

Construct Validation of Teacher Efficacy in Teaching Arabic Scale

A Co-Variance Based Approach

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Abstract—The first attempt of this study is to investigate teacher efficacy construct. In so doing, this study tries to develop the extent to which the conceptualized teacher measure reproduces the data. Second, this study evaluates the adequacy of the teacher efficacy measure across teacher's place of graduation. The data were collected from adopted version of Teachers' Sense of Efficacy Scale administered to 252 teachers of National Religious Secondary School in Malaysia. The results of confirmatory factor analysis supported the adequacy of teacher efficacy measure and found that teacher is a multidimensional construct with four underlying dimensions. The model also found to be applicable across teacher's place of graduation

Keywords— Teacher efficacy; National Religious Secondary School; CFA

I. Introduction

Teachers are direct practitioners of educational theories and principles. They are seriously and directly involved with a variety of teaching and learning activities and have a principal role in determining what is required and what best for their students. Therefore, it is crucial to understand teachers' perceptions and views [1]. Teachers' belief about their own capabilities and ability is known as teacher efficacy. Teacher efficacy is an essential construct in teaching and learning. Researchers in education have recognized that teacher efficacy has strong relationship with various aspects of teaching and learning [2, 3]

Teacher efficacy as defined by Berman [4] is a teacher's judgment of his or her abilities in achieving the desired results of student engagement and learning, even though there are some students who are having difficulties and are not motivated. or as "the teacher's conviction that his or her teaching meet the expectation and can influence student learning [5].

High efficacious teachers are able to face and master challenging tasks. They enhance and support their efforts to deal with failure and quickly rehabilitate their sense of efficacy after failure or hindrances. They can positively influence student attainment despite a possible challenging situation (such as students who come from low status economy parents or a shortage of resources). They believe that unmotivated students are teachable if teachers devote extra effort. In contrast, low efficacious teacher will avoid difficult or challenging tasks which they notice as personal menaces. They have weak commitments and are not able to pursue the goals. When encountering the obstacles, they loosen their efforts and quickly surrender and are not able to concentrate on how to accomplish the tasks successfully. They believe that they have inadequate capability to affect student learning and attainment. They also believe that student performance is outside their control and students' success depends on the external environment, there is little effort they can do to teach difficult students and prepare to improve student learning.

Teacher efficacy researches have been widely examined by many researchers in various context and subject areas. For instant, it has been explored in the science education field [6, 7, 8], mathematic [9], physical education [10]. and Teaching English to Speakers of Other Languages (TESOL) [11, 12]. However, in the field of Teaching Arabic as a Foreign Language (TAFL), the investigation into teacher efficacy and its relation to teacher commitment is extremely scarce. Therefore, it is crucial to pursue this line of investigation into the field. Thus, this study aims at empirically examining the probability of a four-common-factor structure of teacher efficacy. The study sought to determine the extent to which the conceptualized teacher efficacy measure reproduced the data. Secondly, the study measured the adequacy of the teacher efficacy measure across teacher's place of graduation.

II. Theoretical Framework

This study is based on social cognitive theory. Social cognitive theory presents a framework for understanding and foreseeing changes in human behaviour. This theory highlights that cognition plays an essential role in a person's capability to construct reality, self-regulate, encode information and perform behaviours [13].

Bandura [14], a father of social cognitive theory put forward a view of human functioning which stresses human agency. According to Bandura [16], agency is referred as any action done intentionally. A person is not considered as the agent of the event if he did something accidentally. For example, a person who destroyed a set of displayed dishes in a restaurant upon being tripped by another customer would not be considered the agent of the event. In social cognitive

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theory, people are active agents and “contributors to, rather than the sole determiners of, what happens to them” [15, p. 3]. Social cognitive theory explains how people attain and sustain certain behavioural patterns because human agency is developed by interacting with others. A baby is born without any personal agency, but he or she may interact with the environment and people after developing a sense of agency. People acquire knowledge by noticing the actions and reinforcement of others, especially others who they identify with. In other word, people usually pay attention to the attractive, popular or respected person. For instant, a child will refer to his/her mother, or older sister or brother.

Human agency must be elucidated “within an interdependent causal structure involving triadic reciprocal causation” model [16, p. 6]. In this reciprocal causation model as shown in figure 3-1 personal factor (cognitive), behavioural and environmental influences all operate as interacting determinants that influence each other bidirectionally through a process of reciprocal determinism. Therefore, “human functioning is viewed as the product of a dynamic interplay of personal, behavioural and environmental influences” [13, p. 1].

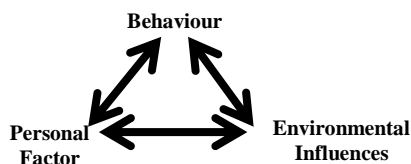


Figure 1: Triadic Reciprocal Causation Model [15, p. 6]

It is interesting to note that reciprocal causation does not necessarily have the equal strength between the sources of influence. Some may be stronger than others and the reciprocal influences may not happen concurrently. Furthermore, according to Davis and Luthans [17], personal factors contain the features that employees or teachers bring with them to the workplace; while environmental influence comprise influences encountered at the workplace. Thus, it is useful to investigate reciprocal relationships between teacher self-efficacy and the context of school.

