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Factors Influencing Mathematics Teaching as a Career Choice (FIMT-Choice): An Instrument Development and Validation

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Abstract

The study developed and validated an instrument that assess the motivations of secondary mathematics pre-service teachers (SMPTs) in choosing mathematics teaching as their career, hereto referred as Factors Influencing Mathematics Teaching as a Career Choice (FIMT-Choice). The study adopted items from Factors Influencing Teaching as a Career Choice (FIT-Choice) instrument by Watt and Richardson and calibrated or added items suited to the local area. The notion that content mathematics could be among the motivations of secondary pre-service teachers in choosing math-teaching career was also considered. The study generated 56 final items in the FIMT-Choice instrument, which were validated among 171 secondary mathematics pre-service teachers (SMPTs) in two prominent teacher education institutions in the Cordillera Administrative Region, Philippines. Statistical tools such as Cronbach's Alpha, Bartlett's Test of Sphericity, Kaiser-Meyer-Olkin Measure of Sampling Adequacy and the Principal Component Factor Analysis were used to establish the reliability and validity of the instrument. The results suggest that the SMPTs consider 10 valid and reliable constructs in choosing mathematics teaching as their career. Particularly, the SMPTs separate the mathematics, the teaching, and the combined mathematics teaching aspects in their motivations in entering the mathematics-teaching career. Thus, the FIMT-Choice Scale assess more specific areas of motivations in choosing mathematic-teaching as a career among SMPTs compared with the FIT-Choice Scale by Watt and Richardson. Hence, the FIMT-Choice Scale is a more precise instrument in exploring the motivations of SMPTs in entering the methematics teaching career.

KEYWORDS

motivation
pre-service teachers
instrument validation

Introduction

In theory and in practice, there is no doubt that motivation spell out success in any endeavor, more so in the teaching-learning process. From the classical to the contemporary learning theories in Psychology, much has been said about the roles of motivations in learning. All around the world, researchers and educators explored and designed ways of motivating students to learn. Hand in hand with the exploration of the learning motivations, the

literature also presents studies on teaching motivations (Simmons & Colton, 1991; Good, 1993; Bigham, 2008; Rots & Aelterman, 2009; Low et al., 2010; Watt & Richardson, 2006, 2007, & 2012; Zhao, 2011; Curtis, 2011; Topkaya & Uztosun, 2012; Kilinc et al., 2012; Yuce et al., 2013). These motivations mainly refer to the extrinsic, intrinsic, altruistic and spiritual. Specifically, these includes child interaction, compensation and job security/job factor or fit, work condition, perceived abilities, desire to make a social contribution, shape the future, work with children/adolescents, interest in teaching, inspiration by role models, love of the subject, love of children/young people, fulfilling a mission, answering a calling, financial reasons, and fallback career, which is usually the least considered motivation (Good, 1993; Topkaya & Uztosun, 2012; Richardson & Watt, 2006; Bigham 2008; Low et al., 2010; Kilinc et al., 2012; Yuce, et al., 2013; Topkaya & Uztosun, 2012; Zhao, 2011; Brok et al., 2013; Watt et al., 2012). In the field of mathematics teaching, Curtis (2011) found that mathematics teachers enter teaching profession because of a desire to work with young people, a love of mathematics and wanting to make difference. However, these mathematics teachers leave the teacher profession due to low salary, teacher blame, and lack of administrative support.

In the case of the secondary mathematics pre-service teachers (SMPTs), no matter what or where the stimulus is coming from, it is conceivable that their motivations affect both of their academic and non-academic performances and their preparedness as future teachers. This is because those who considered the most relevant factors in choosing math teaching as their career, like interest and abilities in mathematics and teaching, are more feasible to perform better than those who considered the irrelevant factors, like choosing math teaching as a fallback career without having the prior interest and ability in math and teaching. Furthermore, the importance of motivation as a barometer of success is supported by conducted studies. For instance, Sparks-Langer et al. (1991) as cited by Good (1993), proposed that motivations of students in entering the teacher preparation programs clearly relate to their success as teachers. Also, if the motivations in choosing teaching as a career are clearly identified, then problems regarding the teaching profession could be determined and minimized, if not provided with a solution. For example, issues about teacher education curriculum, perceived myths about the teaching profession, recruitment and retention of teachers, and among others could be addressed. This was supported by Rots and Aelterman (2009) by revealing in their model of teacher education graduates' entrance to teaching that initial motivation for teaching affects the teaching commitment and intention of secondary pre-service teachers to enter teaching.

With the importance of motivation, researchers attempted to assess the motivations of individuals in entering the teaching career by developing research instruments (Good, 1993; Watt & Richardson, 2007). Within the past decade, it seems that the Factors Influencing Teaching as a Career Choice (FIT-Choice) Scale by Watt and Richardson (2007) appears to be the most utilized instrument in exploring the motivation of pre-service teachers in choosing teaching career (Watt & Richardson, 2006; Watt et al., 2012a, 2012b; Brok et al., 2013). However, there seems to be no instrument yet to assess the motivations of pre-service teachers in choosing math teaching as their career, particularly in the Philippine context. Thus, the present study endeavored to develop and validate an instrument that determines the motivations of secondary mathematics pre-service teachers in choosing mathematics-teaching career.

Theoretical Background

Mathematics teaching in the Philippine context. In the Philippines, it a common passage that "teaching will not lead you to financial richness". Teaching in the country is considered as a non-financially rewarding profession. In lieu of this, the Philippine government had just completed a four-year staggered increase of salary among teachers. Also, the Department of Education granted a three-step salary increase among science or math public school teachers in 2012 to stimulate further improvement in the teaching of these major fields. According to the DepEd Secretary, Br. Armin L. Luistro, science and mathematics are critical tools of industrialization that are much needed to improve the country's global competitiveness. Recently, the Philippine government also approved the Salary Standardization Law (SSL), which raised the salary of government employees including mathematics teachers in the public schools of the country.

