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How Do Teacher Affective and Cognitive Self-Concepts Predict Their Willingness to Teach Challenging Students?

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Abstract: Building on and extending earlier research on student self-concepts and studies investigating teachers working with students with social, emotional, or behavioural difficulties, disorders, or disturbance, this longitudinal study examined teacher self-concepts in relation to their willingness to teach challenging students in mainstream classrooms. In the current study, “challenging students” refer to those who may pose a challenge to the teacher, either behaviourally or academically. Statistical measures included analysis of variance, correlation analysis, path analysis, and commonality analysis. Survey data collected from 108 participants at three different time points consistently showed that affective self-concept was a stronger predictor than cognitive self-concept of teachers’ willingness to teach challenging students. This study affirms and extends self-concept research by showing that the affective dimension of teacher self-concept is a better predictor of choice indicators than the cognitive dimension. The study also highlights the importance of developing and sustaining a strong sense of professional enjoyment for teachers in facing challenging teaching environments.

Keywords: longitudinal study, teacher self-concept, teacher willingness, challenging students, teacher education

Introduction

Educational research has reflected that teachers are experiencing increasing challenges in the school environment. One common challenge is related to how students behave in class. Ball, Maguire, and Braun’s (2012, cited in Sullivan, Johnson, Owens, & Conway, 2014) comment that ‘behaviour is one of the dominant discourses of schooling’ (p. 98) highlights the challenge that teachers have to face in the classroom due to students’ disruptive or even aggressive behaviours. Other challenges include students’ lack of motivation and disengagement in learning, underachievement, and special education needs. These challenges are inter-related as students who misbehave in class are more likely to be low progress learners, while students who experience difficulty in learning tend to be disengaged. Even gifted and talented students may not actively engage in tasks when learning experiences are not appropriately customized for them. These challenges lead to with classroom management issues, teacher stress and burnout (Chang, 2013; see also Aloe, Amo,

& Shanahan, 2014), and can affect instructional effectiveness and students' learning outcomes (Angus et al., 2009, cited in Sullivan et al., 2014). Worse still, these challenges can lead to teacher attrition (Martin, Sass, & Schmitt, 2012), causing a huge wastage of resources in teacher education (Yeung *et al.*, 2015).

While it is good to examine how the above-mentioned challenges may have affected the teachers and students so that measures can be taken to enhance their wellbeing, it is advisable to take a positive approach by identifying what factors can encourage teachers to take up these challenges. In addition, although there are studies on teachers' perceptions of students with disruptive behaviours in mainstream schools (e.g., Nash, Schlösser, & Scarr, 2016; Sullivan et al., 2014), much extant research has focused largely on students with social, emotional, or behavioural difficulties, disorders, or disturbance (see Armstrong, 2014; Armstrong & Hallett, 2012; MacFarlane & Woolfson, 2013). These students account for only a small population of the class although their inclusion into mainstream schools have posed a great challenge to teachers. What teachers face every day in mainstream schools are students with low-level but frequent disruptive or disengaged behaviours (Sullivan et al., 2014), and/or students who may need more attention and efforts on the part of the teacher, including those with special education needs and/or low-progressing in academic work. Little research has explored how teachers' self-perceptions (e.g., self-concepts) are related to their willingness to teach challenging students in mainstream classrooms. One exception is Baker (2005), who investigated teachers' readiness (i.e., competence and willingness) to teach challenging students but, like many other studies, the focus is on students with emotional or behavioural disorders.

The current study represents an initial step to address these gaps with a focus on teachers' willingness to work with students in mainstream schools who may pose a challenge to the teachers. An important first step towards filling these gaps is to identify the factors that may encourage teachers to take up the challenge of teaching "challenging" students. Specifically, this study investigates how two dimensions of teachers' self-concept (i.e., affective self-concept, and cognitive self-concept) are linked with their willingness to teach challenging students. The study of willingness is of practical significance because willingness drives action. For example, Craven, Yeung, and Han (2014) have demonstrated that medical students who are willing to provide medical service to indigenous Australians are more likely to accept work in rural locations with indigenous populations despite obvious difficulties. Understanding gained from this research will contribute to better preparation of pre-service teachers, and enhanced mentoring for beginning teachers. This missing information is also essential for teacher recruitment and to minimise wastage of resources (e.g., teachers leaving teaching due to challenges encountered in the classroom) invested in teacher education.