In the classroom context, teachers work to enhance student achievement. Social cognitive theory proposes that teachers’ efficacy belief and behaviour cannot be fully understood solely of the school environment. Teachers spent a large portion of their work within the classroom, they work within a social system, collaborate with other teachers, students, and administrators.

iii. Method

A. Sample

The study employed a stratified random sample of 252 teachers from Malaysian Religious Secondary School Teachers consisting of 100 (39.7%) male and 152 (60.3%) female teachers, 7.93% of the respondents have masters’ degree and the rest of the respondents have first degrees as the highest qualification. More than half of the respondents have more 10 years teaching experience and graduated from oversea universities.

B. Instrument

Teacher efficacy instrument is adapted from Teachers’ Sense of Efficacy Scale (TSES) by Tschannen-Moran & Woolfolk Hoy [3] with some modification to be suited with the Arabic teaching context in Malaysia. There are three constructs produced by TSES and a new construct with 9 items are added for the study and there will be a need to re-establish the validity of the instruments. Respondents are required to rate the statements on a seven-point likert scale, ranging from *not at all* to *always*.

iv. Findings

A. Evaluation of the CFA Model

The hypothesised 4-factor measurement model was measured by employing confirmatory factor analysis with AMOS (version 22) to evaluate the factorial validity of the CFA model. Teacher efficacy has four (4) underlying dimensions; efficacy for language use (ELU), efficacy for classroom management (ECM), efficacy for teaching strategies (ETS) and efficacy for student engagement (SES). The dimension of efficacy for language use has nine (9) indicators, efficacy for classroom management and efficacy for student engagement has five (5) indicators each, whereas efficacy for teaching strategies has six (6) indicators.

The CFA model showed a poor model fit for the four dimensions with 25 indicators. The normed chi-square ($\chi^2/df = 3.488$) falls beyond the acceptable range of ≤ 3 [18]. Further, the other fit indices were also found to have insufficient value. The GFI = .720, and CFI = .856 fall below the cut-off point of $\geq .90$ and RMSEA = .106 is far above the threshold value of ≤ 0.08 . Investigation of standardized residual covariance shows that several items have excessively high values. Therefore, the decision was made to drop items that have standardized residuals covariance bigger than 10 and the CFA model of teacher efficacy was re-specified.

Out of six items from *ELU*, four items were removed. Similarly, two items were removed from *ETS* and *ESE* and one item was removed from *ECM*. Overall, out of 25 items, 11 items were removed to obtain model fit.

The overall modification model indicates a better goodness of fit indices which was compatible with the data. Table 1 summaries the result of the fit indices and compares the recommended cut-off point against the generated model and revised model.

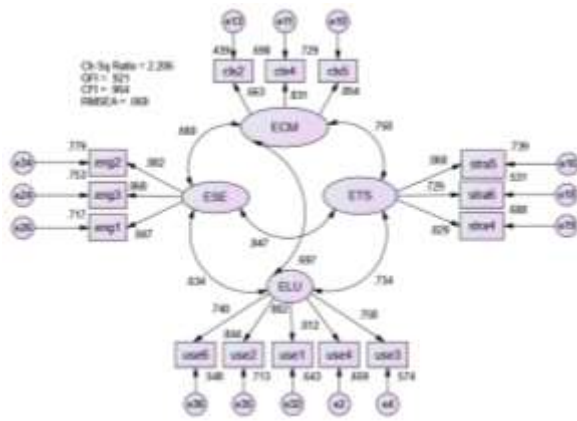


Figure 2: The Revised CFA Model of Teacher Efficacy

Based on Fig. 2 and Table 1, the normed chi-square (χ^2/df) = 2.206, and RMSEA = .069, fall within the acceptable range of ≤ 3 and $\leq .08$ respectively indicating a good model fit of the revised model. The other fit indices were also found to have sufficient value indicating a good model fit. The GFI = .921 and CFI = .964 were above the cut-off value of $\geq .90$. Furthermore, the inter-correlation between the dimensions is below 0.87, indicating good discriminant validity.

TABLE IV: SUMMARY OF THE FIT INDICES OF THE MULTIDIMENSIONAL CONSTRUCTS OF TEACHER SENSE OF EFFICACY (TSE)

Fit Indices	Accepted Fit	TSE Generated Model	TSE Revised Model
CMIN/DF	≤ 3	3.488	2.339
GFI	$\geq .90$.720	.908
CFI	$\geq .90$.856	.950
RMSEA	$\leq .08$.106	.078

Further analysis is needed to examine the internal reliability and convergent validity of the model. Table 2 summarizes the internal reliability and convergent validity for the revised model of TSE.