In addition, it is observed that different

teacher education institutions in the country produce thousands of teacher graduates annually but there seems to be limited teaching slots, which leads to a widespread unemployment or underemployment. Another concerning issue involving teaching in the country is the consistently low performance of the teacher education graduates in their board examination. In fact, the past seven Licensure Examination for Teachers (LET) results in the last four years (2012-2015) reported a mean of 34.59% national passing rate and the latest result in March 2015 exposed a passing rate of 31.63%. This implies that only around one-third of the secondary teacher education graduates pass their licensure examination. This is concerning most especially that the new K to 12 Curriculum raised the bar of expectations among basic education math teachers in the country.

Thus, it is interesting to explore why the SMPTs entered the math teaching career considering the following: (1) the abstract nature of mathematics, which may not be directly applicable to real-life situations; (2) the current math teaching circumstances in the Country like the implementation of the new K to 12 Curriculum which heightened the bar of expectations among math teachers; (3)the recent salary increase among teachers; and, (4)the apparently poor mathematics performance of students in the country based from recent national and international assessments.

The FIT-Choice scale. The motivation construct as a subject of research was formalized by theories in psychology. Particularly, the Factors Influencing Teaching Choice (FIT-Choice) Scale by Watt and Richardson (2007), which served as the basis of the present study, was mainly grounded on the theory of expectancy-value. As cited by Watt and Richardson (2007), expectancy-value theory is one of the major frameworks for achievement motivation, beginning with Atkinson (1957), being further developed by Battle (1965), Crandall et al. (1962), Crandall (1969), and more recently by Father (1982, 1988, 1992) and Eccles et al. (1983, 1984, 1992 and 1994). They added that generally, expectancy-value theorists have regarded success expectancies and task valuation as major determinants of motivation for academic choices with more proximal influences consisting of socialization and preparations of previous experiences. They further cited that the FIT-Choice Scale was anchored with the three major set of variables (self, value and task) that predict choices in Eccles et al. (1983 and 2000) expectancy-value model, including items for antecedent socialization and perceptions of previous experience.

In 2012, Watt and Richardson developed the FIT-Choice Model to assess the primary motivations of teachers to teach, based from the empirical studies conducted internationally, using the FIT-Choice Scale that they developed in 2007. They cited that this model both includes the altruistic-type of motivations that have been emphasized in the teacher education literatures as well as more personally utilitarian motivations, intrinsic and ability-related beliefs.

Developing an instrument for secondary mathematics pre-service teachers. The present study adopted the different constructs on motivations in choosing teaching as a career as proposed by Watt and Richardson (2007, 2008 & 2012) and the proposal of Good (1993) that subject content motivation is one of the motivations for pre-service teachers in choosing teaching as a career. Specifically, the present study adopted the following constructs under the FIT-Choice Scale: (1) perceived teaching abilities – this refers to the perceptions of abilities in teaching, in general; (2) intrinsic career value – this measures the individual's innate interest in and desire for a teaching career; (3) job security – assesses the extent that individuals consider teaching as a career path that offers reliable income; (4) time for family – measures the extent to which an individual selects teaching because a teaching career allows more family time, and teaching hours and school vacations allow for family commitments and desirable quality of life issues; (5) job transferability – assesses the perceptions of teaching as being useful overseas employment and travelling and as allowing greater choice of where to live; (6) shape future of children/adolescents–examined whether individuals had chosen teaching for the opportunity to shape child/ adolescent values and influence the next generation ; (7) enhance social equity – assessed the extent to which participants desired to benefit the socially disadvantaged and raise the ambitions of underprivileged youth; (8) make social contribution – this assesses whether individuals choose teaching because of its potential to contribute by giving back a service to the society; (9) work with children/adolescents – focused

on individuals' desire to engage in a career that involved working with and helping young people; (10) prior teaching and learning experiences – this measures the degree of contributions of prior learning and teaching experiences in considering teaching as a career; (11) social influences – this measures the possible impacts of the social environment of an individual, like family, friends and peers in choosing teaching as a career; and (12) fallback career – this evaluates whether individuals chooses teaching for the reasons relating to not being accepted into their university degree of choice or being unsure what career they wanted.

In addition, the present study considered the possibility that mathematics pre-service teachers may have chosen mathematics teaching because of the mathematics as the major field of specialization or because of mathematics teaching itself. This has been observed also by the researcher, as a mathematics instructor in a state university, when asking his mathematics pre-service teacher students regarding their motivations in entering the math teaching career.

Methodology

The study developed and validated an instrument to assess the motivations of the secondary mathematics pre-service teachers (SMPTs) in choosing math teaching as their career. This was done by initially adopting items from the FIT-Choice Scale by Watt and Richardson (2007) while considering the notion that the SMPTs may have choosen math teaching as their career because of the mathematics as the field of specialization, the teaching aspect itself or the combined math teaching aspect.

Instrument Development

In the development process of the items of the FIMT-Choice Scale, the researcher secured the permission of the authors of the FIT-Choice Scale thru Dr. Hellen Watt, to adopt and validate their instrument in the context of the study. Since the FIT-Choice Scale by Watt and Richardson (2007) was developed outside the country, which may imply cultural discrepancies with the present study site, the original 38 items were subjected for clarity and relevance evaluations in the context of the present study before these were included in the initial items of the present study. The evaluation was done by the researcher, together with five other instrument evaluators from different fields, which included a statistician, guidance counselors, and professional education mentors of the SMPTs. This resulted to some minor changes for clarity purposes in the context of the study.