Literature Review

Defining Challenging Students

In the literature, students who pose a challenge to the teachers, either behaviourally or academically, are often referred to as at-risk students (e.g., Cumming, Strnadová, & Dowse, 2014; Walker & Graham, 2019), as they are at risk of poor school adjustment and academic performance, or even dropping out of school and social exclusion. Other terms include students with special education needs (e.g., Arrah & Swain, 2014), or students presenting social, emotional and behavioural difficulties (e.g., Armstrong, 2014; Cooper, 2011; MacFarlane & Woolfson, 2013). In the current study,

we adopt the term “challenging students” to refer to students who may be a challenge to the teacher, either behaviourally or academically. They may exhibit challenging behaviours in class that may be disruptive or even aggressive, and/or are academically low-progressing. They can be any student in the mainstream classroom, including those who are gifted and talented or with special learning needs. Moreover, most teachers work in mainstream schools with students of varying learning needs and academic progress levels. They may not have sufficient knowledge to differentiate various kinds of challenging students, or even have a choice of teaching a specific type of challenging students. In essence, the profile of challenging students in a school or a class is very likely to be heterogeneous and may range from minor behavioural issues to major pathological problems that constitute a variety of challenges to teachers. In addition, the term “challenging” conveys a more positive perspective than “at-risk”, as challenges can also be opportunities for a change in the students, despite special management and motivational handling on the part of the teacher that go beyond the general needs of the class. This is also aligned with the focus of the study in identifying the factors that can predict teachers’ willingness to take up the challenge of teaching these students. In other words, this study looks at challenging students from the perspective of the teachers (i.e., their willingness to teach challenging students), rather than focusing on the students.

Teachers’ Willingness to Teach Challenging Students

To teach challenging students effectively, teachers need to be willing to work with them. Korb (2012) identified four qualities of teachers who can work with challenging students effectively and three of them are closely related to teachers’ willingness. First, teachers need to have the *desire* to work with these young people and to have a positive impact on them. Second, teachers need to be *dedicated* to do whatever it takes to make an impact on their students. Third, teachers need the *determination* to continue trying to reach students, regardless of various issues that may make their work difficult. The process of becoming effective in working with challenging students may take a long time. However, the potential payoffs of making such a commitment can be substantial. Not only will those students who are deemed to be challenging benefit from teachers, other students will also benefit from less disruption. Teachers’ wellbeing will also be enhanced through their appreciation of the positive contribution they are making in students’ lives.

Despite the importance of teachers’ willingness to work with challenging students, research on pre-service teachers and beginning teachers consistently shows that challenging students are one of their top concerns (e.g., Dicke, Elling, Schmeck, & Leutner, 2015). They often feel less confident and unprepared to work with challenging students. These teachers are more likely to feel stressed, depressed, and burned out (Chang, 2009). Even in classes where students are gifted and talented, some may be disaffected due to boredom and teachers may be caught by surprise when having to handle behavioural problems of gifted and talented students (Yeung, Chow, & Chow, 2005). In other words, student variations in terms of academic performance and behaviour do exist, so there are inevitably students who require extra effort from the teacher. To put it differently, teachers have to be ready for challenging students. These students, given either their undesirable progress in academic work, or unaccepted behaviours, or both, are in urgent needs of teacher support. In essence, teaching challenging students can be a complex and taxing job, especially for pre-service teachers and beginning teachers. Therefore, it is necessary to identify factors that may

encourage pre-service teachers and beginning teachers to take up this challenge. This study explores the predicting power of two teacher self-perceptions (i.e., affective and cognitive self-concepts) in relation to their willingness to work with challenging students.

Self-perceptions

Self-concept and self-efficacy beliefs are two constructs about one's perceptions of self. The distinction between these two concepts remains complex and disputable. In general, researchers have agreed that these two constructs are not totally distinctive, but overlap. In essence, both constructs represent self-perceived competence in relation to prior mastery experience and social comparison and reinforcement; they are both domain-specific and multidimensional, and both can predict behavioural, affective and cognitive outcomes (Bong & Skaalvik, 2003). One of the distinctions is that "self-concept represents one's general perception of the self in given domains of functioning, [while] self-efficacy represents individuals' expectations and convictions of what they can accomplish in given situations" (Bong & Skaalvik, 2003, p. 5). Likewise, while cautioning researchers not to over-emphasise the distinction between these two constructs, Marsh et al. (2019) identified three key characteristics that distinguish self-concept from self-efficacy: retrospective versus prospective, evaluative versus descriptive, and frame-of-reference effects. Specifically, although both constructs can predict future behaviour and outcomes, self-concept represents perceptions largely based on previous experiences and accomplishments, influenced by others' evaluations and reinforcements, and by internal and external frames of reference or standards. On the other hand, self-efficacy addresses what one can do/achieve with respect to a specific task/activity in a particular context. In other words, self-concept is a self-evaluation of one's current level of competencies (e.g., how competent teachers believe they are as a teacher) or feelings (e.g., how satisfied teachers feel as a teacher). While self-efficacy asks about one's level of confidence in successfully doing something in a specific task/situation (e.g., how confident teachers believe they can use different modes of assessment to assess students' learning).

