explanations on how this guide may be used are provided to fully grasp its purpose.

Content Analysis of the Seven Domains

Domain 1- Content Knowledge and Pedagogy

The content analysis in Domain 1 showed the developmental domains/ learning areas covered from zero to eight year-old, the strategies and approaches in Early Childhood Education, and the pedagogy and languages used by the teacher to facilitate teaching and learning of the children in the classroom. Table 1 presented the content analysis for Domain 1 - Content Knowledge and Pedagogy.

Table 1. Content Analysis in Domain 1- Content Knowledge and Pedagogy

Identified Significant Skills	Coded Meaning	Themes
-demonstrate content knowledge in ECE -demonstrate knowledge in seven developmental domains/learning areas -demonstrate knowledge on child development and learning	- seven developmental domains/learning areas	- holistic development and learning
-apply integration in different Learning Areas -implement play-based activities -organize indoor and outdoor activities -manage the positive use of ICT according to age and developmental level -cite strategies applicable to age level -identify verbal and non-verbal classroom communication strategies -incorporate research-based knowledge and principles of child development and learning	- play-based - ICT - age/developmental strategies in the classroom - integration	- developmentally appropriate and play-based strategies in all learning areas including ICT and mother tongue
-demonstrate knowledge on different learning areas such as literacy, numeracy, science, social studies, technology, creative expression, health, nutrition and safety, creative arts, music and movement -develop critical, creative thinking, and/or higher order thinking skills	- learning areas	
-use Mother-tongue for 5 yo -bridge Mother Tongue, Filipino and English in 6-8	- facilitate teaching and Learning	

From the identified skills by the respondents, seven codes were generated, namely: a) holistic development and learning, b) play-based, c) ICT, d) age/developmental strategies in the classroom, e) integration and f) learning areas and g) facilitate teaching and learning. The result suggested that, in terms of content knowledge and pedagogy, the pre-service ECE teachers need to have knowledge and understanding about holistic development and learning of children. Equally important, the approaches need to be play-based, age appropriate and developmental to include the positive use of ICT. Also, have skills in integrating all learning areas when teaching children. More importantly, the language that needs to be used is the mother tongue of the child to facilitate in the teaching process.

When the seven codes were regrouped, two themes were generated, namely:

1. Holistic development and learning, and;
2. Developmentally appropriate and play- based strategies in all learning areas including ICT and mother tongue.

As an early childhood educator, it is necessary that there is understanding of the holistic development and learning of children. In fact, this was seen as the popular standard in ECE and was emphasized in the 2010 NAEYC Standards for Initial and Advanced Early Childhood Professional Preparation Programs by National Association for the Education of Young Children (2012) that a well-prepared early childhood degree candidates base their practice on sound knowledge and understanding of young children's characteristics and needs. This

foundation encompasses multiple, interrelated areas of children's development and learning—including physical, cognitive, social, emotional, language, and aesthetic domains; play, activity, and learning processes; and motivation to learn—and is supported by coherent theoretical perspectives and by current research.

In terms of pedagogy, it was revealed in the study that ECE pre-service teachers need to apply developmentally appropriate and play-based strategies in all learning areas including ICT and mother tongue. This affirmed by UNESCO and SEAMEO (2018) that, teachers need to realize that play has a significant role in the lives of the children. Hence, it provides ample of chances for the children to learn and develop. In addition, when communicating to children, it is expected that the teachers have proficiency in the first language used by the children to encourage participation in the classroom. And lastly, the integration of ICT in learning and programs were also highlighted in NSW Education Standards Authority (n.d.) specifically in the "Proficient Teacher Evidence Guide: Early Childhood Teachers" in Australia. It was pointed out that, when employing ICT in the classroom, the content has to be relevant and meaningful in the lives of the children.

Domain 2- Learning Environment

Under this domain are the purposeful set-up of the learning environments and the management of challenging behaviors in the classroom. Table 2 showed the result of the content analysis in Domain 2 or Learning Environment.

Table 2. Content Analysis in Domain 2- Learning Environment

Identified Significant Skills	Coded Meaning	Themes
-demonstrate knowledge on policies, guidelines and procedure -set-up safe and secure environments -demonstrate undesratnding of learning environements that promote fairness, respect and care -identify positive and non-violent discipline in the management of child behavior -establish and negotiate with children clear expectations in managing challenging behavior -show understanding on inclusive for all children -identify available physical learning environments -determine indoor and outdoor learning environments	-safe, secure and inclusive learning environment	- nurturing and inclusive learning environment
-manage classroom structure -engage learners individually or in groups, in meaningful exploration, discovery and hands on activities -nurture and inspire learner participation - recognize supportive learning environments -show knowledge on assuming responsibility for own learning -plan for activities that provide opportunities for one-on-one interaction with the teacher, between children and among children -motivate learners to work productively	- managing learning environments that encourage children's participation	- conducive learning environment for learning and development

From the identified skills of the respondents, two coded meanings were generated, specifically:

1. Safe, secure and inclusive learning environment, and;
2. Managing learning environments that encourage children's participation.

The first code which is safe, secure and inclusive learning environment focuses on knowing the policies, guidelines and procedures, creating an atmosphere of fairness, respect and care, valuing the child's socio-cultural background, practicing positive and non-violent discipline, and also setting clear expectations to children to manage challenging behavior.

The competencies mentioned above specifically on creating an atmosphere of fairness, respect and care, and also valuing the socio-cultural background of the children intertwined with the principle of inclusion of all children. As mentioned by UNESCO and SEAMEO (2018), teachers have a great responsibility in providing an environment that is inclusive for all children including those children with special needs. As suggested, children need to be provided with varied learning and development activities. Significantly, in all circumstances, the practices have to be inclusive. In terms of managing challenging behavior, as reflected in the Proficient Teacher Evidence Guide: Early Childhood Teachers by NSW Education Standards Authority (n.d.), enable to manage children with challenging behavior, it is a requisite to establish and negotiate clear expectations with children.

The second code is "managing learning environments that encourage children's participation". Notably, managing of learning environment has a momentous contribution in encouraging children to engross themselves into meaningful exploration, discovery and hands-on activities. Accordingly, physical environments need to be available both in indoor and outdoor. The aforementioned statements could be affirmed in DepEd Order 47. s. 2016 or the "Omnibus Policy on Kindergarten Education", that young children develop a certain skill when they have first hand experience through exploration with the available materials, equipment, people, and places they dwell. Indeed, the make up of the learning spaces are purposeful for the children to be engaging. Based on the result of the content analysis, two themes were revealed as core competencies for ECE pre-service teachers, first, nurturing and inclusive learning environment, second, conducive learning environment for learning and development.

