EXAMINING PREDICTIVE VALIDITY OF FIT-CHOICE SCALE IN JAPANESE UNDERGRADUATES

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Abstract - The present paper examined predictive validity of FIT-Choice Scale in Japanese undergraduates. The inventory has been a reliable assessment tool to measure teaching motivation in many parts of the world. Structural Equation Modeling was adapted to examine the theoretically assumed three-layer model of FIT-Choice Scale. Participants were 244 undergraduates who enrolled in a teacher education program at a regional national university in Japan. With some model revision, it is found that a three-layer model is fairly fit to the dataset, although only three factors was included out of 17 original FIT-Choice factors. The present study offers one more piece of evidence of validity of FIT-Choice Scale in Japanese population.

Index Terms - Teaching Motivation, Undergraduates, Teacher Education, Predictive Validity

I. INTRODUCTION

A. Needs to measure teaching motivation

Research on teaching career development has been attracted a number of scholars in many parts of the world. A recent trend in the area is shedding light on motivations of teacher candidates to choose a teaching career and factors to explain their retention.In Japan, career decision making process for teaching positions are becoming more important topic among educational researchers,due to a change in the direction of teacher education policy in college level. The restructuring of the teacher education programs in Japan is now deriving needs for systematic studies on teaching motivation. The authors have decided to start a series of studies to measure teaching motivation and related constructs of Japanese teacher candidates using questionnaire method. However, as far as we know, there was no relevant questionnaire to measure teaching motivation, with which Japanese respondents can complete their own language. A primary step toward the ends was to employing a relevant measurement tool for teaching motivation.

B. FIT-Choice Scale

As a measure for teaching motivation, we chose FIT-Choice Scale, which was developed by Richardson and Watt (2006) [1] and Watt & Richardson (2007) [2]. The scale has been administered to a considerable number of samples in many countries: Australia (Watt et al., 2012 [3]), USA (Watt et al., 2012 [3]; Watt, Richardson & Wilkins, 2014 [4]), Germany (Watt et al., 2012 [3]), Norway (Watt et al., 2012 [3]), Turkey (Kilinç, Watt & Richardson, 2012 [5]), Croatia (Marušić, Ivanec & Vidović, 2012 [6]) and Netherlands (Fokkens-Bruinsma & Canrinus, 2012 [7]). Its usage coverage is still spreading to other countries. The inventory theoretically assumes a three-layer model, which explain the relationship among the groups of factors[1]. As a first layer, Prior Teaching and Learning, Social Influences, and Social Dissuasion are conceptualized as primary factors of the model. These factors are thought to affect the secondary factors as follows: Ability, Intrinsic Career Value, Fallback Career, Job Security, Time for Family, Job Transferability, Shape Future of Children, Enhance Social Equity, Make Social Contribution, and Work with Children. Then these secondary factors are thought to explain students' decision to choose teaching careers.

C. Objective

The articles, which previously examined scale validity of the FIT-Choice Scale, have only deal with the correlation with "satisfaction with choice" factor (Watt & Richardson, 2007) [2]. This factor measures how a respondent feel satisfied with his/her decision to become a teacher. However, "satisfaction with choice" does not equal actual choice of teaching profession after students' graduation. We would like to extend the validity examination to the predictive validity of the FIT-Choice Scale. The present study examines the extent the FIT-Choice scale's factors predict actual choice to enter a teaching profession. The aim of the present study is to examine predictive validity of FIT-Choice Scale in Japanese undergraduates. If students' responses could predict their actual decisions to become teachers and if we confirm the three-layer structure of the scale, theresearch result would be considered as anpiece of evidence to demonstrate predictive validity of the scales.

II. METHOD

A. Instrument

In the previous study, Tomida (2016) [8] translated the original FIT-Choice Scale, which was published by Richardson and Watt (2006) [1], into Japanese with back translation procedure. Other data than FIT-Choice Scale such as examination participation for teaching position were obtained from a database to keep students' record of the target university.

B. Participants

Undergraduate students, who enrolled in a teacher education program of a regional national university in south west Japan, participated a survey research. FIT-Choice Scale was a part of the research. For the present study, responses from the students who entered the university in 2012 April (N = 133) and 2013 April (N = 132). They completed their FIT-Choice Scale when they were sophomore. The students of 2012 entrance respondedto the scalesin July 2013. The others did in May 2014. Out of the total respondents, 122 students of 2012 entrance and 122 of 2013 entrance. In total, 244 students' responses were examined.