Teacher Self-concept

Given that the focus of the study is on teachers' overall perceptions as a teacher in relation to their willingness to work with challenging students, it is more appropriate to examine their self-concept rather than self-efficacy, which assesses different aspects or levels of a targeted performance (Bong & Skaalvik, 2003). Prior research on self-concept primarily focuses on students' perceptions in a given academic domain (e.g., whether they believe they are good at mathematics). Research on teacher self-concept is lacking. The present study addresses this gap by looking at self-concept in the teaching domain, that is, teachers' views of themselves as teachers. There exist different views concerning whether self-concept includes both affective and cognitive dimensions and whether these are distinguishable. Like Arens, Yeung, Craven, and Hasselhorn (2011) and Bong and Skaalvik (2003), we believe that the cognitive and affective dimensions should be examined separately and this study will demonstrate whether the two dimensions are empirically separable in the teaching domain. In addition, it will also verify their predictive utility in relation to teachers' willingness to teach challenging students. Earlier research on students' academic self-concept demonstrated that the affective dimension is a better predictor of choice indicators (e.g., course selection), while the cognitive dimension is a better predictor of performance indicators (e.g., academic

achievement) (Bong & Skaalvik, 2003; Arens et al., 2011). This study will test whether this pattern is true for the field of teacher self-concept.

Affective Self-concept

In self-concept research, passion, interest, enjoyment in a certain domain may be conceptualised as the affective aspect of self-concept as opposed to a sense of competence, which may be conceptualised as the cognitive aspect of self-concept (Arens et al., 2011). Teachers' affective self-concept is one of our focuses because, "teaching and learning are not only concerned with knowledge, cognition, and skill. They are also emotional practices" (Hargreaves, 2001, p. 1056). Research on teacher affective self-concept and its relationship with teachers' perceptions of challenging students is scarce. However, attribution theory (Weiner, 2010) found teachers' perceptions of students to be correlated with their emotions, which affect their teaching behaviours. For example, teachers who attribute students' low academic performance to a lack of ability tend to show more empathy with these students, and are more willing to provide support for these students (see Wang & Hall, 2018). In addition, teacher self-concept is strongly correlated with emotional exhaustion (Zhu et al., 2018), partly due to challenges in relation to students (Aloe et al., 2014; Chang, 2013). Therefore, it is likely that teachers dealing with challenging students are less likely to have a positive perception of themselves as a teacher. Conversely, those who perceive to enjoy being a teacher may be more positive about students who are disruptive or difficult to work with, and are therefore more accepting and willing to take on such challenges.

Cognitive Self-concept

A sense of competence may be conceptualised as an aspect of self-concept, but in a cognitive sense (Arens et al., 2011). The importance of this cognitive aspect of the self lies with its strong prediction of performance outcomes (Marsh & Yeung, 1997). For teacher education, the development of competence in teaching has long been a strong focus. The underlying assumption is that individuals who are strong in their teaching competencies are more effective teachers and can potentially contribute to student learning gains. For challenging students, given their under-achievement or misbehaviour, the importance of the willingness of competent teachers to teach them is self-evident. On top of actual competence in teaching, a teacher's self-perception of teaching competence is also essential. Research on self-competence beliefs has consistently shown that one's self-competence beliefs make things happen and lead to positive outcomes, often beyond the effects of actual competence (Craven & Yeung, 2015). In the field of pre-service teacher education, Kaldi (2009) found a positive association between pre-service teachers' perceived teaching competence and their teaching preferences and intentions. Yeung, Craven, and Kaur (2014) further demonstrated that teachers' competence and value beliefs affect their perceptions of student abilities, which may influence their way of teaching. We therefore hypothesise that a positive sense of teaching competence is one of the key predictors of teachers' willingness to face challenging cases. However, based on earlier research on the different explanatory roles of affective and cognitive self-concept, we hypothesise that teachers' affective self-concept is a stronger predictor of their willingness to teach challenging students than is cognitive self-concept.