Moreover, the study considered also that the SMPTs may have chosen math teaching as their career because of the teaching aspect in general; the mathematics facet as their major field of specialization; or the mathematics teaching aspect itself. This resulted to the creation of new items parallel to the improved items taken from the FIT-Choice Scale, and pertaining to mathematics as the major field of specialization and math teaching itself. For instance, the items 'I am good in doing math', 'I chose mathematics as a last-resort major field' and 'math has been my favorite subject' are examples of the added items pertaining to mathematics as major field of specialization; while the items 'I am interested in math teaching', 'math teaching will allow me to develop the problem-solving skills of students' and 'people I have worked with think I should become a math teacher' are some of the added items pertaining to math teaching. The creation of new items as well as the integration of all comments and suggestions from the instrument validators resulted to the development of 75 items pertaining to reasons that may have influenced the SMPTs in choosing math teaching as their career. These 75 items served as the initial items of the FIMT-Choice Scale piloted for factor analysis and reliability test. Further, the seven-point Likert levels in the original FIT-Choice Scale was reduced to a six-point Likert levels with the understanding that the levels 'unimportant' and 'not at all important' have the same meaning.

In the piloting process, the 75 initial items of the FIMT-Choice Scale were printed in a three-page 8" by 13" bond paper. Also, the statement to be completed by the respondents in choosing their answer "I chose to become a math teacher because...", with the six Likert level options, were inserted in every interval of five to six items to make sure that the respondents are well guided in choosing their appropriate answer. Before finally piloting the original items of the FIMT-Choice Scale, the researcher secured

the permission from the concerned offices of the participating higher education institutions (HEIs). Moreover, to further improve the face validity of the survey, the participants were asked, as part of the given instructions, to encircle unclear statement items in the survey questionnaire. However, no item has been encircled, which indicates that the initial items of the FIMT-Choice Scale were clearly stated in the context of the study. Lastly, to assure the consistency in giving directions and avoid possible discrepancies in the process of administering the survey, the researcher personally administered the questionnaire to all participants.

Participants

With the permission of the concerned offices of the participating institutions, the initial 75-item FIMT-Choice Scale survey was administered to 171 secondary mathematics pre-service teachers in one public and one private teacher education institutions (TEIs) in the province of Benguet and in Baguio City, respectively, during the second semester of the academic year 2014-2015. The participants included all first to third year students of the participating HEIs since the 4th years were out for their student-teaching requirement. Table 1 indicates that 27% of the participants are freshmen, 40% are sophomores and 33% of them are junior SMPTs. In terms of sex, 24% are males and 75% are females, while 1 of them did not specify his/her sex. In terms of the type of school, 66% are from a public HEI and 34% are from a private HEI. Their age ranges from 16 to 23 years old (mean = 18.03) where the bulk of participants are 18-19 years old (47%) followed by 16-17 years old (36%) and 20-21 years old (11%), and only 2% of them were 22-23 years old.

Determining the Final Sample for Analysis

Although the participants of the study were asked to answer the items voluntarily, the piloting of the survey question items was done in a class. That is, some of the participants may felt obligated to complete the survey but lacked the motivation to engage in the survey (Zelkowski et al., 2013). Thus, before the extracted data were subjected for statistical analysis, the researcher manually inspected the responses by looking for possible patterns of answering that may indicate lack of motivation to engage with the survey. No such pattern was found and that the variance of each respondent's response is greater than the 10% of the overall variance.

Data Analysis

The internal reliability of the initial and finalized items of the instrument was established using the Cronbach's alpha. Also, the Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy were used as preliminary test before performing the principal component factor analysis to cluster the survey items on motivations in choosing math teaching as a career. In the factor analysis, the Varimax rotation was used and factor loadings with a value equal to or greater than 0.5 were considered in the clustering process. The researcher manually checked the relevance of each item in each component before coming up with the finalized items of the FIMT-Choice Scale.

Table 1

Demographic Profile of the Participants

Parameter	Categories	Frequency	Percentage
Age	16-17	62	36
	18-19	80	47
	20-21	19	11
	22-23	3	2
Sex	Male	41	24
	Female	129	75
	Not indicated	1	1
Type of School	Public	113	66
	Private	58	34
Year Level	Freshmen	46	27
	Sophomore	69	40
	Junior	56	33
Total		171	100

Results and Discussion

Before conducting a factor analysis, the Cronbach's Alpha was determined to establish the internal reliability of the initial items of the instrument. The reliability test result indicates a Cronbach's Alpha value ranging from 0.953 to 0.957 with an overall Cronbach's Alpha value of 0.954. Thus, all of the initial items were included in the factor analysis.

The 75 initial items of the FIMT-Choice survey (Table 2) were clustered using the Factor Analysis. This was in consideration with the significant result of the Bartlett's Test of Sphericity ($p<.01$) and the relatively high value (0.882) of the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. The significant result of the Bartlett's Test of Sphericity indicates that the variables are unrelated and therefore unsuitable for structure detection. On the other hand, the KMO Measure of Sampling Adequacy is a statistic that indicates the proportion of variance of the variables that might be caused by underlying factors. Further, Figure 1 shows the Scree Plot of the initial items of the instrument. The plot indicates eight significant motivation factors considered by the SMPTs in choosing math teaching as their career. It was also noted that the original FIT-Choice Scale, which served as the basis of the present study, has 12 factors. Thus, the researcher initially considered all the factors with Eigenvalues greater than one in the factor analysis result.

The factor loadings for principal component analysis with Varimax Rotation (see Appendix A) indicate that the rotation converged in 14 iterations. Considering all items with Eigenvalues greater than one, the factor analysis resulted to 14 factors. However, considering loadings with a value greater than or equal to 0.5, 63 valid items under 11 components were detected with the eleventh component having only one item. That is, 12 items were not detected in the factor analysis due to loadings of less than 0.5 in all of the 14 factors.

