

# **A longitudinal study on starting teachers' retention intention: Do pre-teaching work experience and length of working years make a difference?**

## **Authors' Manuscript**

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**Abstract:** This 4-wave longitudinal study examined how starting teachers' retention intention changed over three years. One-way repeated-measures analysis of variance (ANOVA) found a significant main effect of time on retention intention. Two-way ANOVA also showed a significant main effect of pre-teaching work experience, and years of work experience on retention intention. However, there was no significant interaction effect between time and pre-teaching work experience, and between time and years of prior work experience. These findings suggest that prior work experience in other professions and length of working years did not make a difference in starting teachers' retention intention over time.

**Keywords:** starting teachers; first-career teachers, second-career teachers; career changers; teacher retention intention; longitudinal study

### **Highlights**

1. Starting teachers entered teaching with a relatively high level of retention intention.
2. Starting teachers' retention intention dropped at the end of pre-service learning and first-year induction.
3. Second-career teachers do not necessarily have stronger retention intention than first-career teachers.
4. Late career changers do not necessarily have stronger retention intention than early career changers.

## **1. Introduction**

Attrition of starting teachers has posed a challenge to the retention of a healthy teaching force. One measure to solve this problem in many countries is to recruit mid-career professionals into teaching. One possible assumption is that these individuals, given their maturity in terms of age and/or prior work experience in other professions, may be less likely to leave teaching, as compared to graduates who join teaching fresh from university. If pre-teaching work experience can make a difference in teacher retention, this will be of importance to policies on, and practices of, teacher recruitment and retention. However, few studies have researched the retention

intention of these so-called second-career teachers, as teaching is not their first career. Despite an increasing number of studies on second-career teachers (see Tigchelaar et al., 2010), most addressed issues such as their motivations in making career change (Williams & Forgasz, 2009), development of teacher identities (Nielsen, 2016), conceptions of teaching and learning (Tigchelaar, Vermunt, & Brouwer, 2014), induction experiences (Brindley & Parker, 2010), or transfer of earlier experiences and skills to teaching (Mayotte, 2003). In addition, much previous research on second-career teachers involves case studies of one or a few participants, and longitudinal research is lacking in this field. Moreover, little information is known about the retention intention of second-career teachers as compared to first-career teachers (i.e., those without pre-teaching work experience). The majority of studies comparing these two groups of teachers have focused on their distinctive developmental process (see Tigchelaar et al., 2010). Furthermore, less is known about whether second-career teachers with different length of working years in other professions differ in their retention intentions.

This study attempts to address these gaps by adopting a longitudinal design to investigate the retention intention of starting teachers in Singapore. Using longitudinal survey data, this study intends to see first, how starting teachers' retention intention changes over three years, second, whether starting teachers with and without pre-teaching work experience differ in their retention intention over a span of three years, and third, whether length of working years in other professions makes a difference in these teachers' retention intention. In this study, "starting teachers" are those in their initial years of professional learning and development (i.e., the period from the start of pre-service teacher learning to the end of the second year induction). In the literature, these teachers are usually referred to as student teachers (during pre-service learning) and beginning teachers or novice teachers (during the first few years of teaching). However, the term "starting teachers" is more appropriate for student teachers and beginning teachers in Singapore, given its unique teacher education system, which will be described in more detail in Section 1.1 below. Following many others (e.g., Brindley & Parker, 2010; Tigchelaar et al., 2010), we adopt the term "second-career teachers" to refer to those who had worked full-time in other professions for at least one year before switching to teaching. For second-career teachers, teaching may not be literally the so-called "second" career for them, as some may have worked in more than one profession before. On the other hand, first-career teachers are those who choose teaching as their first full-time job.

Like other countries, Singapore has witnessed an increase in the recruitment of second-career teachers, who accounted for 25% of the teaching force in 2014 as compared to 15% in 2002 (Ng, 2014). These second-career teachers' length of working years in other professions varied greatly, and ranged from a year, 20 years, or even longer. However, unlike other countries, the resignation rate of starting teachers in Singapore is only around 5% (Ministry of Education Singapore, 2016). Given the large number of second-career teachers in Singapore and the relatively low attrition rate of starting teachers, studies on these teachers in Singapore may shed light on starting teacher retention and attrition in other contexts. The next section introduces Singapore's teacher recruitment processes and teacher education system to set the contextual background.