The Present Investigation

The study investigates how teachers' affective and cognitive self-concepts relate to their willingness to teach challenging students. We attempt to answer the following two research questions:

1. Which of the two self-perceptions – affective self-concept and cognitive self-concept – better predicts teachers' willingness to teach challenging students?
2. How will the patterns of association change across three time points of data collection?

Methodology

Participants

Data for the present study are from a larger longitudinal research project conducted at the National Institute of Education (NIE), Nanyang Technological University (NTU), Singapore. The project examined the development of teachers' professional competence and identity from pre-service teacher education to in-service teaching. NIE is the sole institute in Singapore that offers pre-service teacher education. The participants in this study were enrolled the one-year Postgraduate Diploma in Education (PGDE) programme (July 2012 intake). We surveyed this cohort at three time points, first at the entry into the PGDE programme (Time 1), second at the point of exit from the PGDE programme (Time 2), and third at the end of first year in-service teaching (Time 3). The numbers of participants who gave complete answers to the surveys at Time 1 to time 3 were 450, 356, and 203 respectively. 108 participants returned with complete responses across all the three surveys. A decision was made to use the dataset from these 108 participants to better make statistical comparisons over time.

Measures

The constructs examined in this study are: 1) affective self-concept (ASC), 2) cognitive self-concept (CSC), and 3) willingness to teach challenging students (WTCS). There were four items for each construct. The participants rated each on a six-point scale (1 = strongly disagree, 6 = strongly agree). The items for ASC and CSC were adapted from related research on students' academic self-concept (Arens et al., 2011; Marsh, 1992). Items for WTCS were designed by the research team for the longitudinal research project. The constructs and items, together with the factor reliabilities, are provided in Appendix A. University ethics clearance was obtained from Institutional Review Board before data collection.

Statistical Analysis

The responses were coded with higher scores reflecting more favourable responses. Cronbach's alpha reliability was examined before applying a confirmatory factor analysis (CFA) model to test the ability of the 12 items to form the three factors (Model 1). The analysis was conducted with the SPSS AMOS software (version 23). To assess model fit, we followed widely accepted criteria (see Browne & Cudeck, 1993; Byrne, 2010). The CFA model was tested separately for Time 1, Time 2, and Time 3.

When the CFA models were established, analysis of variance (ANOVA), correlation analysis, path analysis and commonality analysis were used to answer the research questions.

ANOVA employed the raw survey data to demonstrate mean differences of the same factor across the three time points. Details of the choice of analytical approaches and procedures are given in Appendix B.

Results

CFA

The alpha reliabilities of the three scales were acceptable (all > .80), providing preliminary support for the scales. In the preliminary analysis, item 4 in affective self-concept (*I feel good because I am a teacher.*), item 2 for cognitive self-concept (*I know what it takes to be a good teacher.*) and item 2 for willingness to teach challenging students (*I wouldn't mind teaching academically weak children*) showed much lower factor loadings and much higher error variances than other items in the respective constructs in the CFAs. These items were therefore deleted from subsequent analysis. Fit indices for CFA presented in Table 1 suggest that the 3-factor CFA models at Time 1, Time 2, and Time 3 all provided a reasonable fit to the respective dataset. In addition, all the factor loadings were acceptable (all > .50). The final alpha reliabilities of the scales are reported in Appendix A.

Fit Index	3-factor CFA (Time 1)	3-factor CFA (Time 2)	3-factor CFA (Time 3)
<i>N</i>	108	108	108
χ^2	36.84	51.63	55.62
<i>df</i>	24	24	24
<i>p</i>	.05	.001	<.001
TLI	.97	.94	.92
CFI	.98	.96	.95
SRMR	.05	.04	.04

Table 1- Fit indices for confirmatory factor analyses

Mean Differences

The means and standard deviations for the three waves of data are presented in Table 2. The results showed that there was a drop in ASC from Time 1 ($M=4.91$), to Time 2 ($M=4.74$), and Time 3 ($M=4.44$). ANOVA and post-hoc analysis (Least Significant Difference (LSD) test) indicated significant mean difference between Time 1 and Time 3 ($p < .001$), and Time 2 and Time 3 ($p < .05$). Results on teachers' cognitive self-concept showed an increase from Time 1 ($M=4.27$) to Time 2 ($M=4.53$), but a decrease from Time 2 to Time 3 ($M=4.36$). ANOVA and post-hoc analysis found a significant mean difference for CSC between Time 1 and Time 2 ($p < .05$). The trend for WTCS was similar to that of ASC. There was a decrease from Time 1 ($M=4.45$) to Time 2 ($M=4.35$), and Time 2 to Time 3 ($M=4.10$). ANOVA and post-hoc analysis suggested a significant mean difference between Time 1 and Time 3 ($p < .01$). The difference between the means of WTCS at Time 2 and Time 3 was marginally significant ($p = .06$).