The results implied that, as an early childhood educator, the structure of the learning environment is nurturing and inclusive for all children. Also, the learning environment is conducive for learning and development of children. This can be seen providing available resources, equipment and materials that give opportunity for children to engage meaningful exploration and discoveries. Likewise, give chances for children to work individually and in group. Significantly, a moment to interact with the teacher, with the other child, and among children. As emphasized in DepEd Order 47 s. 2016, the physical environment is structured where it anticipates activities that is individual, small group and whole group. Besides, an environment that permits the teacher and the children to initiate activities.

According to the National Association for the Education of Young Children (2012), prospective teachers have to demonstrate their ability to utilize developmental know-how in order to create healthy, respectful, supportive, and challenging learning environments for each child. In particular, the prospective teachers have to consider the aspects when organizing the learning environments for children. First, the learning environments need to be healthy. The prospective teachers have to be aware that the set-up of the environments help elevate the children's physical and psychological health, safety, and sense of security. Second, the environments reflect respect. To exhibit this, the prospective teachers need to be objective in the development and learning of children. Third, the learning environments built by prospective teachers are supportive. In other words, they have faith in young children's ability to gain knowledge. Moreover, they make use of their understanding on early childhood development in order to fully understand the child. As a result, the children are encouraged to grasp and reflect from their experiences through play, spontaneous activity, and guided investigations. Finally, the learning environments are organized in such a way that they are appropriately challenging. Clearly, the prospective teachers need to execute their knowledge of coexistent theory and research to set-up learning environments that provide achievable and "stretching" experiences for all children, that to include, children with special abilities and children with disabilities or developmental delays.

Domain 3- Diversity of Learners

Specified in this domain are the approaches in teaching to cater the diverse needs and interests of the children. Moreover, the diverse backgrounds of the youngsters and their families were also explored. Table 3 shows the result of the content analysis in Domain 3 or Diversity of Learners.

Table 3. Content Analysis in Domain 3- Diversity of Learners

Identified Significant Skills	Coded Meaning	Themes
- comprehend differentiated teaching - prepare developmentally appropriate learning activities	-differentiated and developmentally appropriate teaching practices	- differentiated teaching and developmentally appropriate practices

		for diverse children
- suit children's gender, needs, age level, strengths, interests, experiences, learning styles and multiples intelligences - responsive to learners' linguistic, cultural, socio-economic and religious backgrounds - responsive to learners with disabilities, giftedness and talents - determine special educational needs of children in difficult circumstances - apply teaching strategies for the indigenous groups	-respect and value individual differences	

The result of the content analysis in Domain 3 showed two codes, namely: a) differentiated and developmentally appropriate teaching practices and b) respect and value individual differences. In this domain, the approaches suggested by the respondents as reflected in the first code are differentiated instruction and developmentally appropriate practices. According to the respondents, children are different from one another, they have different interests, strengths and needs. In order to cater their uniqueness, the approaches have to be according to individual's needs. As a result, they help improve the performance and bring out the best in every child. Although children develop based on the normal development, still their pace of learning is different from one another. The classroom instruction cannot be homogeneous.

The other code identified in this domain is "respect and value individual differences". Based on the indicators, children differ in gender, needs, age level, strengths, interests, experiences, learning styles, multiple intelligences, language, culture, socio-economic, and; religion. However, there is also a need to look at those children who have disabilities, special educational needs, children in difficult circumstances and indigenous groups. In addition, those children who are considered as gifted and talented, have also different needs compared with regular children. This would mean that ECE pre-service teachers and beginning early childhood educators need to respect and value individual's differences. One theme was generated in this domain; to mention, differentiated teaching and developmentally appropriate practices for diverse children. In the Early Childhood Framework for Quality of NYC Department of Education (n.d.), engaging children in a variety of developmentally appropriate learning experiences and ensuring that the instruction is based on children's individual strengths, interest and needs are included in their framework that early childhood educators must observe.

The NYC Department of Education (n.d.) also seen of building trust by creating a community in which all children, families, and staff feel welcome and included, embracing diversity in many forms – including, but not limited to: race, ethnicity, socioeconomic status, home language, country of origin, immigration status, ability, special needs, religion, gender, gender expression, sexual orientation, housing status, and cultural background and experience. The results suggest that, to effectively teach children with diverse needs, interest and socio-economic and religion backgrounds, the teaching strategies that may be applied to a group of children are individualized and developmental in order to effectively teach them. These entail that they are valued and respected in the school and wider community.

Domain 4- Curriculum and Planning

The discussions under this domain are the different learning programs applicable to the age level/development of the children. More so, appropriate learning activities that fit the needs and interest of the children. Table 4 presents the result of the content analysis in Domain 4 or Curriculum and Planning.

Table 4. Content Analysis in Domain 4- Curriculum and Planning

Identified Significant Skills	**Coded Meaning**	**Themes**
- distinguish learning programs - identify different curricular approaches - use ICT appropriate to the age level / development of children	- learning programs	- responsive learning programs

- identify curricular approaches/strategies		
- demonstrate knowledge on developmentally teaching and learning - prepare developmentally sequenced learning activities - determine activities appropriate for the age level of the children -determine activities achievable by children - consider actual and potential capabilities of children - identify learning activities applicable for zero to eight - identify activities appropriate to the development of zero to eight - demonstrate understanding on how children learn	- developmentally appropriate practice	
- analyze the selection, development and use of teaching and learning resources	- learning resources	- addressing learning goals and outcomes
- meet curriculum requirements - align learning competencies for 0 to 8 yo - identify learning outcomes - address learning goals	- addressing learning goals and outcomes	- work collaboratively to improve teaching practice
- seek guidance concerning strategies - seek guidance concerning strategies - enrich teaching practice	- collaboration with colleagues to improve teaching practice	

In the content analysis in Domain 4, it revealed five codes, to mention: a) learning programs, b) developmentally appropriate practice, c) learning resources, d) addressing learning goals and outcomes, and e) collaboration with colleagues to improve teaching practice. The respondents shared that as early childhood educators, they can distinguish different learning programs in Early Childhood Education. Moreover, they need to have competence in preparing different curricular approaches in ECE including ICT.

When preparing activities for children especially those five year-old and below, the pre-service teachers need to consider the age, developmental level, the actual and potential skills of children. Equally important, when know how children learn, hence, it helps in the preparation of curricular approaches that are achievable by children corresponding with their age/development. The other area the teachers need to consider is the available physical resources wherein the children can explore and engage with. The learning resources need to be carefully selected, develop and implement. Indeed, they are purposeful in the teaching-learning processes of the children. The planning, development, and implementation of the planned activities all end in evaluating the learning outcomes of the children. However, it has to be noted that the expected learning outcomes need to jive with the learning goals. In addition, they are aligned with the learning competencies expected to the age level of the children.

Furthermore, to improve the teaching practices of the teachers, collaborating and working with colleagues are important practices. Teachers need support from others especially those pre-service and beginning teachers who are adjusting to their new environment. When the codes were regrouped, three themes were generated, these are: a) responsive learning programs, b) addressing learning goals and outcomes, and c) work collaboratively to improve teaching practice.