Now, since component 11 has only one detected item and the question items from components 10 and 11 are closely related, both referring to the social contributions of teaching, these two components were merged into one construct. Also, each item in the different components was evaluated in terms of its relevance and consistency with the other items. This resulted to the removal of five items which

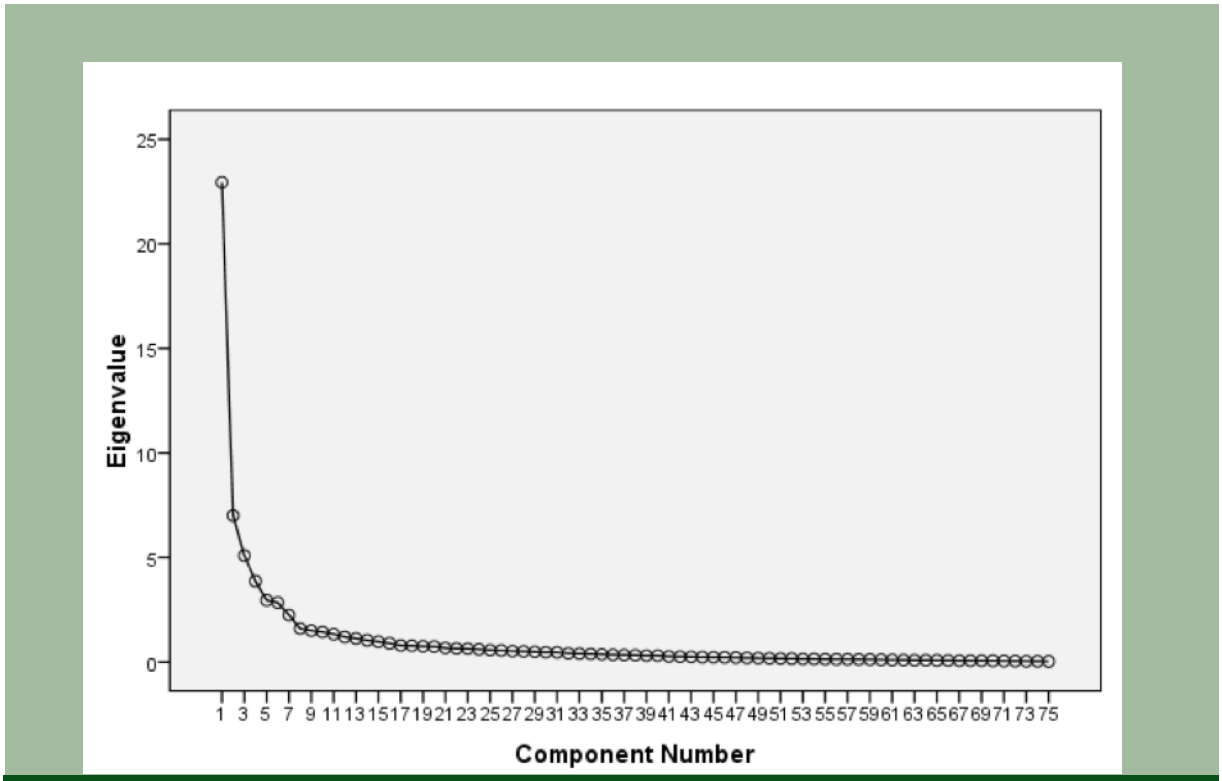

Figure 1. The Scree Plot of the Initial Items of the Instrument

Table 2

The Finalized Items of the FIMT-Choice Scale

	COMPONENT/ITEMS	Factor Loading
1. PERCEIVED MATH AND MATH TEACHING ABILITIES AND INTEREST		
Q66	I am good in doing math.	0.876
Q61	I am good in solving math problems.	0.854
Q71	I can easily grasp mathematical concepts.	0.823
Q25	Math teaching is a career suited to my abilities.	0.785
Q67	Mathematics is my field of interest.	0.780
Q72	I love mathematics.	0.762
Q62	I like a math-related career.	0.743
Q69	Mathematics has been my favorite subject.	0.734
Q13	I have good math teaching skills.	0.702
Q74	I enjoy teaching math.	0.634
Q2	I am interested in teaching math.	0.607
2. WORK AND IMPACT CHILDREN/ADOLESCENTS LIVES		
Q34	I like working with children/adolescents.	0.832
Q10	I want a job that involves working with children/adolescents.	0.813
Q22	I want to work in a child/adolescent-centered environment.	0.791
Q31	Teaching will allow me to have an impact on children/adolescents' lives.	0.706
Q42	Teaching will allow me to have an impact on children/adolescents' career choice.	0.703
Q32	Teaching will allow me to work against social disadvantage.	0.506
3. MATH TEACHING'S SOCIAL CONTRIBUTION		
Q53	Math teaching will allow me to convey the importance mathematics.	0.773
Q52	Math teaching will allow me to influence the next generation's perception of mathematics.	0.727
Q43	Math teaching will allow me to raise the confidence of students who are struggling in math.	0.723
Q44	Math teaching will allow me to raise the positive perception of mathematics.	0.695
Q68	Math teaching will allow me to influence the next generation's problem solving skills.	0.665
Q73	Math teaching will allow me to impart the applications of math in real life situations.	0.631
Q64	Math teaching will allow me to develop problem solving skills of students.	0.550
4. PERCEIVED TEACHING ABILITIES AND INTEREST		
Q57	I've always wanted to be a teacher.	0.791
Q38	I like teaching.	0.781
Q14	I am interested in teaching.	0.676
Q56	Teaching is a career suited to my abilities.	0.653
Q47	I have good teaching skills.	0.581

Continuation of Table 2...