Constructs	Time 1		Time 2		Time 3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
ASC	4.91	0.84	4.74	0.86	4.44	1.00
CSC	4.27	0.82	4.53	0.81	4.36	0.72
WTCS	4.45	0.97	4.35	1.02	4.10	1.00

Table 2- Mean differences for ASC, CSC, and WTCS from Time 1 to Time 3

Correlations

Table 3 presents the correlations among the three factors at Time 1, Time 2, and Time 3 respectively. First, the three factors were distinguishable from each other (all < .90). Second, the correlations among the three factors were all positive and statistically significant at the 0.01 level. Third, the correlations of ASC and WTCS were generally stronger than that of CSC and WTCS (.54 vs .30 at Time 1; .65 vs .62 at Time 2; and .75 vs .67 at Time 3). These correlation results provided preliminary support for our hypothesis that ASC was a stronger predictor than CSC of teachers' willingness to teach challenging students.

Time 1			
	ASC	CSC	WTCS
ASC	1		
CSC	.68**	1	
WTCS	.54**	.30**	1
Time 2			
	ASC	CSC	WTCS
ASC	1		
CSC	.83**	1	
WTCS	.65**	.62**	1
Time 3			
	ASC	CSC	WTCS
ASC	1		
CSC	.67**	1	
WTCS	.75**	.67**	1

** p < .01 (2-tailed)

Table 3 - Factor correlations at 3 time points

Path Analysis

In the path models, ASC and CSC were employed as the independent variables and WTCS as the dependent variable. Table 4 presents the regression coefficients of ASC and CSC predicting WTCS as well as the variance of WTCS explained by the two predictors in the path models at Time 1, Time 2, and Time 3. ASC and CSC explained 30%, 44% and 57% of the variance in WTCS at Time 1, Time 2, and Time 3 respectively. The increased R^2 in the path models from Time 1 to Time 3 indicates the increased predictive capability of the models. At each time point, the regression coefficient of ASC is larger than that of CSC. At Time 1, suppression effect in the path model is apparent, taking into consideration the negative regression coefficient of CSC, the positive and statistically significant correlation between CSC and WTCS (.30), as well as the large beta coefficient of ASC (.62, Table 4 below) that is larger than ASC's bivariate correlation with WTCS (.54, Table 3 above). At Time 2, the regression coefficients of both ASC (.43) and CSC (.26) are statistically significant. At Time 3, the regression coefficient of ASC (.71) is much higher than that of CSC (.07), which is not a statistically significant predictor in the model. In sum, the path analysis results suggested that ASC was a stronger predictor of WTCS than CSC.

Predictors	Time 1	Time 2	Time 3
ASC	.62***	.43***	.71***
CSC	-.13	.26*	.07
R^2	.30	.44	.57

* p < .05 (2-tailed)

*** p < .001 (2-tailed)

Table 4 - Regression coefficients of the independent variables and variance of dependent variables

However, the regression coefficients did not indicate how much of the variance in WTCS was explained by ASC and CSC respectively, limiting the knowledge we can obtain regarding the explanatory roles of the two predictors. In addition, as shown in Table 3 above, the correlations between ASC and CSC were .68 at Time 1, .83 at Time 2, and .67 at Time 3. The moderate to strong correlations across the three datasets suggested potential multicollinearity. To scrutinise this possibility, we conducted communality analysis. The purpose was to reveal the unique contributions of each independent variable (ASC, CSC) to the variance of the dependent variable (WTCS).

