

Research Article

The Study of Teacher Efficacy in Hong Kong Sub-Degree Sector

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Introduction. Sub-degree sector is rising in Hong Kong. The number of enrolled students was over 50000 in 2011. Students' characteristics and teachers' roles in the sub-degree sector are different from other sectors. It was important to investigate the factors related with teacher efficacy of sub-degree teachers. *Method.* Sixty sub-degree teachers were surveyed, and 58 of them were valid (33 males and 25 females). The questionnaire contained three teacher efficacy scales: Teacher Efficacy Scale (TES) (short form), Bandura's Instrument Teacher Self-Efficacy Scale (TSES), and Teachers' Sense of Efficacy Scale (TSoES) and an instrument of self-rating's levels of concerns. *Results.* The teacher efficacy scales were found to be reliable in the sub-degree sector. The levels of education and educational trainings were not found to be related with any teacher efficacy scales. Level of concerns of teacher efficacy was found to be significant related with TSES' efficacy to influence parental involvement and TSoES's instruction strategies. *Conclusion.* This study found that educational trainings and levels of educations were not related with teacher efficacy and could persuade institutes not to view educational backgrounds as the most influencing factor in employment selections and design better staff developments instead of only sponsoring teachers to pursue further studies.

1. Introduction

In 1999, Hong Kong Education Bureau (HKEB) published the "Review of education system: Framework for education reform" to review the academic system and urged to engage full-time post-secondary colleges (i.e., institutes providing postsecondary courses and compensatory courses into life-long learning academic structure) into the system. It meant that students who graduated from secondary education can choose to continue their studies in either full-time postsecondary colleges or universities. Those post-secondary colleges are different from vocational training bodies and universities as they provide more academic-oriented and less vocational-oriented programs (e.g., diplomas, higher diplomas, Project Yin Jin, and associate degrees) which are qualified as lower level than bachelor degree level. Those programs prepare students to pursue degree programs after graduation. Those institutes formed a new sector called subdegree sector which is different from "Technical Vocational Education and Training" (TVET) comprised of vocational training bodies and "Higher Education" comprised

of universities. "Sub-degree" was defined as the comprising of both "the Higher Diploma of a vocational character and the Associate Degree, which is generally of a more academic nature" [1, page 30]. In 2000, HKEB published a consultation paper "Review of Education System Reform Proposals" which emphasized the importance of the sub-degree sector. In the past 10 years, Hong Kong government has given a lot of support such as interest-free loans and other subsidies to facilitate the development of the sub-degree sector [1]. Currently, there are 28 institutes providing sub-degree programs. The number of higher diploma and associate degree rose from 38 in 2001 to 311 in 2011. The number of students rose from 8895 in 2001 to 51796 [2]. The sub-degree sector became important in Hong Kong education. More and more teachers are serving in the sub-degree sector. Sub-degree teachers are assigned with both teaching duties and administrative activities such as student recruitment, programme development, and quality assurance. Some teachers do even participate in research activities. Teachers in the sub-degree sector had several roles and came from different backgrounds such as business world

and owned certain professional qualifications such as social workers, accountants, and nurses. Programs in sub-degree sector are required to be validated by Quality Assurance Committee [1]. Student learning performance is one of the key components in the validation. Some sub-degree teachers have not received educational trainings before joining the education sector. Most sub-degree institutes would provide staff development funds for their teachers to enhance teaching performance. Joyce and Showers [3] commented that trainings far from normal teaching environment could improve less than 5% instructional practices in the classroom. Teacher efficacy has long been viewed as one of the most important factors in student learning [4, 5]. Marzano [6] conducted a meta-analysis and found that effective and engaging teachers would significantly improve student achievements no matter the students' academic backgrounds. Most effective and engaging teachers would have an impact on student achievement 39 percentages larger than least effective and engaging teachers. This paper tried to study teacher efficacy of sub-degree teachers.

Teacher efficacy is defined as "the judgment of his or her capabilities to bring about desired outcomes of student engagement and learning" [7, page 783]. Teacher efficacy is one of few teachers' characteristics consistently linked with teaching and learning [4, 5]. The construct of teacher efficacy was firstly introduced by RAND Corporation [8] and developed with Rotter's [9] Locus of Control. Two dimensions of the construct are general teaching efficacy, the belief in the power of teaching to achieve results in the classroom and personal teaching and the belief in personal ability to achieve results [10]. In the RAND studies, the sum of two dimensions was the teacher efficacy. There was a debate whether teacher efficacy was unidimensional or multi-dimensional. Nowadays, due to complexity of teaching activities, teacher efficacy is always considered as multidimensional instead of unidimensional [7, 11].