### ***1.1. Contextual background to the current study***

In Singapore, individuals interested in teaching need to apply to the Ministry of Education (MOE), which centrally organizes teacher recruitment and posting. A unique feature of teacher recruitment in Singapore is the introduction of a compulsory untrained teaching stint before teacher candidates' formal enrolment in pre-service programs. This means that applicants without teaching qualifications sign contracts with the MOE as "untrained contract teachers" and are deployed to teach in schools (MOE, 2018a) before pre-service learning. They will teach independently and/or co-teach with experienced teachers, ranging from a few months to one year or even longer. This policy applies to all candidates applying for Postgraduate Diploma in Education (PGDE) programs, except for MOE Teaching Scholars. These Teaching Scholars are exempted because the MOE assigns them for school attachments while they are pursuing their undergraduate or graduate studies in local or overseas universities sponsored by the MOE.

As for the majority of teacher candidates who are not MOE Teaching Scholars, they are either fresh graduates from universities (first-career teachers) or those who had worked in other professions (second-career teachers). At the end of their school experience, if deemed suitable for teaching by the school and willing to join the profession, they will sign a teaching bond with the MOE. Upon signing the bond, they are teachers employed by the MOE, although they are named as "student teachers" during the pre-service learning. They will then be enrolled in PGDE programs at the National Institute of Education, the sole pre-service teacher education provider in Singapore. PGDE programs were one year long at the point of data collection in this study

(August 2012) and have been extended to 16 months since Dec 2016 onwards. PGDE program participants need to study full-time before being posted to schools. This is different from their counterparts in alternative certification programs in other countries, who often have to work full-time while completing teacher certification requirements (Tigchelaar et al., 2010). In addition, their tuition fees are fully sponsored by the MOE; like practicing teachers, they also receive a monthly stipend and a year-end bonus.

Upon graduation they are bonded for three years to teach in government schools (MOE, 2018b). That is, employment is guaranteed for those who can successfully complete pre-service education. School postings are also centrally assigned by the MOE. During the first two years, they are referred to as “beginning teachers”. Formal induction support known as MOE Teacher Induction programmes including professional courses are provided for them at no charge (Academy of Singapore Teachers, 2018). They are offloaded in work and time for these courses and other professional development opportunities including nation conferences, symposia, and workshops, and school-level courses and training. Experienced teachers who are officially trained are also assigned to them as mentors to attend to their pedagogical and socio-emotional needs.

In summary, most second-career teachers and first-career teachers in Singapore undergo the same journey from going for the school experience, to pre-service program learning, and moving on to the first two years of induction. One major difference is that second-career teachers experience a career transition from being a mid-career professional to becoming a teacher, whereas first-career teachers experience a transition from fresh university graduates to teachers. Some second-career teachers may experience a pay cut due to the career change. Although teacher attrition in Singapore is one of the lowest globally, it is still desirable to explore the reasons for teacher attrition. Given that second-career teachers make up a quarter of the teaching force in Singapore, it is important to investigate how second-career teachers and first-career teachers are similar or different in their retention intention, and how their retention intention may change over three years. The next section provides the theoretical background for this study.

## **2. Theoretical background**

### ***2.1. Transition theory***

This study employs the principles of transition theory (Anderson, Goodman, & Schlossberg, 2011; Schlossberg, 1981; 2011) as its theoretical framework in investigating starting teachers' retention intention at different transition points. A transition refers to "any event or non-event that results in changed relationships, routines, assumptions, and roles" (Anderson et al, 2011, p. 39). Transitions can be anticipated (e.g., change of career), unanticipated (e.g., car accident), or a non-event (e.g., not getting married). According to Schlossberg (1981, 2011), what is more important is not transition per se, but how much it affects roles, relationships, routines, and assumptions, which "explains why even desired transitions are upsetting" (Schlossberg, 2011, p. 159). In addition, adaptation to transition takes time. Four interrelated systems affect an individual's attitude towards transition and his/her capacity to cope with a transition: *situation*, *self*, *support* and *strategies*, widely known as "the 4Ss". *Situation* consists of a trigger (what sets off the transition, which can be internal or external), timing (is it a good time to transit now?), control (is the transition self-initiated/within control or due to external factors/beyond control?), role change, duration (temporary or permanent), previous experience with a similar transition, concurrent stress (does the individual experience stress in other areas of life?), and assessment (does the individual view the transition positively or negatively?). *Self* includes personal and demographic characteristics (e.g., gender, age and stage of life), and psychological resources (e.g., self-efficacy, commitment and values, spirituality and resilience). Types of *support* include interpersonal support involving intimate relationships, the family unit, and network of friends, and institutional support in the form of lectures, workshops, group discussions or other professional development opportunities. Transition involves coping with a new situation, and an individual who can flexibly use various *strategies* to cope will have an easier transition.