C. Analysis

In order to examine the predictive validity of the scale, we adapted structural equation modeling method. For statistical computation, we used the 'lavaan' package version 0.6-1 of R, which was authored by Rosseel (2012) [9]. We mainly examined two measures of goodness-of-fit: CFI (Comparative Fit Index) and RMSEA (Root Mean Square Error of Approximation). We assumed that CFI >= .900 and RMSEA < .050 indicates a good fit in the present study. In addition, AIC (Akaike's Information Criterion) was referred to compare models. Less AIC value indicates better fit.

III. RESULT

Criterion variable is a dummy binary data, in which 0 means that the student did not take any teacher employment examinations, and 1 means that the student took teacher employment examination at least once. It is not plausible that all theoretically assumed factors in FIT-Choice would have significant relationshipsas in the model. Before an equation model is formulated, we computed a matrix of correlation coefficients between variables of FIT-Choice and the criterion variable as shown in Table 1, in which statistically significant coefficients of 1 % level are shown in bold. Relationships which showed the statistical significance were selected to formulate a preliminary equation modeling to predict the students' application to the examination. In Table 1, it is found that Intrinsic Career Value, Fallback Career, and Work with Children are correlated with Examination Participation among the second-layer factors. Among the factors of the first layer of the theoretical model, Prior Teaching and Learning significantly correlates with Intrinsic Career Value, Fallback Career, and Work with Children. Social Influences significantly correlate with intrinsic Career Value. And Social Dissuasion does not have any significant correlation with factors of the second layer. Therefore, the preliminary model included the factors, which had significant variables explained above. Covariance is also addedto the preliminary model, based on correlational relationshipswhich were observed between the explanatory variables. Calculated goodness-of-fit indices suggest that further improvement is required for the preliminary model ($\chi 2$ (df = 4, N = 244) = 12.559, p = .014, RMSEA = .094, CFI = .948, AIC = 4311.679). Although CFI value is high enough, RMSEA is notin the acceptable zone. To revise the preliminary model, we removed statistically insignificant relationships from it. The revised model is shown in Figure 1. The fit indices of the revised model demonstrate much better fit to the dataset ($\chi 2$ (df = 1, N = 244) = 1.195, p = .274, RMSEA = .028, CFI = .998, AIC = 2740.318).

Table 1: Correlation relationship between variables of FIT-Choice and criterion

	Exam	Ability	Intrinsic	Fallback	Security	Family	Transfer	Future	Equity	Contribution	Children	Demand	Expert	Status	Salary	Experience	Social	Dissuasion
Exam Particiaption		.143	**.256**	**-.188**	.049	.130	.011	.039	.025	-.032	**.281**	-.050	.025	.068	.146	.070	-.001	-.074
Ability	.143		**.392**	-.015	**.237**	**.289**	**.245**	**.405**	**.321**	**.331**	.096	-.051	.028	**.264**	.108	**.376**	**.476**	-.041
Intrinsic Career Value	**.256**	**.392**		**-.361**	.110	-.054	.059	**.381**	**.191**	**.304**	**.300**	.089	.120	.153	.060	**.460**	**.184**	-.083
Fallback Career	**-.188**	-.015	**-.361**		**.177**	**.319**	**.258**	**-.171**	.039	-.068	**-.173**	**-.171**	-.079	-.072	.065	**-.210**	.137	.127
Job Security	.049	**.237**	.110	**.177**		**.345**	**.460**	**.238**	.141	**.223**	**.230**	.092	.087	**.259**	**.370**	**.199**	**.246**	.069
Time for Family	.130	**.289**	-.054	**.319**	**.345**		**.443**	.088	.165	.103	.045	**-.183**	-.049	.068	**.199**	.034	**.423**	.070
Job Transferability	.011	**.245**	.059	**.258**	**.460**	**.443**		**.187**	**.274**	**.334**	**.165**	-.089	.054	.165	**.192**	.114	**.340**	.118
Shape Future of Children	.039	**.405**	**.381**	**-.171**	**.238**	.088	**.187**		**.509**	**.660**	**.228**	**.187**	**.182**	**.293**	.117	**.496**	**.186**	.075
Enhance Social Equity	.025	**.321**	**.191**	.039	.141	**.165**	**.274**	**.509**		**.610**	.080	.081	.093	**.206**	.045	**.312**	**.219**	**.228**
Make Social Contribution	-.032	**.331**	**.304**	-.068	**.223**	.103	**.334**	**.660**	**.610**		**.170**	.113	.148	**.352**	**.185**	**.437**	**.286**	.164
Work with Children	**.281**	.096	**.300**	**-.173**	**.230**	.045	.165	**.228**	.080	**.170**		.096	.101	.105	**.239**	**.180**	.053	-.143
Task Demand: Difficulty	-.050	-.051	.089	**-.171**	.092	**-.183**	-.089	**.187**	.081	.113	.096		**.315**	.107	.025	.103	-.126	.053
Task Demand: Expertise	.025	.028	.120	-.079	.087	-.049	.054	**.182**	.093	.148	.101	**.315**		**.323**	.075	.104	-.078	.045
Social Status	.068	**.264**	.153	-.072	**.259**	.068	.165	**.293**	**.206**	**.352**	.105	.107	**.323**		**.319**	**.235**	.110	-.020
Good Salary	.146	.108	.060	.065	**.370**	**.199**	**.192**	.117	.045	**.185**	**.239**	.025	.075	**.319**		.050	.064	-.058
Prior Teaching and Learning	.070	**.376**	**.460**	**-.210**	**.199**	.034	.114	**.496**	**.312**	**.437**	**.180**	.103	.104	**.235**	.050		**.229**	.099
Social Influences	-.001	**.476**	**.184**	.137	**.246**	**.423**	**.340**	**.186**	**.219**	**.286**	.053	-.126	-.078	.110	.064	**.229**		-.063
Social Dissuasion	-.074	-.041	-.083	.127	.069	.070	.118	.075	**.228**	.164	-.143	.053	.045	-.020	-.058	.099	-.063	