The other perspective in teacher efficacy was developed by Bandura [12] with social cognitive theory. Social cognitive theory assumed that people expectations but not consequences are the main causes of the behavior. Expectations are influenced by observations, persuasion, and physiological arousal as well as the consequences of prior experiences [13]. One's belief in his/her capabilities to execute tasks or manage situations was influenced by mastery experiences, vicarious experiences, social persuasion and physiological or emotional feedback [14]. Teacher efficacy is the self-efficacy that teachers perceive their capability in teaching. Bandura [12] argued that teacher efficacy should be efficacy expectation instead of outcome expectations. Efficacy expectation is "the conviction that can successfully execute the behaviors required to produce the outcome" (page 193), and outcome expectations depends on the outcomes of the behaviors [15]. Bandura [12] stated that efficacy expectation should be situation specific and not a generalized expectancy. Bandura [12] further developed an instrument to measure teacher efficacy containing seven dimensions: efficacy to influence decision making, efficacy to influence social resources, instructional efficacy, disciplinary efficacy, efficacy to enlist parental involvement, efficacy to enlist

community involvement, and efficacy to create a positive school climate.

Teachers' sense of efficacy has been shown to be positively correlated with effective student achievement [16, 17] and positive classroom management [14]. Tschannen-Moran and Hoy [7] developed Teachers Sense of Efficacy Scale (TSES) to measure three distinct but related factors on teacher efficacy: efficacy for classroom management, efficacy for student engagement, and efficacy for instructional strategies. TSES was one of the prevailing measures in teacher efficacy [11]. Because self-efficacy is context specific, teacher efficacy studies have been carried out in a lot of different teaching environments such as primary, secondary, and special education schools to both preservice and inservice teachers. Compared with primary and secondary schools, teachers in the sub-degree sector act dual roles of teachers and administrators. The roles of administrators were found to enhance teacher efficacy [18]. Lin and Gorrell [19] also suggested that the construct of teacher efficacy was very subject to the beliefs about the roles of teachers. There was a need to study teacher efficacy in the sub-degree sector. A meta-analysis of 218 teacher efficacy studies from 1998 to 2009 covered teachers of different levels and in different regions. However, no one was classified as post-secondary level [20].

Both outcome expectations and efficacy expectations were found to be correlated in certain extent [21]. Visser-Wijnveen et al. [21] proposed that teacher efficacy teacher efficacy shall contain personal efficacy, teaching efficacy and outcome efficacy. In each dimension, both general and contextual aspects should be considered together. Therefore, three teacher efficacy scales would be used to measure teacher efficacy in both general and contextual aspects.

Dunn and Rakes [22] based on Fuller's (1969) [23] concern-based theory argued that concerns and self-efficacy were linked. McKinney et al. [24] also found that self-efficacy and expressed concerns were related. People with higher efficacy tended to have higher stages of concern. Tschannen-Moran et al. [25] also added the attitudes to different dimensions of teacher efficacy as weights in calculating the teacher efficacy. Weiner [26] stated that attitudes influence behavior. In the present study, self-rated concerns of different domains in teacher efficacy would also be measured.

There are some personal characteristics that would also affect teacher efficacy. Ross [27] found that more experienced teachers tended to have greater teacher efficacy. Similar results were found by other studies [4, 5, 28, 29]. Ross [27] also found that female teachers have higher senses of teacher efficacy than male counterparts. However, this finding was not supported by other studies [30, 31]. Therefore, the relationship between gender and teacher efficacy is still inconclusive.

There were three aims in the study. The first one was to test whether teacher efficacy scales were still reliable in the sub-degree sectors. The second one was to test whether levels of education and educational trainings could predict teacher efficacy. The third one was to investigate the relationship between concerns of teacher efficacy and teacher efficacy.

2. Method

2.1. Participants. Sixty teachers from the sub-degree sector were surveyed, and 58 of them were valid (men = 33; women = 25). They were recruited from three institutes and an education course for sub-degree teachers. As questionnaires were distributed in face, the return rate is 100%. Their teaching experiences were distributed as 0 to 1 year (10.3%), 2 to 3 years (27.6%), 4 to 5 years (25.9%), 6 to 7 years (8.6%), 8 to 9 years (5.2%), and 10 or over 10 years (22.4%). Most of them got a Masters degree (77.6%). Some of them even got a doctorate degree (13.8%) and rest of them only had a bachelor degree (8.6%).