5. SOCIAL INFLUENCES		
Q36	People I have worked with think I should take math as my major field.	0.835
Q70	People I have worked with think I should become a teacher.	0.827
Q46	My friends think I should become a teacher.	0.789
Q24	My family think I should take math as my major field.	0.767
Q55	My family think I should become a teacher.	0.765
Q12	My friends think I should take math as my major field.	0.531
6. PRIOR MATH TEACHING AND LEARNING EXPERIENCES		
Q45	I have had inspirational teachers.	0.858
Q23	I have had good math teachers as role-models.	0.850
Q54	I have had good teachers as role-models.	0.840
Q11	I have had inspirational math teachers.	0.816
7. JOB SECURITY AND OPPORTUNITY		
Q28	Teaching will be a secured job.	0.797
Q16	Teaching will provide a reliable income.	0.684
Q59	Math teaching is an in-demand career.	0.675
Q4	Teaching will offer a steady career path.	0.653
Q75	Teaching will provide me a comfortable income.	0.584
8. FALLBACK CAREER		
Q49	I chose math teaching as a last-resort course.	0.872
Q39	I chose teaching as a last-resort career.	0.856
Q58	I chose math as a last-resort major field.	0.804
9. TIME FOR FAMILY		
Q5	Part-time teaching could allow more family time.	0.779
Q29	School holidays will fit in with my family commitments.	0.667
Q17	Teaching hours will fit with the responsibilities of having a family.	0.625
Q51	As a teacher, I will have short working days.	0.510
Q63	As a teacher, I will have a balanced work and family time.	0.503
10. TEACHING'S SOCIAL CONTRIBUTION		
Q9	Teaching will allow me to provide a service to society.	0.748
Q7	Teaching will allow me to shape child/adolescent values.	0.632
Q8	Teaching will allow me to raise the ambitions of underprivileged youth.	0.536
Q20	Teaching will allow me to benefit the socially disadvantaged.	0.564

are grouped with items in a different construct and the deletion of two items which are classified under two factors.

As a whole, 19 items were deleted in the process. These include the 12 items with factor loading less than 0.5 (Q3- I was unsure of what career I wanted., Q6- Teaching will be a useful job for me to have when travelling., Q15- I was unsure of what major field to take., Q18- A teaching qualification is recognized everywhere., Q19- Teaching will allow me to influence the next generation., Q21- As a teacher, I will make a worthwhile social contribution., Q27- I was not

accepted into my first-choice career., Q30- A teaching job will allow me to choose where I wish to work., Q33- Teaching will enable me to 'give back' to society., Q40- Teaching could be my stepping stone for other jobs., Q50- Aside from math teaching, I can also teach other major fields., and Q65- I have had inspirational mathematicians.); five (5) items which are irrelevant with the majority items in a certain component (Q35- I have had positive learning experiences in math., Q37- I have the qualities of a good teacher., Q41- As a teacher, I will have lengthy holidays/vacation., Q48- I've always wanted to be a math teacher., and Q60- I have had positive learning experiences.); and the clustering of two (2) items into more than one components (Q1- I have the qualities of a good math teacher., and Q26- I like teaching math).

Table 2 and 3 show the finalized items of the instrument. It shows that there are 56 final items for the FIMT-Choice Scale under ten factors, with a number of items in each factor ranging from three to eleven. Of the 56 items, 27 were items from the adopted FIT-Choice scale. Each of the ten resulting constructs was named based from its item components.

In Table 4, the 56 final items of the FIMT-Choice Scale were subjected to reliability test using the Cronbach's alpha. The table indicates that component 10 (Teachings social contributions) has the lowest reliability index but this may be due to the merging of items from two different clusters of the factor analysis result. Nevertheless, the finalized items of the FIMT- Choice Scale obtained a relatively high index of internal reliabilities, ranging from high reliability to very high reliability in each of the 10 components and a very high reliability index (0.95) based from the rule of thumb as cited from Lubrica (2005). Considering also that an index value of 0.80 is acceptable in a teacher-made psychometric test, the FIMT-Choice Scale is concluded to be highly reliable instrument in assessing the motivations of the SMPTs in choosing math teaching as their career.

The development and validation process reports that the FIMT-Choice Scale is a highly reliable instrument in assessing the motivations of secondary mathematics pre-service teachers in entering the math teaching career. This is indicated by the relatively high to very high internal reliability index in each of the ten components. It is noted that the 'Teaching's Social Contributions' component may have revealed the lowest reliability index because of the merging of items which are originally from two different components in the factor analysis result. Nevertheless, the overall result indicates a very high internal reliability index with a Chronbach's alpha value of 0.947.

Moreover, the clustering of the items in the FIMT-Choice Scale confirms some of the constructs and at the same time indicates a regrouping of the items in the FIT-Choice Scale by Watt and Richardson (2007). For instance, the constructs on time for family; social influences; and fallback career was retained in the new instrument. On the other hand, the items on the 'perceived teaching ability' and 'intrinsic career value' constructs as well as the items on 'shape the future of children/adolescents', 'enhance social equity' and 'work with children/adolescents' in the FIT-Choice Scale were merged and turn out to be the "Perceived teaching abilities and interests" and "Work with and impact children/adolescents lives" constructs, respectively, in the current FIMT-Choice Scale. Another observation is that two constructs pertaining to mathematics and math teaching emerged. These are the "Perceived math and math teaching abilities/interests" and "make social contribution" constructs. It was also observed that the clustering of items differentiates the constructs on "perceived math and math teaching abilities/interests" and "make social contribution" through mathematics teaching with the constructs on "Perceived teaching abilities/interests" and "Teaching's social contribution", respectively. Lastly, the constructs on "Social influences", "Fallback career", "Job security and opportunity", and "Prior math teaching and learning experiences" include items pertaining to a mixtures of mathematics, mathematics teaching, and teaching in general.