For the current study, a transition of environments and roles occurs for both second-career and first-career teachers. For the former, it is a transition from a workplace (mid-career professionals) to postgraduate learning, and then to school teaching (starting teachers). For the latter, their transition is not as drastic as that of second-career teachers, when they transit from a university learning environment to pre-service teacher learning and school teaching. Given that second-career teachers differ from first-career teachers in terms of age, stage of life, and work experience, their retention intention during these transitions may vary from that of first-career

teachers. The next section will review international research literature about whether second-career teachers tend to stay longer in the profession as compared to first-career teachers.

## ***2.2. Shift in teacher retention/attrition intention***

Researchers on teacher retention/attrition agree that a multitude of factors account for teachers' decision to leave or stay in the profession (Lloyd & Sullivan, 2012; Torres, 2012). These include the struggles and challenges they face in teaching and in administrative tasks, workplace conditions, school support and mentoring, their teaching experiences, and their personal beliefs, perceptions, and characteristics. These multiple influencing factors make it difficult to attribute teacher retention/attrition intention to a single reason. Nevertheless, the vast number of studies on teacher attrition (see Borman & Dowling, 2008; Guarino, Santibanez, & Daley, 2006) suggest that there are changes in teachers' intention to stay in teaching along their career journeys. One indication of such change for starting teachers is withdrawal from the pre-service learning program (Chambers, Hobson, & Tracey, 2010), not entering teaching after graduation, or quitting teaching early (Struyven & Vanthournout, 2014).

In light of this, Lin, Childs, and Zhang (2016) suggest that at the stage of teacher recruitment, it is crucial to select candidates with a high level of commitment to teaching. This is because "the roots of teacher attrition can be found in initial teaching commitment and the quality of early teaching experiences" (Rots, Aelterman, Vlerick, & Vermeulen, 2007, p. 544). However, Torres (2012) found that those who entered teaching with the intention to stay long-term left earlier. In the local context, Bennett and Chong (2017) examined Singaporean pre-service music teachers' identities, motivations and career intention. Out of the 35 participants, 34 of them intended to teach during their teaching bond, while only 18 of them planned to teach beyond that time. As for starting teachers during the first few years, Kelly and Northrop (2015) found that the odds of teacher attrition was higher in the first year as compared to the second year. These findings are suggestive of a possible decline in starting teachers' retention intention from program Entry to program Exit, or even beyond into the induction years. The shift in retention intention, apart from the various factors mentioned above, could also be due to adaptation to transition into teaching.

## ***2.3. Transition into teaching and induction support***

Research on starting teachers' transition from pre-service learning to school teaching has documented that the first few years of teaching is challenging and support is important for them to wade through the induction period (Fantilli & McDougall, 2009). A change in roles partly explains the concerns and challenges that starting teachers experience during the transition (Flores, 2006). The transition is not easy, either for first-career or second-career teachers. For example, Brindley and Parker (2010) found that second-career teachers experienced similar struggles and contextual pressures as their baccalaureate counterparts while adapting to the role of a teacher. Hoggard, Slostad, and Winterton (2006) concurred that like first-career teachers, second-career teachers encountered similar challenges such as time management, classroom discipline, administrative work, work-life balance, etc. Locally, Tan's (2012) case study of five second-career teachers in Singapore also suggested that transition into the new career was challenging for these teachers during their first year of teaching. Mayotte (2003) documented that first-career teachers found it even easier to transit into teaching than did second-career teachers.

Induction support seems to be of help in making transition into teaching easier. For example, many studies in Ingersoll and Strong's (2011) review found that support positively contributed to starting teachers' instructional practices, student achievement, and importantly, to their career commitment and retention. On the other hand, Long et al's (2012) review of literature on starting teacher induction support and attrition suggests that support such as mentoring can positively affect teaching effectiveness, but the direct link to teacher retention is not clear. The somewhat conflicting evidence in both reviews regarding starting teacher induction support and retention is probably due to the multiplicity of factors that influence one's decision on career choice and plan. How the induction programs are structured and implemented may also account for the effectiveness of these programs, and for these different findings about their positive impact on starting teacher retention. For example, DeAngelis, Wall, and Che (2013) found that comprehensive induction support positively impacted starting teachers' retention intention and decision. Other contributing factors include a collaborative school culture (Johnson & Birkeland, 2003), strong school leadership support (Brown & Wynn, 2009), and mentor-mentee matching (Smith, 2007).