2.2. Instruments. A self-report questionnaire with four sets was used for measurement: Teacher Efficacy Scale (Short Form) (TES; [32]), Bandura's Instrument Teacher Self-Efficacy Scale (TSES; [33]), Teachers' Sense of Efficacy Scale (TSoES, [7]) and self-rating importance of domains of teacher efficacy.

2.3. Teacher Efficacy Scale (TES). TES was firstly developed by RAND Corporation [8] based on the theory of locus of control, which consists of two items "When it comes right down to it, a teacher really cannot do much because most of a student's motivation and performance depends on his or her home environments" and "If I really try hard, I can get through to even the most difficult or unmotivated students" to measure both general teaching efficacy (GTE) and personal teaching efficacy (PTE). Gibson and Dembo [34] further extended these to a 30-item instrument in a 6-point Likert. Without significantly reducing reliability, Hoy and Woolfolk [32] developed a shorter version of TES with 10 items. In the present study, the short form of TES would be used.

2.4. Teachers' Self-Efficacy Scale (TSES). TSES was developed by Bandura (1997) [12] based on social cognitive theory and the construct of self-efficacy. In contrast with TES which measures efficacy expectation, TSES measures outcome expectancy. TES and TSES originated from two distinct conceptual frameworks on teacher efficacy [25]. TSES has 30 items to measure seven domains: efficacy to influence decision making, efficacy to influence social resources, instructional efficacy, disciplinary efficacy, efficacy to enlist parental involvement, efficacy to enlist community involvement, and efficacy to create a positive school climate. Each item was rated with a 7-point Likert scale.

2.5. Teacher Sense of Efficacy Scale (TSoES). TSoES was developed by Tschannen-Moran and Hoy [7]. It has both 24-item and 12-item short form instrument. Each item was rated with a 9-point Likert scale. TSoES measures teacher efficacy based on the roles of teachers and has three moderately correlated factors: efficacy in student engagement, efficacy in instructional practices, and efficacy in classroom management.

2.6. Self-Rated Importance of Domains in Teacher Efficacy. Based on the concerned-based theory from Fuller [23], teachers may be more willing to make a change or innovation when they are concerned with it. Measuring the teacher ratings of importance of various domains in teacher efficacy can help to understand teacher efficacy. Eleven domains were measured which are the subscales of three teaching efficacy scales in the questionnaire. Demographic information such as gender, teaching experience, teaching level, teaching area, education level, and educational training was also collected.

2.7. Procedure. Sixty sub-degree teachers were invited in a voluntary and anonymous basis to participate on this study. The designed questionnaire contained 5 parts and can be completed in 20 minutes. Participants can complete in site or in home. The aim of the study and confidentiality were informed before filling out the questionnaire. Fifty-eight of them were valid. One invalid case had a lot of missing items, and another invalid case provided a single response to all items. The processed data was analyzed with Statistical Package for the Social Sciences Version 19.0 (SPSS 19.0). After checking the reliability of the data with the Cronbach Alpha and Pearson correlation coefficients, univariate analysis of variances and hierarchical regression analyses were conducted to test the variables of the study.

3. Results

The results were organized based on the research questions. Firstly, the reliability of the data would be presented. Secondly, the relationship between different teacher efficacy scales would be reported. Finally, the predicting powers of both teachers' level of concerns on teacher efficacy and demographic information such as education level and teaching trainings on teacher efficacy were examined.

4. Reliability

All four scales were reliable and had good internal reliability. In TES, the Cronbach coefficients of GTE and PTE were good in the sample (.72 and .78, resp.). In TSES, the Cronbach alphas of all subscales are high ($.83 \leq \alpha$ s). In TSoES, Cronbach coefficients of three subscales: efficacy in student management, instructional strategies, and classroom management, were good (.74, .74, and .84, resp.). In self-rated importance, the Cronbach alpha was very good ($\alpha = .89$). Considering intrarelation among subscales, the correlation between GTE and PTE was insignificant ($r = .17$). It meant that two subscales in TES were not overlapping; the correlations between subscales in TSoES were highly significant ($.60 \leq r \leq .72, P_s < .001$). It meant that three subscales in TSoES shared a lot in the construct. In TSES, all 7 subscales were found to be intercorrelated with at least three other subscales. The instructional self-efficacy subscale was found to be significantly correlated with all other subscales ($.32 \leq r \leq .60, P_s < .05$).