Commonality Analysis

Table 5 presents the commonality coefficients, which represent the proportions of variance explained in the dependent variable. At Time 1, the unique coefficient for ASC (.21) indicated that ASC uniquely explained 21% of the variance in WTCS, representing 70.49% of the R^2 effect. The unique coefficient for CSC (.01, 2.95% of the R^2 effect) was much smaller and indicated that the regression model only improved slightly with the addition of CSC. At Time 2, the unique coefficient for ASC (.06) indicated that ASC uniquely explained 6% of the variance in WTCS, representing 13.26% of the R^2 effect. The unique coefficient for CSC (.02, 4.67% of the R^2 effect) was still smaller than that of ASC. At Time 3, the unique coefficient for ASC (.28) indicated that ASC uniquely explained 28% of the variance in WTCS, representing 48.63% of the R^2 effect. The unique coefficient for CSC (.00, 0.43% of the R^2 effect) was much smaller and indicated that the regression model only improved slightly with the addition of CSC. In summary, the results from commonality analysis gives clear evidence that controlling the effects of CSC, ASC is a much stronger predictor of WTCS for all three time points.

Predictors	Time 1 ($R^2=.30$)		Time 2 ($R^2=.30$)		Time 3 ($R^2=.30$)	
	Unique	% Total	Unique	% Total	Unique	Common
ASC	.21	70.49	.06	13.26	.28	48.63
CSC	.01	2.95	.02	4.67	.00	0.43
ASC CSC	.08	26.55	.36	82.07	.29	50.94
Total		100		100		100

Table 5 - Commonality coefficients

Discussion

This study examined how teachers' affective and cognitive self-concepts may influence their willingness to teach challenging students, and whether there is a change across the three time points, namely, the time when they entered the pre-service teacher education programme, the point of exit from the programme, and at the end of their first year full time teaching. Results from correlation analysis, path analysis and commonality analysis showed that both the affective and cognitive aspects of teacher self-concept may positively influence participants' willingness to teach challenging students. However, controlling the effect of each other, affective self-concept is consistently shown to be a much stronger predictor of teachers' willingness to teach challenging students than cognitive self-concept.

Research question 1: Which of the two self-perceptions – affective self-concept and cognitive self-concept – better predicts teachers' willingness to teach challenging students?

The findings revealed that the stronger predictor for this cohort of participants' willingness to work with challenging students was their affective self-concept, irrespective of their stage of career development. That is, whether it was during their initial teacher preparation programme as pre-service teachers or when teaching in schools, the extent to which they enjoyed being a teacher was the most critical factor that would drive them to teach challenging students. Teaching involves building a relationship with others, especially students, with acceptance, care, effort, and support (Burns, 1989). Teachers who enjoy being a teacher are probably those who can establish a good relationship with their students (Boynton & Boynton, 2005). It could also be that teachers with a stronger sense of enjoyment are more resilient in making a difference in challenging students' behaviours and learning outcomes. For example, Gibson and Dembo (1984, as cited in Baker, 2005) proposed that teachers who perceive themselves as change makers are more likely to persist through difficult situations. Despite the difficulties they may find, they will continue to commit themselves to helping all students, no matter what special needs they may have and how challenging they may be. For such teachers who enjoy teaching, these students bring a positive edge for being a "challenge", as they give an opportunity for the teachers to experience the success of bringing about positive change to these students' learning and their lives. On the contrary, teachers who do not enjoy teaching may create poor classroom environments that can cause sustaining harm to students and their learning (Jennings & Greenberg, 2009).

Research question 2: How will the patterns of association change across three time points of data collection?

The correlation analysis showed that across all the three time points, both teachers' affective and cognitive self-concepts were significantly correlated with their willingness to teach challenging students, but affective self-concept had a stronger predicting power. However, it is interesting to note some of the results from path analysis across the three time points. At Time 1, cognitive self-concept was not a significant predictor. Therefore, with all other factors being equal, whether a teacher is willing to teach challenging students is mainly influenced by his or her level of enjoyment of being a teacher. A plausible explanation would be that when teachers enter pre-service teacher education, they have the lowest cognitive self-concept among the three points of data collection. The source of their cognitive self-concept is not based on adequate experience of teaching in schools. Therefore, the association of cognitive self-concept with willingness to teach challenging students would be weak. At Time 2, cognitive self-concept became a significant predictor of willingness to teach challenging students. This might be explained by the fact that after one year of study in the pre-service programme and practicum experience in schools, students' cognitive self-concept has increased significantly from its level at Time 1. With the theoretical knowledge and practical experience that may have boosted their perceived competence in teaching, teachers are willing to take up the challenge of teaching challenging students. However, at Time 3, it is likely that the 'reality shock' had a great influence on teachers' attitudes and career intentions. When many of them are struggling to meet the requirements of teaching in general, teaching challenging students is something that may bring extra stress and anxiety to them. Therefore, cognitive self-concept became a non-significant predictor in the path model. Another explanation is that, of the various

issues arising from students' diverse educational needs, discipline problems are probably the most prominent challenge for pre-service teachers and novice teachers (Ikoya & Akinseinde, 2010). Even for those who perceive themselves to be competent pedagogically, teachers may not see themselves as equally competent in managing challenging students in real-life teaching. Baker (2005) also found that teachers' willingness and ability to teach behaviourally challenging students were associated with their self-efficacy in classroom management. Therefore, the lack of confidence in classroom management competence may partly account for teachers' lower willingness to teach students who are more likely to have discipline issues. However, these explanations are purely suggestive and further research is needed to investigate deeper the reasons (e.g., mediating factors) between teachers' cognitive self-concept and willingness to teach challenging students.