The indicators in this domain reflect the learning outcomes of Bachelor of Early Childhood Education students in CHED Memorandum Order No. 76 s. 2017, that students need to design, implement, and evaluate a

developmentally appropriate Early Childhood curriculum in different contexts and apply child development concepts and principles to appropriately respond to the needs of diverse learners. Therefore, the learning programs for children need to be responsive to their interests, strengths and needs of the children. In order to address learning goals, the expected competencies shall only be targeted to be achievable by children. Lastly, collaborating with colleagues benefit the teachers to improve their teaching practice.

Domain 5- Assessment and Reporting

The presentation of the table focused on the systematic conduct of assessment to children from zero to eight year-old. Table 5 presents the result of the content analysis in Domain 5 or Assessment and Reporting.

Table 5. Content Analysis in Domain 5- Assessment and Reporting

Identified Significant Skills	Coded Meaning	Themes
- Identify assessment tools such as: Early Childhood Care and Development Checklist , Philippine Early Childhood Development Checklist, Portage Guide for zero to four - utilize child's portfolio, class card, and anecdotal record for six to eight	- tools in assessment	-systematic use of appropriate assessment tools and methods
- determine the design, selection, organization and use of diagnostic, formative summative assessment for grades 1 to 3 - discuss the monitoring and evaluation of learners' progress and achievement - discuss the monitoring and evaluation of child's progress and achievement quarterly - discuss timely, accurate and constructive feedback	- data collection systems	
- improve learner performance - apply remedial instruction: corrective, catch-up, and remedial program - show understanding on feedback in teaching and learning practices and programs - show understanding on the role of assessment - utilize range of strategies communicating learner needs, progress and achievement -demonstrate initiative to report developmental delay in children - discuss ways of communicating to parents the child needs, progress and achievement - show skills on constructive feed backing to parents as partners in the development and learning of the child - has ability to conduct referrals whenever needed	- purpose and utilization	
	- feedback mechanisms	

In the content analysis in Domain 5, it revealed four codes, to mention: a) tools in assessment, b) data collection systems, c) purpose and utilization and d) feedback mechanisms. As shown in the indicators, the first code is, the use of appropriate tools for children is emphasized. For six years and above, it made use of portfolio, class card, and anecdotal record, for five year-old, it is Philippine Early Childhood Development Checklist and for four years and below, the use of Early Childhood Care and Development Checklist and Portage Guide. These tools are mandated by DepEd for five years and above and four years and below, the Early Childhood Care and Development Council.

The second code focuses on data collection system. The assessment to children for six to eight-year-old is done quarterly using diagnostic, formative and summative assessments. These are translated into report card. For five-year-old, there is formative assessment which is administered at the beginning of the school year while summative assessment is administered at the end of the school year. In four-year-old and below, the assessment is within 10-month period, within the second month upon entry, four months after entry and six months after entry. In order to monitor and evaluate the learners' progress and achievement, the children have to be observed regularly. It is important to note that it has to be timely, accurate and constructive feedback.

As a teacher, there has to be feedback mechanism as to how the results of the assessment be communicated to parents. There need to be range of strategies in order to deliver properly the child's needs, progress and achievement. Whenever there is a need to conduct for referral when developmental delay in children is identified, the teacher shall have the initiative and knowledge in terms of the process on how to inform parents with regard to this matter.

Only one theme was generated in the content analysis in Domain 5, that is, systematic use of appropriate assessment tools and methods. The conduct of assessment is explained in DepEd Order No. 47, s. 2016. The purpose of assessment is to assist teachers to understand individual strengths and weaknesses, and enable them to design appropriate learning activities to cater to the needs of individual learners. Assessment also leads to identification of possible learning difficulties or disabilities that may require further evaluation, and/or plans for early interventions. It is important to note that teachers need to use the curriculum standards to assess children's learning, behavior and attitudes. Thus, the results in Domain 5 suggest that pre-service teachers need to have knowledge and understanding as to the purpose of assessment and how these data be utilized in order to improve children's learning, behavior and attitude.

Domain 6- Community Engagement and Professional Linkages

Domain 6 focused on the needed competencies of the early childhood educators in engaging with the community as partners in the learning processes of the children. Moreover, practice of being a professional in the education field. Table 6 presents the content analysis in Domain 6 or Community Engagement and Professional Linkages.

Table 6. Content Analysis in Domain 6- Community Engagement and Professional Linkages

Identified Significant Skills	Coded Meaning	Themes
- foster harmonious relationship with the wider school community - take initiative in building relationships with parents/guardians and the wider community - collaborate with parents/guardians and different stakeholders - establish linkages following the protocols of the institution - establish linkages in curriculum implementation	- network and collaboration with relevant stakeholders	- network and collaboration with relevant stakeholders to improve learning programs practices
- seek advice concerning strategies that build relationship with parents/guardians and the wider community	- work collaboratively with colleagues	
- responsive to community context, linguistic, orthography, cultural background and practices -identify learning environments responsive to community contexts	- socio-cultural diversity	- respect diversity in school and wider community
- has knowledge and awareness of		- pride and commitment on

existing laws and regulations that apply to the teaching profession - familiar with Code of Ethics of Professional Teachers - familiar with school policies and procedures	- professional ethics	professional ethics

The result in the content analysis in Domain 6 revealed four themes, to mention: a) network and collaboration with relevant stakeholders, b) work collaboratively with colleagues, c) socio-cultural diversity and d) professional ethics. In network and collaboration, it is emphasized that teachers need to take initiative in building harmonious relationship with parents and the wider community since they serve as partners in implementing the different learning programs in school. Moreover, they are also considered as partners of teachers in curriculum implementation. Still, the teachers need to consider the protocol of the institution before implementing any activity in respective of partnering parents and the community.

For a teacher to successfully work with relevant stakeholders, there is also a need to work collaboratively with colleagues to gain some insights on what other strategies that help build relationship with parents and the community in order to be helped in the implementation of different planned learning programs. In addition, there is a need to be responsive to the community context, linguistic, orthography, cultural background and practices so that, they feel valued and respected. In effect, they are more willing to commit their selves to be partners in the school.

Lastly, it is important for a teacher to have professional ethics by having knowledge and awareness of existing laws and regulations that apply to the teaching profession, familiar with Code of Ethics of Professional Teachers and school policies and procedures. Three themes were included under Domain 6, to mention: a) network and collaboration with relevant stakeholders to improve learning programs practices, b) respect diversity in school and wider community and c) pride and commitment on professional ethics.

As indicated in the NAEYC Standards for Early Childhood Professional Preparation by National Association for the Education of Young Children (2009), to prepare the students, they need to understand that successful early childhood education depends upon partnerships with children's families and communities. They know about, understand, and value the importance and complex characteristics of children's families and communities. They use this understanding to create respectful, reciprocal relationships that support and empower families and to involve all families in their children's development and learning. Thus, the results suggest that partnering with parents and other relevant stakeholders are necessary in order to plan for significant activities/learning programs that help improve the teaching-learning process.