Thus, the result confirms the proposal of Good (1993) that subject content motivation is one of the motivations for pre-service teachers in choosing teaching as a career. The outcome also affirms the findings of Curtis (2011) that love of mathematics, desire to work with young people and wanting to make difference are among the reasons why mathematics teachers enter the teaching profession. These are evident in the findings of the present study that the SMPTs

Table 3

The Finalized Items of the FIMT-Choice Scale

Component	Item Nos.	No. of Items	Sample Item
1. Perceived Math and Math Teaching Abilities and Interests	Q66, Q61, Q71, Q25, Q67, Q72, Q62, Q69, Q13, Q74, Q2	11	I am good in doing math.
2. Work with and impact Children/ Adolescents' Lives	Q34, Q10, Q22, Q31, Q42, Q32	6	I like working with children/adolescents.
3. Math Teaching's Social Contribution	Q53, Q52, Q43, Q44, Q68, Q73, Q64	7	Math teaching will allow me to convey the importance of mathematics.
4. Perceived Teaching Abilities and Interests	Q57, Q38, Q14, Q56, Q47	5	I've always wanted to be a teacher.
5. Social Influences	Q36, Q70, Q46, Q24, Q55, Q12	6	People I have worked with think I should take math as my major field of specialization.
6. Prior Math Teaching and Learning Experiences	Q45, Q23, Q54, Q11	4	I have had inspirational teachers.
7. Job security and Opportunity	Q28, Q16, Q59, Q4, Q75	5	Teaching will be a secured job.
8. Fallback Career	Q49, Q39, Q58	3	I chose math teaching as a last-resort course.
9. Time for Family	Q5, Q29, Q17, Q51, Q63	5	Part time teaching could allow family time.
10. Teaching's Social Contributions	Q9, Q7, Q8, Q20	4	Teaching will allow me to provide a service to society.
Total		56	

may choose mathematics teaching as their career because of the mathematics, teaching and the combined mathematics teaching features of the career. This is also indicated by the result that three of the 10 components of the validated FIMT-Choice Scale and 25 out of the 56 finalized items of the Scale pertain to mathematics as the major field of specialization in the mathematics teaching career or math teaching itself. Thus, the FIMT-Choice Scale assess more specific areas of motivations in choosing mathematics teaching as a career compared with the FIT-Choice Scale by Watt and Richardson (2007), which measure the motivations in choosing teaching as a career, in general.

Table 4

The Reliability Test of the Different Components of the Finalized Items of the FIMT-Choice Scale

Component	Cronbach's Alpha	Description
1. Perceived Math and Math Teaching Abilities and Interests	0.949	Very high reliability
2. Work with and impact Children/Adolescents' Lives	0.911	Very high reliability
3. Math Teaching's Social Contribution	0.946	Very high reliability
4. Perceived Teaching Abilities and Interests	0.932	Very high reliability
5. Social Influences	0.818	High reliability
6. Prior Math Teaching and Learning Experiences	0.931	Very high reliability
7. Job security and Opportunity	0.825	High reliability
8. Fallback Career	0.915	Very high reliability
9. Time for Family	0.828	High reliability
10. Teaching's Social Contributions	0.758	High reliability
Overall	0.947	Very high reliability

Note:

Alpha Value	Description	Alpha Value	Description
0.00 – 0.20	slight reliability	0.71 – 0.90	High reliability
0.21 – 0.40	Low reliability	0.91 – 1.00	Very high reliability
0.41 – 0.70	Moderate reliability		

Conclusions

The study showed that the SMPTs consider 10 valid and reliable constructs in choosing mathematics teaching as their career. These include perceived Math and Math teaching abilities and interests; work with and impact children/adolescents' lives; math teaching's social contribution; perceived teaching abilities and interests; social influences; prior math teaching and learning experiences; job security and opportunity; fallback career; time for family; and teaching's social contributions. Also, the SMPTs separate the mathematics, the teaching, and the combined mathematics teaching aspects of the mathematics teaching career as their motivations in entering the career. Thus the FIMT-Choice Scale assess more specific areas of motivations in choosing mathematics teaching as a career among SMPTs compared with the FIT-Choice Scale by Watt and Richardson (2007), which measure the motivations in choosing teaching as a career, in general.

With the existence of this developed and validated instrument, the motivation of the SMPTs in entering the math teaching career may be explored for the following purposes: First, for possible remediation in their preparations as future math teachers. For instance, knowing their prevailing motivations in choosing mathematics teaching as their career may lead to remediation in instructions to accommodate and increase their motivations in the mathematics teaching career. Second, for the exploration of the influence of the SMPTs' motovation in entering the math teaching career on their academic and non-academic performance in their college education; their readiness in teaching mathematics; their commitment to mathematics teaching; and their desire to enter the mathematics teaching job. This may lead to the identification of the best motivation factors that should be considered in entering the mathematics teaching career for a more successful career.

Recommendations

Eventually, this may be used in the career guidance of students who are planning to enter the mathematics teaching career. Likewise, further research may be conducted also to explore the possible variables that affect the

motivations of the SMPTs in choosing math teaching as their career.

Moreover, mixed-methods research designs would be strong for examining the motivations of the SMPTs in entering the math teaching career using this survey together with background study and interviews to strengthen research findings on why individuals enter the mathematics teaching career. Also, the instrument may be used as a preliminary assessment in case studies and longitudinal studies involving the motivations of SMPTs in choosing math teaching as their career. Case studies in each of the ten factors of the instrument and longitudinal studies may be conducted to come up with holistic study results on why individuals enter the mathematics teaching and its possible implications in their success in the career. Lastly, similar studies may be conducted in the other regions of the Country for further validations of the FIMT-Choice Scale to strengthen its reliability in the Philippine context.