To summarise, results from the three rounds of data showed that affective self-concept was the stronger predictor of participants' willingness to work with challenging students, either when they were pre-service teachers or when they became beginning teachers. In contrast, cognitive self-concept was a much weaker predictor of willingness to teach challenging students when affective self-concept was taken into account. When teaching in real school settings, it is mostly that teachers' affective self-concept matters. That is, across the journey from entry to pre-service teacher education to the time teachers teach full-time in schools, how much the teacher enjoys being a teacher is more important in accounting for teachers' willingness to teach challenging students, not how competent they think they are in teaching. However, it is important to point out that the correlations between cognitive teacher self-concept and willingness to teach challenging students were significant in all three datasets. Arguably, the sustainability of teachers' willingness to work with challenging students will not only rely on teachers' strong affective self-concept, but also on their capability to teach effectively (Yeung et al., 2015). Without adequate competence, their professional enjoyment could fade, leading to burnout and perhaps teacher attrition. The results from our study corroborate earlier theorisation and findings on the distinctive explanatory role of the affective and cognitive dimensions of self-concept (Bong & Skaalvik, 2003; Arens et al., 2011). The findings extend earlier research on students' academic self-concept (e.g., Bong & Skaalvik, 2003; Arens et al., 2011) that the affective dimension is a better predictor of choice indicators (e.g., course selection).

Implications

Teacher affective self-concept as a stronger predictor of their willingness to teach challenging students has important implications for both pre-service teacher education and in-service teacher deployment and support, as well as research on teachers working with challenging students. First, given that the data showed a downward trend for the level of teachers' affective self-concept and willingness to teach challenging students, it is perhaps advisable for pre-service teacher education to attach equal, if not greater importance to the affective dimension of teaching. This is essentially important in light of the increasingly challenging teaching environment. Only with a stronger sense of teaching enjoyment, coupled with a solid foundation of professional competence, can pre-service teachers be better prepared, both cognitively and affectively, to face the challenge of working with challenging students. Therefore, the affective dimensions such as enjoyment and pride as a teacher should be on the agenda of pre-service teacher education programmes. One possibility is to invite in-service teachers with successful experiences working with challenging students to share how their success with these students have brought them

enjoyment, fulfilment, and meaning as a teacher. During the school practicum stint, pre-service teachers can also be exposed to classes with challenging students by assisting or co-teaching with experienced teachers who can handle these students successfully. In so doing, they will have a taste of how to face and even solve these challenges in the future. This exposure should not be tied to the practicum assessment component.

For in-service teachers, it would be helpful to deploy teachers with a stronger sense of affective self-concept in teaching to work with challenging classes. However, there should be adequate in-service support for them to continue to contribute to the education of students with diverse educational needs. Research on teacher mentoring found approaches tailored to teachers' individual needs to be more effective in helping them dealing with challenges in teaching and this does affect teacher career intentions (DeAngelis, Wall, & Che, 2013). This case-by-case approach may be applied to support teachers working with challenging students to help maintain their motivation and passion in working with these students. For example, for teachers who experience challenges related to defiant students, there can be sharing and support on effective and successful scenarios, as well as unsuccessful cases, of working with these students. In addition, schools can work together to create a support system (e.g., a national online teacher support community, Kelly, Reushle, Chakrabarty, & Kinnane, 2014) for teachers to network with peers working with similar profiles of students. These approaches may help provide emotional support and create a positive perspective among teachers working with challenging classes and students, so that more teachers will be willing to take up this challenge.

Finally, the strongest message obtained from our findings is that affective self-concept is the stronger predictor of participants' willingness to teach challenging students. This suggests that rather than focusing on how challenging students may negatively influence teachers' personal and professional lives, research should move on to explore how to enhance and sustain teacher enjoyment in the profession. This positive approach may help retain qualified teachers to benefit students, especially those whose behaviour challenges teachers.