Domain 7- Personal Growth and Professional Development

Domain 7 focused on the personal reflection of the early childhood teachers and their commitment as a teacher in young children. Table 7 presents the result of the content analysis in Domain 7 or Personal Growth and Professional Development.

Table 7. Content Analysis in Domain 7- Personal Growth and Professional Development

Identified Significant Skills	**Coded Meaning**	**Themes**
- reflect personal philosophy of teaching that is learner centered - exhibit professional reflection and learning - realize professional development goals based on Philippine Professional Standards for Teachers - display behavior that uphold the dignity of teaching children as a profession - manifest institutional vision, mission and goals attributes - improve practice - exhibit qualities such as caring attitude, respect and integrity - establish professional links with colleagues	- pride and commitment of being a professional teacher of young children	- pride and commitment as early childhood educator

The content analysis in Domain 7 showed only one theme, that is, pride and commitment as a teacher in early childhood. Included in the theme are: the teacher has a personal philosophy of teaching that is learner-centered, the teacher needs to have a professional reflection and learning that is willing to improve the practice of early childhood education and the teacher display motivation to achieve professional development goals set in the PPST. Thus, as a teacher in early childhood, it is essential that at all times, uphold the dignity of teaching as a profession.

Another important thing to consider in having pride and commitment as a teacher is to manifest institutional vision, mission and goals attributes, to internalize the program outcomes of the school. The qualities such as having a caring attitude, respect and integrity has to be continuously be practiced by the teacher to serve as model in the school and wider community. To establish team work in the school community, it is necessary that there are professional linkages with colleagues in order to develop and grow together professionally. According to UNESCO and SEAMEO (2018), the central point of professional development depends on the commitment to proactive and continuous lifelong learning and personal mastery.

The prospective teachers can demonstrate the aforementioned skills by having pride and commitment in their roles as early childhood educators. By practicing professional ethical standards, professional behavior, and continuous planning, participation and reflection on the ways by which they can improve the practice of early childhood care and education. Significantly, to prepare the prospective teachers in ECE, they need to know the ethical guidelines and other professional standards related to early childhood practice. They are continuous, collaborative learners who demonstrate knowledgeable, reflective, and critical perspectives on their work, making informed decisions that integrate knowledge from a variety of sources. They are informed advocates for sound educational practices and policies (National Association for the Education of Young Children, 2009).

Figure 22 presents the teacher quality framework for ECE pre-service teachers.

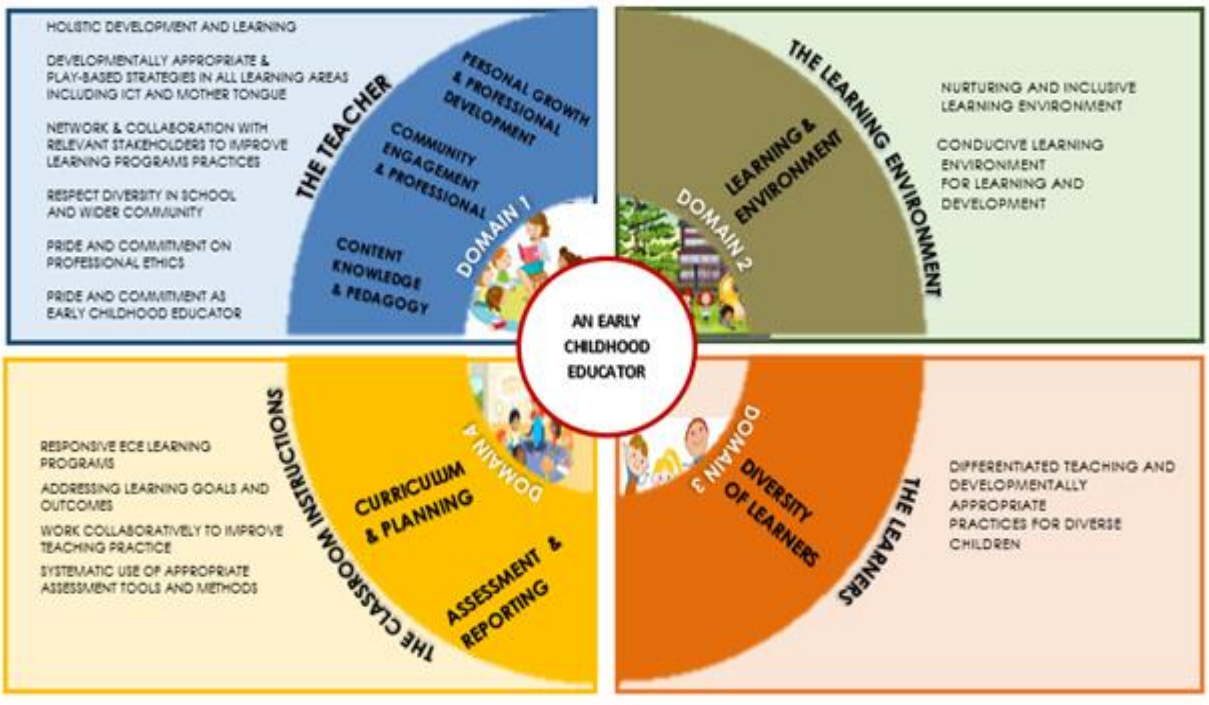

Figure 22. The Output of the Study

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Conclusion

The study revealed that the distinct competencies for Teacher Quality Framework applicable for ECE pre-service teachers were the following: a) demonstrate learnedness the content of ECE specifically the holistic development and learning of the children, b) apply teaching strategies that are developmental and play-based in all learning areas to include ICT and mother tongue to facilitate the teaching-learning of the children, c) develop skills in networking and collaboration with relevant stakeholders to improve learning programs practices, d) inculcate the value of respect in diversity in school and whole community, e) display pride and commitment on professional ethics, f) display pride and commitment as early childhood educators, g) set-up a nurturing and inclusive learning environment for children, h) design conducive environment for learning and development, i) implement differentiated and developmentally appropriate practice for diverse children, j) prepare responsive ECE learning programs, k) address learning goals and outcomes by applying systematic use of appropriate assessment tools and methods, l) able to work collaboratively to improve teaching practice and m) demonstrate understanding on systematic use of appropriate assessment tools and methods.

Recommendations

Based on the results of the study, the following were recommended:

1. The teacher quality framework specifically the Performance Indicators Guide for ECE Pre-service Teachers may be utilized by Higher Education Institutions professors to tailor the Philippine Professional Standards for Teachers as to the practical application of the Beginning Teachers Indicators in PPST of Bachelor of Early Childhood Education (BECEd) students;

2. The teacher quality framework for ECE pre-service teachers may be utilized by BECEd students likewise with beginning early childhood educators as their reference to be more consistent as to their understanding of the practical application of the teacher standards in the classroom; and

3. The school administrators may refer to the teacher quality framework particularly the Performance Indicators Guide for ECE Pre-service Teachers when evaluating their beginning early childhood educators for such guide was translated for ECE setting.