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Appendix A

Factor loadings for principal component analysis with Varimax Rotation

QItem	Component													
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Q66	0.876	0.130	0.127	0.084	0.089	-0.016	0.042	0.065	0.077	0.028	0.098	-0.021	0.074	-0.049
Q61	0.854	0.166	0.137	0.016	0.061	-0.006	0.080	0.065	0.004	0.082	0.143	0.058	0.069	0.131
Q71	0.823	0.152	0.106	0.118	0.046	-0.060	0.000	0.031	0.016	0.074	0.110	0.077	-0.120	0.142
Q25	0.785	0.045	0.048	0.255	0.077	0.087	-0.007	-0.063	0.073	0.118	0.043	0.041	-0.068	-0.002
Q67	0.780	-0.120	0.279	0.090	-0.008	0.241	0.081	-0.066	-0.035	0.032	0.046	-0.161	-0.018	0.109
Q72	0.762	-0.088	0.326	0.096	-0.011	0.119	0.152	-0.078	0.070	-0.123	-0.017	-0.175	0.044	0.022
Q35	0.759	0.121	-0.016	0.032	0.138	0.266	-0.081	-0.053	0.046	0.076	0.015	0.170	0.022	0.026
Q62	0.743	-0.001	0.301	0.012	0.033	0.126	0.062	0.035	0.019	0.049	-0.065	0.003	0.139	-0.037
Q69	0.734	-0.174	0.311	0.016	0.000	0.230	0.070	0.003	0.042	-0.034	-0.086	-0.208	-0.001	0.061
Q60	0.726	0.102	-0.007	0.162	0.207	0.248	0.068	-0.030	-0.008	0.037	0.074	0.093	0.018	-0.075
Q13	0.702	0.097	0.153	0.146	0.035	-0.008	0.057	-0.041	0.059	0.105	0.058	0.402	0.135	0.059
Q74	0.634	0.230	0.181	0.429	0.099	0.074	0.013	-0.133	0.129	-0.001	0.122	-0.027	-0.037	-0.075
Q26	0.632	0.138	0.108	0.540	0.062	0.168	-0.014	-0.173	0.156	0.044	0.040	-0.110	0.021	0.005
Q2	0.607	0.081	0.092	0.365	-0.023	0.176	-0.018	-0.199	0.217	0.147	0.028	0.036	0.058	-0.219
Q37	0.604	0.262	0.135	0.324	0.202	-0.011	0.131	-0.087	-0.009	-0.012	0.219	0.368	0.023	0.022
Q1	0.588	0.126	0.038	0.146	0.078	-0.042	0.022	-0.029	0.154	0.085	0.055	0.588	0.007	-0.083
Q34	0.097	0.832	0.138	0.248	0.124	0.169	0.150	-0.099	0.000	-0.020	-0.016	0.047	-0.006	-0.059
Q10	0.019	0.813	0.169	0.247	0.023	0.036	0.045	-0.023	0.148	0.050	-0.173	0.024	-0.097	0.004
Q22	0.088	0.791	0.178	0.286	0.020	0.188	0.009	0.020	0.110	0.157	0.031	-0.031	-0.042	-0.103
Q31	0.139	0.706	0.281	0.135	0.121	0.051	0.185	0.040	0.070	0.191	0.223	0.032	0.085	0.096
Q42	0.187	0.703	0.324	0.117	0.046	0.096	0.132	0.109	0.091	0.101	0.097	0.113	0.126	-0.073
Q32	0.051	0.506	0.262	0.099	0.129	0.093	0.177	0.207	-0.042	0.190	0.130	-0.032	0.382	0.154
Q53	0.336	0.256	0.773	0.156	0.011	0.145	0.137	-0.080	0.116	0.111	0.046	0.033	0.009	0.028

Appendix A Continuation...														
Q52	0.282	0.317	0.727	0.238	-0.012	0.145	0.181	-0.084	0.073	0.081	0.079	-0.024	0.059	0.065
Q43	0.227	0.377	0.723	0.104	-0.027	0.129	0.045	-0.024	-0.018	0.042	0.098	-0.034	0.058	-0.087
Q44	0.312	0.133	0.695	0.087	-0.006	0.171	0.103	-0.114	0.011	0.175	-0.008	0.187	0.110	0.021
Q68	0.367	0.342	0.665	0.140	0.006	0.110	0.148	-0.093	0.128	0.100	0.057	0.041	0.083	0.060
Q73	0.385	0.165	0.631	0.103	0.079	0.006	0.047	-0.047	0.065	0.278	0.127	-0.076	-0.041	0.142
Q64	0.494	0.300	0.550	0.089	-0.028	0.116	0.174	0.010	0.121	0.192	0.074	0.003	-0.034	0.028
Q57	0.250	0.236	0.186	0.791	0.066	0.199	0.086	-0.041	0.063	0.062	0.019	-0.083	0.053	-0.024
Q38	0.278	0.261	0.159	0.781	0.049	0.165	0.052	-0.039	0.038	0.049	0.073	0.127	0.105	0.005
Q14	0.182	0.374	0.120	0.676	0.074	0.069	0.038	-0.197	0.058	0.096	0.054	0.268	-0.009	-0.059
Q56	0.385	0.224	0.078	0.653	0.151	0.239	0.090	-0.027	0.064	0.163	0.134	0.079	0.087	0.022
Q48	0.387	0.229	0.160	0.621	0.072	0.267	0.077	-0.164	0.091	0.003	0.033	-0.249	-0.054	0.025
Q47	0.485	0.235	0.116	0.581	0.170	0.136	0.141	-0.027	0.064	0.069	0.147	0.188	0.139	0.081
Q36	0.195	0.065	0.025	0.070	0.835	0.119	0.002	0.083	0.038	-0.033	-0.097	-0.003	0.077	-0.063
Q70	0.103	0.163	0.028	0.221	0.827	0.056	0.020	0.175	0.012	-0.063	-0.029	0.014	-0.073	0.050
Q46	0.017	0.113	0.099	0.153	0.789	0.213	0.092	0.103	0.035	-0.024	-0.030	-0.031	0.107	-0.029
Q24	0.075	-0.118	-0.063	-0.045	0.767	0.086	0.097	0.102	0.020	0.105	-0.003	0.179	0.089	-0.013
Q55	0.050	0.096	-0.126	0.041	0.765	0.105	0.154	0.130	0.045	0.146	0.034	0.070	-0.053	0.126
Q12	0.151	0.049	0.165	-0.108	0.531	-0.089	0.012	-0.145	0.232	-0.002	-0.038	-0.219	-0.092	-0.108
Q45	0.181	0.055	0.161	0.142	0.203	0.858	0.011	-0.030	0.062	0.038	-0.072	0.013	0.156	-0.041
Q23	0.196	0.112	0.119	0.119	0.087	0.850	-0.049	0.026	0.095	0.054	-0.047	0.019	-0.064	0.057
Q54	0.250	0.148	0.076	0.126	0.172	0.840	-0.058	0.011	0.009	-0.035	0.059	0.019	-0.121	0.074
Q11	0.142	0.130	0.164	0.203	0.043	0.816	0.020	0.061	0.163	-0.044	-0.048	-0.047	0.052	-0.083
Q28	0.031	0.198	0.056	0.003	0.140	0.040	0.797	-0.089	0.134	0.011	-0.028	-0.024	0.012	0.030
Q16	0.088	0.218	-0.015	0.267	-0.039	0.013	0.684	0.211	0.193	0.023	-0.076	0.005	0.134	0.058
Q59	0.080	-0.062	0.248	-0.089	0.185	-0.022	0.675	0.143	0.006	0.131	-0.049	-0.001	-0.041	-0.149
Q4	-0.031	0.102	0.150	0.082	-0.199	-0.156	0.653	-0.044	0.325	0.198	-0.063	0.098	-0.230	0.008
Q75	0.237	0.203	0.103	0.286	0.137	-0.051	0.584	0.292	0.283	-0.026	0.083	-0.109	0.096	0.116