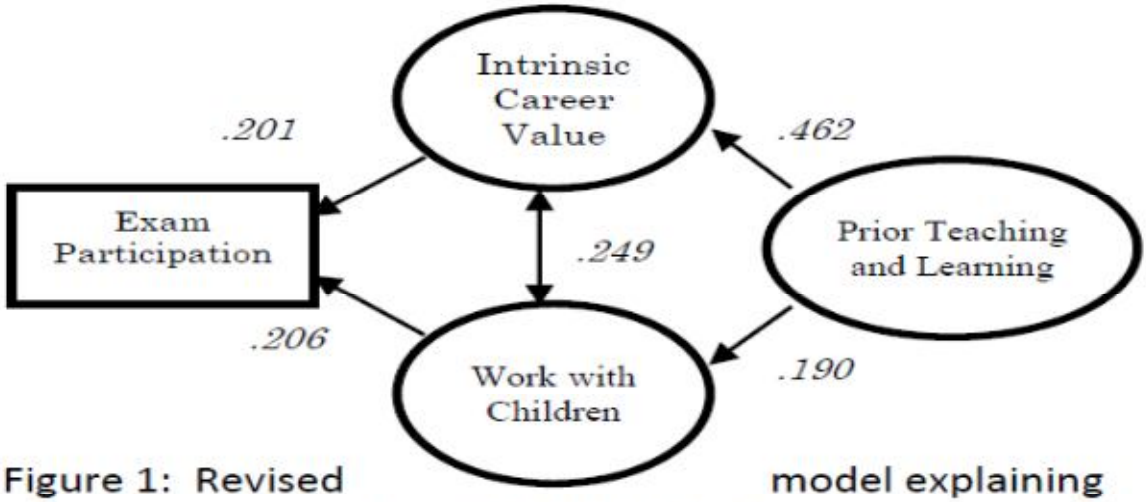


Figure 1: Revised model explaining exam participation

CONCLUSION

It is found that Intrinsic Career Value and Work with Children directly predict Exam Participation. Prior Teaching and Learning indirectly predict students' teaching career decision through Intrinsic Career Value and Work with Children. The three-layer structure, which was originally conceived by the Richardson and Watt (2006) is supported by the present dataset collected from Japanese teacher candidates. A limitation of the predictive validation examined in the present paper is that the structural equation model used for the validation covers only part of the whole factor list of FIT-Choice Scale. Still,prediction with fewer variables has practical advantage in application of the inventory, since a student can complete a questionnaire in shorter time. Obviously, the present study investigated only one institution for the predictive validity. It is needed to examine it at different universities to generalize the result of the study. It is indicated that even in the early stage of teacher education program, responses of FIT-Choice Scale can be used to predict their later decision for teaching career. In further studies, when we pursuit the more accurate prediction of teaching career, we could find better combination of variables usingprediction methods such as machine learning.

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