Limitations and Further Directions

This study has a few limitations pertaining to the datasets and data collection. Our sampled participants were pre-service teachers enrolled in a 1-year PGDE programme, who later became beginning teachers in Singapore mainstream schools. The findings may not apply to pre-service teachers in 4-year degree programmes, as more years in ITE may introduce more variability in attitudinal changes during the course of training. In addition, the findings may not be generalised to teachers in other countries with different teacher education systems and schools. Further research may be needed to validate the results with the use of different samples of teachers.

Another limitation is that data collection was conducted through an online survey about self-perceptions, which was self-reported in nature. Therefore, the findings should be interpreted with appropriate caution. Future research may benefit from surveying teachers from different ITE programmes to ascertain that these constructs are similarly valid for different cohorts, and correlate them with more objective measures of behaviour so as to more rigorously validate the measures used here. Research may also benefit from interviewing the participants to triangulate and complement the findings and to explore the reasons behind their acceptance of working with challenging students and the reasons for any change over time.

Notwithstanding these limitations, our study contributes to providing an initial understanding of how the self-concept of pre-service teachers and beginning teachers is

related to their willingness to teach challenging students in mainstream classrooms, which has not been extensively explored in previous studies. This understanding is of particular relevance to pre-service teacher preparation and in-service teacher deployment and support. Given the increasingly challenging school environments, that teacher affective self-concept consistently (across three time points) showed to be a strong predictor of their willingness to teach challenging students has important implications for teacher education. In other words, it is essential to attend to the affective dimension of teachers' professional life, which may encourage more teachers to take up the mantle of teaching challenging students.

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Appendix A: Items and Alpha Reliabilities of Variables

Variable	Sample Items	Alpha Time 1	Time 2	Time 3
Affective self-concept	I enjoy being a teacher.	.84	.86	.87
	I am proud of being a teacher.			
	I feel good because I am a teacher.			
	I like the way I am as a teacher.			
Cognitive self-concept	I have good knowledge to be a teacher.	.85	.89	.82
	I know what it takes to be a teacher.			
	I have the competence to function well as a teacher.			
	I understand my work well enough to be a teacher.			
Willingness to teach challenging students	I am willing to teach behaviourally challenging classes.	.84	.88	.86
	I wouldn't mind teaching academically weak children.			
	I am prepared to teach the naughtiest students.			
	I am ready to teach at-risk kids.			

Note: Each variable consists of 4 randomised items.

Appendix B: Statistical Analysis Details

Support for the three-factor model fit would require: acceptable reliability ($\alpha \geq .70$), an acceptable model fit (the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) $\geq .90$, and the standardised root mean square residual (SRMR), acceptable factor loadings $> .30$, and acceptable correlations $< .90$. The root mean square error of approximation (RMSEA) is not reported due to the small sample size and small degree of freedom (df) in the models of this study. According to Kenny, Kaniskan, and McCoach (2015), RMSEA should

not be computed for small df models and especially those with small sample sizes as it “too often falsely indicates a poor fitting model” (p. 486).

To take into account measurement errors, the other three analytical measures employed imputed factor scores from the 3-factor CFA models for each dataset through Bayesian imputation. Using imputed factor scores is necessary as some statistical measures (e.g., commonality analysis) can only process measured variables. Bayesian estimation was employed as it has been proven to be superior to other imputation measures such as regression and Stochastic regression imputation. For example, it has been shown to be computationally simpler, have lower standard errors, and allow for the use of the same imputed data sets for different types of analysis and “analysis models” that have different variables from the “imputation model” (Vriens & Sinharay, 2006). The disadvantage of Bayesian imputation is that it is more time-consuming to run (Vriens & Sinharay, 2006).

Correlation analysis was used to offer a general picture of the associations among the three variables. Path analysis was used to test the relative predictive power of ASC and CSC in relation to WTCS. Multicollinearity may be expected between the two predictors in this study as they measure the sub-facets of teacher self-concept. This assumption is supported by earlier research such as Arens et al. (2011). Commonality analysis is adopted to address multicollinearity (Kraha, Turner, Nimon, Zientek, & Henson, 2012). More importantly, it is used to reveal a clearer picture about the role of ASC and CSC in predicting WTCS. In addition to the information of relative predictive power from path analysis, commonality analysis identifies the unique contribution of each predictor as well as the shared variance for all combination of predictors. It is particularly useful when multicollinearity is present (Kraha et al., 2012).