#### ***2.4. Do age and pre-teaching work experience make a difference?***

Studies on occupational mobility showed that people with prior mobility experiences tended to be mobile again, but those who were older preferred to be less mobile (Carnicer, Sánchez, Pérez, & Jiménez, 2004). However, studies on teachers seem to have varying findings. For example, in a study of 1261 Dutch secondary school teachers, van Geffen and Poel's (2014) examined the relationships among mobility experiences, attitudes towards mobility, and intention to be mobile. They found that attitudes towards mobility were linked to past experience whereby mobility (change in the job in the last 5 years) and attitude towards mobility strongly predicted the intention to be mobile. It was also found that teachers who were more experienced and older were less likely to be mobile. On the other hand, research on teacher retention intention found little difference in terms of age, years in service, pre-teaching work experience and other personal characteristics. For example, Boyd et al. (2011a) found no difference in teacher retention and attrition among first-year teachers, those who had left, and the full sample of teachers. Boyd et al.'s (2011a) findings suggest that teachers may leave teaching regardless of age and years in service. Similarly, in Zhang and Zeller (2016), teacher retention did not differ in terms of age, gender, marital status, teaching levels, or teaching career plans expressed earlier. Unfortunately, the odds of attrition seem to be higher for those who are older (Kelly & Northrop, 2015; Lin et al., 2016).

As for research on second-career teachers, Boyd et al. (2011b) found little difference between career changers and other teachers' teaching effectiveness and retention. In Singapore, Tan (2012) found that during the first year some second-career teachers experienced a decline in self-efficacy, which affected their commitment to teaching, and even retention intention. Ingersoll (2001) suggests that career changers may shift to other professions after a few years of teaching, just as they had switched to teaching from other professions. This indicates that second-career teachers may not stay in teaching longer than other teachers. In Tan's (2012) words, "if they can decide to leave their previous career for teaching, it is not entirely implausible that they may choose to walk away from teaching if they perceive themselves to be not good at it" (p. 23). This statement is supported by Anthony and Ord's (2008) empirical study. Four of the 68 teachers left during the first 18 months, and the remaining 64 had mixed intentions as to whether to stay in teaching or not after the 2-year full-registration period.

## ***2.5. Summary***



Studies reviewed above have suggested possible decline in retention intention during the pre-service learning and early career phase. In other words, those who initially intend to stay long-term in teaching may still leave the profession. Second, transition into teaching is challenging for both second-career and first-career teachers, and support may help retain more teachers. Third, although Carnicer et al. (2004) and van Geffen and Poel (2014) indicated the influence of age in people's retention intention, others (e.g., Boyd et al., 2011a; Zhang & Zeller, 2016) found teachers did not differ in their retention intention in terms of age or other background factors. Given that second-career teachers make up a substantial and growing part of the teaching force in many countries including Singapore, their retention intention is worth investigating. However, research on this particular group of teachers, especially with reference to their counterparts – those without pre-teaching work experience in other professions, is rare. There is also a scarcity of studies on whether second-career teachers with varying length of working years in other professions differ in their retention intention. These gaps necessitate longitudinal studies on how starting teachers' retention intention changes over time, and whether there exists any differences in their retention intention in terms of pre-teaching work experience and working years.

### **3. The present investigation**

Drawing on longitudinal survey data, this study examines how starting teachers' retention intention changes across three years. Given the somewhat different findings from early research regarding age, pre-teaching work experience, and working years, we also look at how second-career teachers and first-career teachers, and late career changers and early career changers may differ in their retention intention. Specifically, we attempt to find answers to the following three research questions:

1. How does starting teachers' retention intention change over three years?
2. Do second-career teachers have stronger retention intention than first-career teachers over three years?
3. Do late career changers have stronger retention intention than early career changers over three years?

### **4. Methodology**

#### 4.1. Participants

The participants in this study were involved in a larger research study that investigated the impact of teacher education programs and early career experiences on the development of teacher competencies and identities. They were from a cohort of 1024 starting teachers enrolled in the PGDE programs (July 2012 intake) in the National Institute of Education. We tracked their retention intention from pre-service learning (Entry,  $n = 450$ ; & Exit,  $n = 356$ ) to the first two years (Year 1,  $n = 203$ ; & Year 2,  $n = 79$ ). There were in total 617 participants, as there were new participants and participant attrition at different time points. The mean age of second-career teachers was about 33.4 and on average they had worked for 8.1 years in other professions before switching to teaching. We therefore grouped those aged below 34 and with less than eight years of working experience as early career changers ( $N=117$ ), and those aged 34 or above and had worked for eight years or more as late career changers ( $N=74$ ). Table 1 below presents the sample characteristics.