4.1. Relationships between Teacher Efficacy Scales. All subscales, except TSES's efficacy to influence in school resources decision, was correlated with some other subscales. PTE were positively correlated with six subscales in TSES ($.29 \leq r \leq .50$, $P_s < .05$) and two scales in ToSES ($.36 \leq r \leq .53$, $P_s < .01$). Subscales of ToSES were also positively correlated with at least three subscales in TSES (see Table 1). As three teaching efficacy scales were significantly correlated, it meant that teaching efficacy scales derived from different theoretical frameworks were closely related.

4.2. Analyses of Variance. Both levels of education and educational trainings were the independent variable in univariate analyses. Different levels of education were found to be significantly different only in TSES's efficacy to influence parental involvement ($F = 3.49$, $P < .05$). Using Scheffe Method as a post hoc analysis, two homogenous subsets were formed. One subset was bachelor (Mean = 2.67) and master (Mean = 4.27). The other subset was master and doctorate (Mean = 5.29). It meant that teachers with higher levels of education tended to be more efficacious in involving parents. Educational trainings could not vary over any subscales of three teacher efficacies.

4.3. Regression Analysis. Hierarchical regression analyses were conducted to test whether levels of concerns of teacher efficacy could predict teacher efficacy. After controlling other variables, levels of concerns of teacher efficacy could positively predict TSES's Efficacy to enlist parental involvement and student discipline management and ToSES's instruction strategies efficacy. It meant that in some dimensions of teacher efficacy, levels of concerns played significant roles. Gender was found to significantly predict TSE's personal teacher efficacy and TSES' efficacy to enlist to parental involvement. Female teachers generally had higher personal teacher efficacy and higher efficacy in engaging parental involvement than male counterparts. Experience was found to positively predict TSES' efficacy to influence decision making (see Table 2).

5. Discussion

This paper is the research to study teacher efficacy in the sub-degree sector in Hong Kong. Visser-Wijnveen et al. [21] stated that most existing instruments were designed for secondary or primary school teachers. The student characteristics in sub-degree sectors were more different from traditional school sectors. Tournaki and Podell [35] commented that student characteristics would affect teacher sense of efficacy. Firstly, the present study proved that the internal consistencies of all three teacher efficacy scales were high in the study. All three scales also were found to be correlated. It seemed that teacher efficacy scales were reliable in the sub-degree sector. Validity tests could be conducted in the future studies.

Secondly, the levels of education and educational trainings were found to be almost not related with teacher efficacy in both ANOVA tests and regression analyses. Levels of

education were found to be only related with TSES's efficacy to enlist parental involvement. However, after controlling other variables, levels of education did not significantly predict TSES's efficacy to enlist parental involvement. The result contradicted to the finding from Hoy and Woolfolk [32] that educational level was the personal variable that predicted personal teacher efficacy. It challenged also the general view that people with higher level of education and educational trainings could have a stronger sense of teacher efficacy.

The levels of concerns were found to be significantly predicting TSES's efficacy to enlist parental involvement, TSES's student discipline management and ToSES's instruction strategies. This finding signified the importance of levels of concerns in predicting teacher efficacy, and this also supported that the inconclusive results in the studies related with the levels of concerns may be due to the choices of teacher efficacy. Different teacher efficacy scales focused on different domains of teacher efficacy. Some domains were more influenced by the levels of concerns and some were less, even though the causal link between concerns of teacher efficacy and teacher efficacy was not built, further intervention could be implemented to test whether any improvement in the concerns of teacher efficacy could enhance teacher efficacy. If the causal link was found, enhancing the concerns of teacher efficacy could be a way to improve teacher efficacy.

Lastly, gender was found to be associated with teacher efficacy. This finding was consistent with some other studies. However, Pas et al. [36] commented that most studies exploring the association between gender and teacher efficacy had relatively small sample sizes and included few male teachers [37, 38]. In the present study, the distribution between Male and Female teachers was quite fair (Male = 33; Female = 25).