Acknowledgements

The researcher would like to thank the persons who contributed so much in the success of this study, without their enormous help and support; this study would not have been possible.

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What's the Rap? Thinking Critically about Citation Practices Given the Rise of Hip-Hop

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Abstract: Hip-hop offers opportunities to rethink citation and argument. Hip-hop's melding with digital media means that students and scholars alike must keep abreast of citation style changes and continually investigate what counts as evidence in the classroom. This involves considering the ways in which popular culture, namely hip-hop, can help students learn about notions of truth and evidence. Further, hip-hop's ready use of wordplay encourages constant critical inquiry into issues of truthfulness, authenticity, and evidence. Thus, hip-hop offers exciting opportunities to investigate citation and argument in the classroom, even though hip-hop is open to critique.

Keywords: Hip-hop, rhetoric, argumentation, evidence, composition studies

Introduction

Hip-hop demands rethinking what counts as evidence in our written and spoken communication. There are several reasons why this new way of thinking is beneficial including not only a deeper appreciation for texts and cultures, but also because the ability to weigh the relative significance of evidence and use that evidence appropriately are life skills that benefit students well beyond their time in school. Students are no longer confined to the dusty tomes and crimpled journal paper of yesteryear. The confluence of hip-hop music and digital technology means students have ever-increasing opportunities to experience, use, and ultimately cite hip-hop in their academic work. This requires scholars (and students) to improve their thinking about evidence and citation practices. This article contends that teachers, particularly those with more traditional views of learning, must rethink teaching citation practices and ideas about evidence and argumentation to account for music and music videos, and that the ways hip-hop music calls into question authenticity and originality means teachers and students must critically analyze, as they ideally would with other texts and cultural forms, what a hip-hop song purports to argue, and that as a result, hip-hop can help expand, for the better, our understanding of evidence and argumentation.

Hip-hop is not simply ascendant, but rather has ascended. Browse the latest music charts, television channel guides, or bookstore shelves and hip-hop is present. Move through the academic quad, attend a student organization fair, or wander into the nearest bar and one is likely to hear either the newest "trap" music, a sub-genre of hip-hop music popular in the U.S. South, or classics from Tupac Shakur and Notorious B.I.G. In many communities across the United States, and internationally as well, it is increasingly difficult to avoid hip-hop music let alone the other classical elements of hip-hop: break dancing, DJing, and graffiti art. Since its birth in late-1970s New York, hip-hop has helped galvanize support for social justice, blossomed into a multi-billion-dollar cultural formation, and affected areas of culture as diverse as law and fashion (Charnas, 2010; George 1998; Price, 2006, Sciullo, 2018). Like many artistic forms, hip-hop is not without its critics. Any investigation of or advocacy for hip-hop must acknowledge its misogyny, homophobia, and violence (Rose, 2008). Rather than disregard hip-hop music because of its faults, studying hip-hop can help produce a deeper understanding of culture despite its shortcomings (shortcomings that are hardly unique to hip-hop music).

Scholars are increasingly studying the impact hip-hop has on scholars and scholarship across a number of disciplines (Sciullo, 2014a; 2014b). This work emphasizes hip-hop as a teaching tool, an object of study, and a way to think about instruction (Weathersby, Jr., 2015). As such, hip-hop's role in teaching and learning is now well studied. However, hip-hop is no panacea: it will not reach all students, it will not solve all classroom instructional difficulties, and it will not avail itself to every class assignment. Yet, hip-hop may still provide important material for students in their studies, helping them to join scholarly communities and become better writers and speakers. In the same ways that other musical forms, from jazz to folk, have found their way into scholarship, so too can hip-hop be an important resources and area of study. However, the study of hip-hop raises important issues.

Sciullo, N. (2020). What's the Rap? Thinking Critically about Citation Practices Given the Rise of Hip-Hop. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 94-98), Washington, DC, USA. ISTES Organization.

Discussions of citation practices and the ways they help and hinder academic writing and argument are prevalent in many disciplines. So numerous are the citations that even wading modestly into these waters produces a significant amount of citations and little clarity. Ole Bjørn Rekdal (2014) has argued that the digital revolution has complicated citation and made it more difficult for writers to asses a source's validity. If scholars struggle with these ideas, one might imagine students are also struggling. Hip-hop, which is increasingly digital, and students who are often more digitally literate than their instructors, combine into a perfect storm that educators must address if they follow Rekdal's general claim that the digital era complicates argument and effective citation skills.

Furthermore, handbooks are not the answer as they are often poor citation guides, and teachers are pivotal in helping students appreciate why citation skills are important as well as what those citation skills indicate about writers (Rose, 1996). If handbooks are poor guides, then students might not be expected to cite sources well. Browse a selection of handbooks at the university bookstore, and one is left with little advice on choosing the best evidence even if citation practices are covered thoroughly. Rose (1996) argued that citation credibility builds community, creating disciplinary identity and can be understand as a way to help bring students together. This then positions study of hip-hop as a community-building activity that may afford students not only the time to work on citations, but also the opportunity to better know each other and their discipline. New challenges to what counts as evidence or how one cites a source demand continued investigation by students and teachers alike.

The relationship between students and teachers is particularly important in the context of citation styles (Robillard, 2006). Educators can help frame if not enable students' expression of self, helping students to discuss what matters to them and what texts and ideas are important. Expanding discussions of evidence and citation to include hip-hop can only help make students better writers and speakers even if they chose to not work with hip-hop or have interests that are neither written nor musical. Hip-hop is an access point into "a more productive, respectful, and legitimate relationship to students and their writing" (Robillard. 2006, p. 269).

Hip-hop requires a rethinking of citation practices to account for lyrics, digital dissemination, and music videos. Yet, college students are notoriously weak at citation skills (Bessette, 2013). This may be the result of a number of issues: high school teachers who focus more on content than citation, college colleagues who do the same, lack of student effort, difficulties understanding teacher expectations, confusion over citation norms, etc. The rise of computer-generated citations produces difficulties as well, as students find recourse in shortcuts instead of learning citation styles, occasionally to the disastrous result of incomprehensible strings of words and punctuation meant to be citations.

With changes in technology, teachers are tasked with informing students of new citation practices relative to those advances. They must also keep up-to-date on changes in citation practices as well as individual journal practices, which occasionally modify established citation standards. Long gone are the days of citing book and journal articles in their paper form. Increasingly, journal articles are accessed only via the Internet. Webpages are becoming popular sources of information, many scholarly in nature, and quite a few peer-reviewed. This also means that music videos, playlists, lyrics, and album art may find themselves into student assignments. The world of multimedia requires scholars to devote time to multimedia instruction in the English classroom, and no doubt beyond (Dvorghets and Shaturnaya, 2015). That hip-hop is disseminated through multimedia means students using or studying hip-hop will be confronted with changes and sometimes complex norms about how to cite musical and electronic material. Scholars must then teach citation skills that account for these texts and the world of multimedia affecting students at increasing rates.