Appendix A Continuation...

Q49	-0.071	-0.005	-0.124	-0.177	0.056	0.011	0.052	0.872	0.050	-0.030	-0.133	-0.038	0.042	-0.140
Q39	-0.090	-0.062	-0.032	-0.102	0.092	-0.014	0.057	0.856	0.121	0.010	-0.156	-0.015	-0.001	-0.045
Q58	-0.065	0.087	-0.164	-0.108	0.182	0.059	0.021	0.804	0.087	0.007	-0.137	0.019	0.014	-0.137
Q41	0.028	-0.069	0.103	0.192	0.212	0.008	0.252	0.543	0.457	-0.100	0.086	0.009	0.137	0.093
Q5	0.017	0.019	0.058	0.049	-0.036	0.102	0.108	0.083	0.779	0.105	-0.236	0.122	0.010	-0.007
Q29	0.173	0.131	-0.028	0.071	0.226	0.220	0.334	0.066	0.667	0.015	0.078	-0.176	0.066	-0.080
Q17	0.164	0.074	0.162	0.002	0.018	0.080	0.221	0.194	0.625	0.035	0.257	0.125	0.047	0.033
Q51	0.096	0.181	-0.014	0.204	0.154	0.140	0.233	0.420	0.510	-0.200	-0.092	-0.071	0.140	0.013
Q63	0.176	0.305	0.150	0.137	0.261	0.173	0.241	0.085	0.503	0.032	0.077	0.019	-0.082	-0.191
Q9	0.164	0.192	0.282	0.108	0.066	0.067	0.061	-0.029	0.039	0.748	0.140	-0.103	-0.015	0.225
Q7	0.156	0.242	0.196	0.110	0.010	-0.016	0.193	-0.099	-0.007	0.632	0.008	0.273	0.064	-0.242
Q8	0.191	0.374	0.330	0.130	0.161	-0.120	0.093	-0.013	0.191	0.536	-0.032	0.170	0.090	-0.053
Q20	0.169	0.342	0.284	0.185	0.059	-0.112	-0.022	0.023	0.313	0.127	-0.018	0.060	0.564	0.055
Q50	-0.009	-0.013	0.205	0.296	0.197	0.112	0.294	0.210	0.030	0.215	0.033	0.129	0.423	-0.165
Q21	0.180	0.402	0.316	0.128	-0.049	0.190	0.017	0.066	0.094	0.490	0.044	-0.012	0.289	0.148
Q33	0.106	0.496	0.300	0.003	0.122	0.185	0.212	0.041	-0.139	0.360	0.038	-0.039	0.264	0.240
Q30	0.068	0.144	0.315	-0.037	0.224	0.090	0.454	0.269	0.160	-0.245	-0.111	0.146	0.205	0.014
Q18	0.180	0.057	0.141	0.040	0.217	0.045	0.460	-0.002	0.244	0.115	-0.031	0.339	0.121	0.234
Q19	0.151	0.440	0.462	0.232	0.096	0.047	0.155	-0.068	0.167	0.199	0.102	0.131	0.119	0.227
Q65	0.337	0.217	-0.039	0.204	0.134	0.465	0.181	0.084	0.154	0.176	0.215	-0.069	0.054	0.023
Q15	-0.224	-0.079	-0.086	-0.064	0.107	0.033	0.112	0.228	0.071	-0.087	-0.825	-0.045	0.013	-0.017
Q27	-0.119	0.022	-0.143	0.043	0.031	-0.016	-0.034	0.347	0.055	-0.060	0.011	-0.013	-0.006	-0.724
Q3	-0.202	-0.024	-0.151	-0.182	0.071	0.022	0.079	0.267	-0.044	-0.036	-0.778	0.010	-0.040	0.031
Q6	0.060	0.101	0.293	0.122	0.073	-0.082	0.278	0.263	0.325	0.192	-0.058	0.346	-0.152	0.236
Q40	-0.158	0.042	0.324	-0.093	0.204	0.026	0.309	0.467	0.035	0.070	-0.048	0.229	-0.374	0.056

Note: Factor loadings ≥ 0.5 are in boldface. Rotation converged in 14 iterations.