5.1. Limitations. In the present study, the reliabilities of 3 teacher efficacy scales were studied. However, the validities of 3 teacher efficacy scales were not investigated. In the future study, some teaching outcomes can be measured together with invention to test the validity of teacher efficacy scales in the sub-degree sector. Moreover, no intervention was introduced and the causal link between teaching efficacy and consequence of teaching could not be established. Even though Hoy and Woolfolk [32] commented that most studies had assumed teaching efficacy as an independent variable in the link between efficacy and outcomes. According to Bandura's social cognitive theory, teacher efficacy could be enhanced through mastery learning, viscous learning, social persuasion, and physiological feedback. Giving some teaching trainings to teachers may enhance their sense of efficacy in teaching and teaching performance could be measured before and after-intervention. The samples size in the present study was quite small, and factor analyses have not been conducted. Using factor analyses can further test the number of dimensions of teacher efficacy in the sub-degree sector and can show a clearer picture of teacher efficacy. In the future study, a large sample size can help to develop a new teacher efficacy scale special for sub-degree sectors.

TABLE 1: Correlation between teacher efficacy scales.

TSES	TES		ToSES		
	GTE	PTE	Student engagement	Instructional strategies	Classroom management
Decision making	.08	.29*	.36**	.01	.10
School resources	.18	.23	.17	.12	.24
Instructional efficacy	.39**	.50***	.74***	.33*	.55***
Disciplinary efficacy	.28*	.35**	.53***	.45***	.83***
Parental involvement	.06	.46***	.58***	.13	.36**
Community involvement	-.07	.41**	.40**	.04	.12
Create a positive climate	.26	.50***	.70***	.31*	.52***
	TES	GTE	.38**	.19	.33*
		PTE	.53***	.12	.36**

Note: * $P < .05$, ** $P < .01$, *** $P < .001$.

TABLE 2: Hierarchal regression analysis on predicting variables of teacher efficacies.

	TSE				TSES				ToSES			
	a	b	c	d	e	f	g	h	i	j	k	l
	β	β	β	β	β	β	β	β	β	β	β	β
Gender	.17	.35	-.12	.08	.18	.08	.26	.20	.19	.21	.04	.11
Experience	.05	.12	.30*	.03	.12	.16	.27	.20	.07	.15	.10	.18
Education level	-.13	-.13	.22	1.9	.26	.15	-.01	-.12	.06	-.05	.02	-.09
Education training	.17	-.15	-.01	-.14	.10	.07	-.13	-.15	.04	.13	-.07	.04
ΔR^2	.07	.13	.18	.07	.16	.07	.12	.07	.05	.08	.01	.04
F value	0.88	1.87	2.77*	1.03	2.38	1.00	1.82	1.02	0.67	1.13	0.18	0.54
Gender	.18	.31*	-.12	.10	.24*	.10	.26	.21	.19	.19	.04	.09
Experience	.05	.08	.31*	.03	.16	.18	.27	.16	.05	.12	.07	.16
Education level	-.13	-.10	.23	.19	.15	.13	-.01	-.10	.06	-.04	.06	-.07
Education training	.17	-.13	-.01	-.14	.11	.04	-.13	-.08	.04	.12	-.06	.05
Level of concerns	.05	.17	.12	-.20	.46***	.24	.02	2.8*	.13	.22	.52***	.10
ΔR^2	.00	.03	.01	.04	.20	.06	.00	.07	.01	.05	.27	.01
F value	0.72	1.83	2.39	1.30	5.57***	1.50	1.44	1.76	0.70	1.48	3.95**	0.52

a: GTE, b: PTE, c: decision making, d: school resource, e: parental involvement, f: community involvement, g: instructional efficacy h: student discipline management, i: create a positive climate, j: student management, k: instruction strategies, and l: classroom management.

* $P < .05$, ** $P < .01$, *** $P < .001$.

6. Conclusion

This study investigated whether teachers with teaching trainings and higher education levels would have higher teacher efficacy. Currently, some institutes would only employ those processing doctorate degrees. Some institutes would also set up staff development funds to subsidize the academic staff to pursue further educations. The finding that teachers with teaching trainings and higher education levels would not have higher teacher efficacy may indicate that teaching trainings and higher education levels shall not be one of the assessment criteria in employment. Ingvarson et al. [39] analyzed 4 studies which included 3,250 teachers in Australia, who participated in various development activities and stated that teaching developments allowing participants to share personal teaching practices, evaluate student learning, and develop ideas collaboratively can significantly enhance the teacher efficacy. The finding of present study could

encourage institutes to use their staff development funds in an effective way not just supporting staffs to pursue further studies.

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