Despite students' limited citation skills, students tend to understand that books and scholarly journal articles are citable resources. Many have been taught this for some time. Teachers, of course, recognize this. It is fairly easy to understand the formats for citing books and journal articles with minimal effort. But, students may not understand that music and music videos are in fact citable resources. This is complicated by teachers who might be skeptical of music and music videos as evidence. The author has heard everything from "music is not a text" to "English class should be only about the canon" and variants of this sort of thinking. Most scholars likely have colleagues across departments and schools who have made similar statements, even though they seem out of touch with the modern world in which our students live. Every major United States citation style (MLA, APA, Chicago) provides for music and music video citation. First year students armed with their Hacker (2012) style manual may not though receive the complex citation instruction to comfortably cite digital and aural texts. Furthermore, college students might have only written papers where teachers mandated citations that were

confined to books, journals, and newspaper articles that could be found in the high school library, for example. Therefore, teachers must help students work through citing these new resources (Vedantham and Hassen, 2011).

Working with this deficit of experience, students also often want to write and speak about issues that matter to them making desire for meaningful discussion and lack of experience in citation converge on hip-hop's role in scholarship. Teachers should not do away with the substance and style classics of English instruction, but they ought to embrace the world of multimedia around them, appreciating that doing so can help students learn. Many of today's students would not be inclined to compose work on Chaucer, World War II, Thomas Jefferson, or the tenets of classical republicanism. While those topics are fine avenues of study, there are also many new ideas, people, and texts worthy of exploring. One might reasonably argue that forcing students away from popular culture texts could inhibit their learning by discouraging them from engaging their lived experience. It might also, generally, create an inhospitable environment for learning. So, students interested in hip-hop often chose to write and speak about social justice, current events, and new texts. This ought to be encouraged in order to assure students that their voices matter, and that scholarship can pertain to their lives in explicit ways. This is to argue; hip-hop helps expand curricula to include new texts and issues that matter for students.

For their part, teachers are busy and understanding the minute differences in citation style guide updates is difficult. Furthermore, citation style guide editors often debate how to cite new and old formats in online discussions, which can make keeping up-to-date difficult. One also should be careful to fault teachers who teach what they know (citing books and academic articles, and perhaps not blogs, music videos, or poetry slams). Yet, as students become more savvy media consumers, and old models of knowledge dissemination become less helpful, all teachers must begin to engage new texts and resources. This means helping students do the same. Therefore, teachers must be critical of their citation skills knowledge as well as their own citation practices (West and Brown, 2013). This means knowing about and teaching the ways to cite songs and music videos, among other nontraditional texts. This is not meant to do away with traditional evidence, but to augment it. The English classroom can be expanded to encompass more opportunities to learn, research, and write by giving hip-hop its due.

Some may scoff at this argument, assuming all teachers of English or any other subject are not only actively teaching how to cite all sources, but as well that they readily accept music and music videos as evidence appropriate for academic writing. The picture, however, is likely more complicated. Some teachers were schooled in an era where hip-hop was not yet a part of the music scene, others may have little to no exposure to hip-hop, and yet others may hold traditional notions of what constitutes a reliable source. As a result, educators may have trouble dealing with hip-hop's oppositional tendencies (Daspit and Weaver, 2005). This problem is not unique to hip-hop, as other musical forms present similar issues. For every scholar interested in phenomenological inquiry or autoethnography, there is a scholar who never leaves the archives. For every digital humanities scholar, there is a Stanford Literature Lab-trained quantitative scholar. These differences in training, department structure, job description, and personal interest mean scholars approach texts, evidence, and argument in different ways. Recognizing one's own text and citation preferences can only help educators do a better job teaching students.

Along with questions of how teachers think about evidence and how students cite that evidence, the question of music's truthfulness remains important (Nichols, 2011). To be sure, music like other writing and speaking can both abide some notion of truth as well as readily avail itself of the flourishes of fiction. And, if educators are to teach students about citations, then they ought to teach students about weighing the validity and importance of material to be cited. If a hip-hop song is offered as evidence of a proposition, one may be called upon to assess whether this citation actually supports the claim for which it is proffered. Citations to material that is untrue, unreliable, or unimportant can call an author's ethos into question and in turn lead readers to question the veracity of an argument. Recognizing that hip-hop music may not in fact be true, in the colloquial sense, does not diminish its persuasive importance even while it may call into question what hip-hop as evidence means or how it helps an argument. Put another way, Aesop's *Fables* are not persuasive because they are true. Hip-hop then requires educators to help students think through questions of evidence and proof when using new sources in their writing and speaking.

Assessing sources' veracity is not always intuitive. While scholars may be adept at weighing the truthfulness of a source, students face more difficulty. Understanding the veracity of a source is an art honed over time and with practice. Scholars and students should ask: What is this artist's ethos? Are the artist's claims supported? What do we know from other sources about the artist's claim? Does this song ring true given other claims by this or other artists in other songs? As with every source, comparison and weighing are key. A hip-hop song or artist

deserves the same scrutiny even if one might recognize that part of hip-hop's persuasive power lies not in truth, but instead in style (Cobb, 2008). So, being able to divorce music's truth from its persuasive capacities, that is to indicate understanding hip-hop as rhetorical, can help educators and students incorporate hip-hop into their work in meaningful ways.

One might counter that even if hip-hop is persuasive or a valid source of evidence, that it might not belong in the classroom because hip-hop often has violent and misogynistic themes. Simply because hip-hop music does some good for the writer or speaker and in the classroom, opponents may argue that the music or culture has no place in school. The causal relationship between violent hip-hop lyrics and violent crime has had its supporters over the years from C. Dolores Tucker to Bill O'Reilly. For these individuals, correlation appears to apply causation, even though the correlation between hip-hop and violence is negative (Bump, 2014). To be sure, hip-hop artists also embellish, lie, exaggerate, engage in hyperbole, and carefully practice wordplay (Sciullo, 2009). This means students must consider a song's lyrics, context, and even artists' biographical details in assessing what a song might support or prove. These skills are important regardless of a student's discipline or their plans after school. Rather than dismiss hip-hop as too violent or reduce it to its worst lyrics or least exemplary artists, scholars should consider the ways hip-hop helps students understand the grammar of life. And, it is not as if many of the authors cited on a regular basis have not exhibited their own fair share of problematic practices and ideas from Martin Heidegger to Kenneth Burke to William Shakespeare.