TABLE 1: IV: SUMMARY OF THE INTERNAL RELIABILITY AND CONVERGENT VALIDITY FOR THE REVISED MODEL OF TEACHER SENSE OF EFFICACY

Construct	Item	Convergent Validity			
		IR ^a	Factor Loading	CR ^a	AVE ^b
Classroom Management	Classroom 2	.814	0.655	0.829	0.622
	Classroom 4		0.827		
	Classroom 5		0.867		
Instructional Strategies	Strategies 4	.836	0.814	0.850	0.655
	Strategies 5		0.870		
	Strategies 6		0.738		
Language Use	Use 1	.889	.796	0.892	0.622
	Use 2		.839		
	Use 3		.758		
	Use 4		.812		
	Use 6		.735		
Student Engagement	Engagement 1	.853	.752	0.861	0.675
	Engagement 2		.887		
	Engagement 3		.821		

Note:

^a Composite reliability (CR) = (square of the summation of the factor loadings) / ((square of the summation of the factor loadings) + (square of the summation of the error variances))

^b Average Variance Extracted (AVE) = (summation of the square of the factor loadings) / ((summation of the square of the factor loadings) + (summation of the error variances))

FL=Factor Loadings, IR=Internal Reliability, α =Cronbach's Alpha

As can be seen from Table 2, all the composite reliability values are above 0.70 and the average variance extracted (AVE) is all above 0.50. Therefore, the CFA model of teacher efficacy has the proof of internal reliability and convergent validity. Therefore, it can be concluded that convergent validity and internal reliability for the revised model of teacher efficacy have been established. Based on the fit indices, internal reliability and convergent validity of the revised model of teacher efficacy, the analysis showed that the construct of teacher efficacy are valid and reliable.

B. Invariance of TSE Measure

The measurement model was further tested for teacher's place of graduation-invariant through a three-stage multi-group analysis. This would enhance the psychometric properties of the measurement model. Firstly, a concurrent analysis was conducted on both local universities and oversea universities samples, with unrestricted loadings that represent a baseline model. Subsequently, all loadings were restricted or constrained to be similar for both the local universities and oversea universities groups. This constrained model of TSE produced a different chi-square value. This new chi-square value from the constrained model was finally tested against the chi-square value of the baseline model to determine the significant differences.

The invariance analysis across teacher's place of graduation resulted in a statistically insignificant change in the chi-square value, $\chi^2(87) = 114.69, p > .01$; this implied that the constrained model did not get worst-off, given the equality constraints. In other words, the loadings did not differ significantly across teacher's place of graduation. By virtue of the invariance analysis, the measurement model of teacher efficacy behaved equally with regards to the teachers who graduated from local universities and teachers who graduated from oversea universities samples is not a moderating variable. Hence, the invariance analysis rather enhances the psychometric properties of teacher efficacy measurement model.

v. Discussion and Conclusion

This study was conducted to assess the reliability and validity of the teachers' sense of efficacy inventory by applying confirmatory factor analysis to a Malaysian case. The results of the CFA provide support for a four-factor model of teacher efficacy consisting of efficacy for language use, efficacy for classroom management, efficacy for student engagement and efficacy for teaching strategies. Results suggest that the four-factor model was the best overall fit to the data. It is apparent that, the efficacy for language use dimension is represented by five indicators related to teaching listening skill, speaking skill, reading skill, writing skill and using Arabic language to communicate with students. The efficacy for classroom management is represented by three indicators which are controlling disruptive behaviour in my Arabic class, preparing classroom activities to attract student interest and making Arabic class enjoyable. The efficacy for teaching strategies dimension is explained by three indicators namely giving explanation and relevant example, preparing challenging assignment, and diversifying activities and exercises to enhance students in mastering Arabic language.

The efficacy for student engagement dimension is signified by three indicators namely motivating students who show low interest, convincing students, explaining students the benefits of learning Arabic.

Since this is one of the early attempts to establish the psychometric properties of teachers' sense of efficacy in teaching Arabic in Malaysia context, the study is restricted in terms of its generalizability. The study was conducted in National Religious Secondary Schools involving rather a small sample size. Thus, further inquiry is required to validate the instrument with teachers from other types of school (i.e government assisted schools, religious secondary schools, private religious schools etc) and with a bigger sample which would allow more generalizable results.

Examining teacher efficacy could be a powerful tool to understand and improve teacher self-competency. While it is understood that efficacy is a future-oriented judgment that has to do with the teacher's perception of competence rather than actual level of competence. It could be inferred that slightly overestimating one's actual capabilities that might have a positive effect on performance. On the other hand, Bandura's self-efficacy theory does suggest means for influencing efficacy beliefs, and teacher educators might attempt to use these in their training. In view of the potential fruitfulness of teacher efficacy research for teacher education, it is time for Malaysian educators to rise to the challenge of conducting teacher efficacy research to accommodate and evaluate the changes introduced by waves of education reforms in this decade.

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