Hip-hop helps scholars and students expand their understanding of evidence and argument, as well as encouraging students to learn more about citation practices. These skills are necessary for the rest of one's life, not only in college. Hip-hop presents new challenges given its relationship to digital media, and as a result presents ample opportunities for teaching and learning. Hip-hop is culturally relevant because is spreads across the multimediated intercultural world, and today's students have more exposure to it than ever. Because students are likely to be influenced by and interested in hip-hop, even if they do not realize this influence, educators would be well-served to teach citation skills and evidence comparison with respect to this salient cultural form. If scholars and students do this, they stand to benefit from a richer understanding of culture and an expanded appreciation for the complexity of knowledge circulation. These are laudable goals for students and teacher, and will produce both with opportunities to engage hip-hop as an object and method of study.

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Modeling in Mathematics and History as Teaching and Learning Approaches to Pandemics

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Abstract: The integration of innovative interdisciplinary approaches to the K-12 Curriculum aims to deepen students' knowledge and help them develop transversal skills. Applying an interdisciplinary lens, with a focus on pandemics, can help shape attitudes by means of inculcating the values of responsible global citizenship, and a high sense of personal and social responsibility. In the midst of the current lock-down due to Covid-19, a teaching approach to pandemics is presented, as an interdisciplinary connection between history and mathematics, based on the methodology of modeling in mathematics and the humanities. The main research questions posed: a) can modeling, as analyzed in the scientific literature, be used to interpret pandemics, e.g. in the case of the 'plague of Athens' (430 B.C.), as analyzed in the primary sources? b) Can the mathematical tools of statistical analysis be used to understand prevention measures through the centuries? Taking a longue durée perspective on history, students were asked to work on additional cases of pandemics across time and space, mobilizing both their mathematical and historical knowledge: process numerical data from primary sources, study maps, combine and compare elements of the past and the present using mathematical epidemiological models and real numerical data to study and predict the spread of infectious diseases. This paper presents the assessment of the effectiveness of this approach, conducted by means of closed and open questionnaires, administered in two phases (pre- and post-teaching) to a sample of 40 students aged 16-17 years. The results highlight statistics as a key tool for understanding real-world situations, and record the strengthening of students' knowledge in history, the raising of their critical thinking skills, as well as their enhanced ability to tackle real-world problems and understand responsible decision-making processes. Finally, the paper suggests that such good practices can prepare students for the complexity of globalized knowledge.

Keywords: Modeling, History, Pandemics, Mathematics, Interdisciplinarity

Introduction

This paper describes an interdisciplinary approach to teaching and learning about pandemics to 16 - 17-year old students at a Greek public high-school, by means of applying mathematical/statistical models for infectious diseases to historical material, i.e., data and information from primary sources, both textual and visual, graphs, maps, pandemic-related art. The key questions asked are the following:

a) How can mathematical/statistical modeling be used to interpret pandemics of the present as well as the past?
b) How can statistical tools be used to help understand the necessity of prevention measures through the centuries?

The effectiveness of the approach was assessed by means of questionnaires administered to the students pre- and post-teaching. The teaching approach gave rise to the submission of a new interdisciplinary curriculum on the mathematics and history of infectious diseases in Greek secondary education.

The teaching method adopted was a discussion-oriented flipped classroom: the students had to go through the teaching materials, answer the questions, and be prepared to participate in the discussion during the remote online class which took place online, on the platform of the European School Network on April 1st, 2020.

Papadopoulou, M., Argyri, P., & Smyrnaiou, Z. (2020). Modeling in Mathematics and History as Teaching and Learning Approaches to Pandemics. In R. Thripp & I. Sahin (Eds.), *Proceedings of iHSES 2020-- International Conference on Humanities, Social and Education Sciences* (pp. 99-103), Washington, DC, USA. ISTES Organization.

Purposes

In an effort to curb the spread of Covid-19, educational institutions all over the world strove to replace face-to-face instruction with remote synchronous or asynchronous instruction. Our research team consisting of three researchers from the distinct fields of Classics (Papadopoulou), Mathematics (Argyri) and STEM Pedagogy in Secondary Education (Smyrnaiou), following the motto that 'crisis is a not-to- miss opportunity', prepared and delivered an interdisciplinary lesson on the topic of epidemics/pandemics. Teaching pandemics as part of life in the present, as well as the past responded to the increased relevance of this topic. The teaching aimed to expand the notion of disciplinary literacy as set out by the state-mandated high-school curricular goals in mathematics and history taking into account the students' set of critical and socio-emotional soft skills (Smyrnaiou 2020) as well as student work on the spreading of infectious disease spanning mathematics and biology (Askouni, Doulopoulou & Argyri 2020).

Outcomes

The outcomes of this effort are three-fold: first, a set of teaching materials (in Greek) including primary sources, exercises, and activities for the students. Second, an online student questionnaire consisting of 23 items combining a mixed approach (quantitative and qualitative) aimed at getting students to express their views on, as well as evaluate the teaching. Third, a 103-page long syllabus on pandemics / epidemics (in Greek) submitted to the 'Platform 21+ Lab' project of the Institute of Educational Policy (IEP) (http://iep.edu.gr/en/; http://iep.edu.gr/el/psifiako-apothetirio/skill-labs) (Smyrnaiou, Papadopoulou & Argyri 2020). Launched in the spring of 2020, this project of the Greek Ministry of Education aims to inform the Greek K-12 curriculum with the skills and literacies needed for students to keep up with the 21st century job market (OECD 2018). The curriculum submitted by our team falls under the thematic cycle entitled 'I take care of the environment-Prevention and Protection from Natural Disasters) and is to be implemented across Greek public middle schools in two phases starting September 2020.

Designing the approach

Key concepts

Modeling is a heuristic strategy in mathematics (Smyrnaiou & Weil-Barais 2005; Smyrnaiou et al. 2012) and in history (Leff 2003). Models play a central role in the mathematics of disease; therefore, the concept of modeling was central to the teaching. The SIR model is named after its three variables S (Susceptible), I (Infected), and R (Recovered). It is a simple way to illustrate the importance of social isolation for those infected. By staying at home, even before being infected, one moves directly from the Susceptibles to the Recovereds, without spreading the virus. Another fundamental parameter that governs the spread of diseases is the basic reproductive ratio, R_0. The higher its value, the faster an epidemic will progress.

The SIR model was taught in the context of a case study on the plague of Athens (430 BC) illustrating the importance of social distancing measures and the catastrophic consequences of lack thereof. The plague in ancient Athens at the beginning of the Peloponnesian war against Sparta had spread uncontrollably due to insufficient knowledge about what were the best prevention measures. The students had to study the text of Thucydides, the historian, who survived the plague that clearly states that the plague was at its the worst in the most densely populated areas, where people had sought refuge in order to escape the invasion of the Spartan army (Th. 2.52.1, see Crawley 2004). Also, the students were presented with estimates of different modern historians regarding the population of Athens and of the area within the walls inhabited by the refugees (after Patel 2019).

Content & Materials

The types of materials sent to the students prior to the instruction included primary textual and visual sources: infographics, charts, graphs, maps, and images and metadata of works of art inspired by infectious disease, openly accessible via Europeana (https://www.europeana.eu/), the biggest digital portal of cultural material containing over 50 million digitized resources from European cultural and memory institutions (galleries, libraries, archives, museums). The materials were organized in such a way so as to enable the students to refer directly to the tasks, when viewing the contents page.

Results

This section presents data collected by means of administering an open and closed student questionnaire consisting of 23 items pre- and post- teaching. The population sample was 16- to 17-year-old students of the Model School Evangeliki in Athens. It should be noted that public model schools in Greece recruite only high-achieving students after rigorous examinations.

Our survey consists both of quantitative and qualitative items, so as to get deeper and far-reaching results. To all intents and purposes, the adoption of a mixed methods approach combining quantitative and qualitative items increases the usefulness of the findings. The originality of our approach counterbalances the limited number of respondents. This in our view, is the main limitation of the conducted survey in terms of generalizability and external validity of the results.

Part 1 of the questionnaire (accessible online here: https://www.surveymonkey.com/r/7D3XWTH) consists of seven questions, of which three are closed-ended. Question 1 sought information about whether the students wanted to study a) mathematics/science b) humanities/social sciences or c) Not decided yet. The majority responded that they wanted to study mathematics/science (18.4%). The second choice was humanities/social sciences (7.25%). 11% responded that they had not decided yet.

Question 2 sought to reveal the students' expectations, which were: a/ linking mathematics to the humanities/history; b/ historical information about pandemics; c/ mathematical modeling/mathematics of pandemics; d/ new knowledge e/ knowledge about pandemics; f/ protection measures against pandemics.

Question 3 asked the students to state their reason for attending the lesson. 36% stated that it was because they loved mathematics, 14% because they were on good terms with the instructors (the corresponding author for history and the second author for mathematics), 3% said that was because they loved history and 11% for no particular reason.

Question 4 asked: 'How many times have you been taught interdisciplinarily/multi-disciplinarily?' Most of the students responded that had been taught interdisciplinarily twice before. The second most frequent answer was that they had not been taught interdisciplinarily before.

Question 5 asked the students to give examples of connections between positive studies (mathematics, physics, chemistry, etc.) with the humanities (Greek, literature, history, etc.). The students' responses highlighted chemistry, radiochronology, in particular, and its relation to archaeology:

Question 6 asked for the students' input in regard to cross-curricular connections between mathematics and history. The responses highlighted stereometry, statistics, algebra and analysis.

Question 7 focused on student perceptions on incorporating more cross-disciplinary content between the human sciences and the exact sciences into their learning, because it… a/ helps one become well-rounded; b/ prepares for real life; c/ helps bridge the gap between the 'hard' sciences and the humanities/social sciences; d/ expands knowledge; e/ promotes better understanding within subjects; f/ enhances skills; g/ provides motivation; h/ can provide a link with higher education.

Part 2 of the questionnaire consists of 6 items, of which only 2 are closed-ended. Question 1 asked the students to 'record the knowledge gained in history'. The students' answers focused on the following:
a/ knowledge of pandemics of the past and ways to deal with them then; b/ chronology of the epidemics - pandemics that have affected humanity to date; c/ the positive effect of popular perceptions about preventive measures against pandemics'; d/ about John Snow and how he helped the English people cope with a major epidemic'.

Question 2 asked the students to record the knowledge gained in mathematics. Their responses mentioned the following: a/ how to calculate the transmissibility of a disease; b/ greater familiarity with charts, recognition of exponential difference from the logarithmic model; c/ an idea about statistics and how diseases and pandemics spread; d/ which models describe the real situations more accurately and realistically; e/ the exponential and accounting function as well as for the normal distribution.

Question 3 asked students to qualify the connection between mathematics and history in a 5-point scale and their answers are as follows: extremely interesting 34%, very interesting 33%, somewhat interesting 25%, not so interesting 8%, not at all interesting 0%.

Question 4 asked the students' opinion in regard to the quality of the teaching. Half of them replied that it was of 'high quality' (6/12), one replied that is was 'very high quality' (8.33%), five replied that it was 'neither high nor low quality (41.67%).

Question 5 asked the students to write any suggestions for improvement of the teaching. Their replies included quantitative suggestions: asking for a/ more material, b/ more mathematics, c/ more case studies) and qualitative suggestions concerning the teaching and the online platform.

Question 6 asked the students to give suggestions and specific examples as to how the curriculum could include more lessons/topics making interdisciplinary connections between mathematics and history. The students' replies pointed at the history of mathematics.

Part 3 consists of eight questions on the skills improved (accessible online here: https://www.surveymonkey.com/r/V6F27WG). According to the students, the skills ranked on a 1-10 point Likert scale, as follows: analyzing information (87%), critical thinking (85%), ability to make reasoned decisions (81%), creativity (81%), intercultural understanding 77%), flexibility-adaptability (76%), organizational skills (69%), self-awareness/self-knowledge (60%). The final questions asked the students to rate the improvement of their knowledge in mathematics, history, and in regards to their attitude and motivation toward learning. Their responses are 66% (improvement in knowledge about the mathematics of pandemics), 80% (improvement in knowledge about the history of pandemics), and 86% in terms of their improvement in motivation toward learning.

Discussion & Conclusions

This paper presented an innovative teaching approach on pandemics/epidemics from an interdisciplinary perspective combining the mathematical modeling and the history of infectious diseases. Novel teaching/learning materials were developed and administered to the students prior to the teaching. This took place as soon as the schools transitioned to remote classes in order to prevent Covid-19 from spreading. The approach was evaluated both quantitatively and qualitatively. This mixed methods approach produced interesting results, especially with regard to the students' opinion about the interdisciplinary approach.

The most striking findings of the survey resulted from the qualitative data collected. The students expressed their enthusiasm with quite lengthy replies giving compelling reasons for the necessity of interdisciplinarity in teaching and learning. The students were intrigued by the topic and asked for more teaching/learning on this topic. They reported that the case studies using data about historical periods in order to practice mathematical content knowledge had enhanced their learning in both mathematics and history. From the different pandemics across time, they were very keen on further investigating the case of the cholera outbreak in London in mid-19th century and its curbing thanks to mapping of the affected neighborhoods by John Snow. Also, most students responded that were interested in pursuing studies in a field related to mathematics rather than history, and answered that they had coped better with new knowledge in history, rather than mathematics. Last but not least, the students reported their greatest improvement in the 'critically engaging with information' category, a skill which is in great demand in today's knowledge-based societies.

Despite the relatively small number of respondents, these results suggest that such interdisciplinary approaches are good practices that can prepare students for the complexity of globalized knowledge. In the coming academic year, the new interdisciplinary curriculum entitled 'Mathematics teaches…History interprets' that is based on the teaching approach, will be piloted in schools across Greece, so that it can be fully implemented country-wide in 2021-2022. It is aimed to equip students with both the knowledge and skills necessary to navigate natural disasters and global health issues in the 21st century.

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