Table 1

*Participant Characteristics*

Sample	Sample size		Gender			Age		
	<i>N</i>	%	Male	Female	Missing	<i>M</i>	<i>SD</i>	Range
First-career teachers	426	69	107	253	66	23.62	1.55	21-29
Second-career teachers	191	31	68	89	34	33.38	7.08	23-51
Total	617	100	175	342	100	26.68	6.15	21-51

*Notes:* *N* = Sample Size. *M* = Mean, *SD* = Standard Deviation.

#### 4.2. Material and procedure

Survey data for the current study were from the larger study mentioned above. The survey had been piloted with the July 2011 intake of starting teachers at the National Institute of Education and revised accordingly. The construct about teacher retention intention consisted of three items (Table 2), which was developed by the research team based on a review of existing literature (e.g., Cross & Billingsley, 1994; Lebowitz, 1980). A 6-point scale was used for scoring (1 = strongly disagree, to 6 = strongly agree). After gaining approval from the Institutional Review Board of the University, we made an announcement in the Student Portal to alert the whole cohort of the PGDE programs about the upcoming online survey. In August 2012, the

survey was sent to all the 1024 starting teachers via the Qualtrics online platform. The same survey was sent to them at the Exit of the programs after they were back from the teaching practicum in schools, and at the end of their first and second years of teaching.

Table 2  
*Scale Items*

Teacher retention intention	Cronbach's alpha			
	Time 1	Time 2	Time 3	Time 4
	.86	.85	.87	.85
I hope to have a life-long career in education.				
I am willing to teach until I retire from the profession.				
I will not leave the teaching profession if I do not need to.				

*Note:* Scale measurement ranges from 1 (= strongly disagree) to 6 (= strongly agree).

### 4.3. Statistical Analysis

#### 4.3.1. Data preparation and imputation

One challenge for a 4-wave longitudinal research like the current study is participant attrition (e.g., participants drop out after the first wave of data collection and never return) and wave nonresponse (e.g., participants respond at waves 1 and 3, but miss waves 2 and 4), which result in missing data. To have a good understanding of the missing data, preliminary analyses were conducted before data were imputed. Preliminary analyses showed a non-monotone missing pattern, which suggested that the data were missing at random (McKnight, McKnight, Sidani, & Figueredo, 2007). Therefore, multiple imputation was considered appropriate for the current study (see Appendix A for more details about the preliminary analyses).

Conventionally it was suggested that five sets of imputed data (the default in SPSS) were sufficient (Rubin, 1987). However, Enders (2010) and Graham, Olchowski, and Gilreath (2007) recommended more, and stable estimates require 50 to 100 imputations (Harel, 2007), especially for large amount of missing data (e.g., above 50%). As the current data have about 82% ( $n = 371$ ) missing from Wave 1 ( $n = 450$ ) to Wave 4 ( $n = 79$ ), 100 sets were imputed. Missing data were multiple imputed using all the 12 observed items of retention intention (3 items per wave) across the four waves. Item-level is preferred because items tend to be highly correlated with

each other, and item-level imputation can reduce standard errors as compared to scale-level imputation (Enders, 2010).

#### 4.3.2. Data analyses

The multiple imputed data were then analysed using SPSS version 24.0. The 100 multiple imputed sets were analysed individually, and the average results were reported. One-way repeated-measures analysis of variance (ANOVA) tests were performed to ascertain how participants' retention intention changed over a 3-year period. In addition, mixed ANOVA tests were conducted to identify between-subjects effects, and interaction effects of time and pre-teaching work experience, and of time and years of pre-teaching work experience. Mauchly's tests were applied to assess the assumption of sphericity. Greenhouse-Geisser correction ( $\epsilon < 0.75$ ) or Huynh-Feldt correction ( $\epsilon > 0.75$ ) was used to correct for the degree of freedom where Mauchly's test of sphericity was significant ( $p < .05$ ) (Field, 2016).

## 5. Results

Figure 1 shows the changes in starting teachers' retention intention over the four waves of data collection across three years.

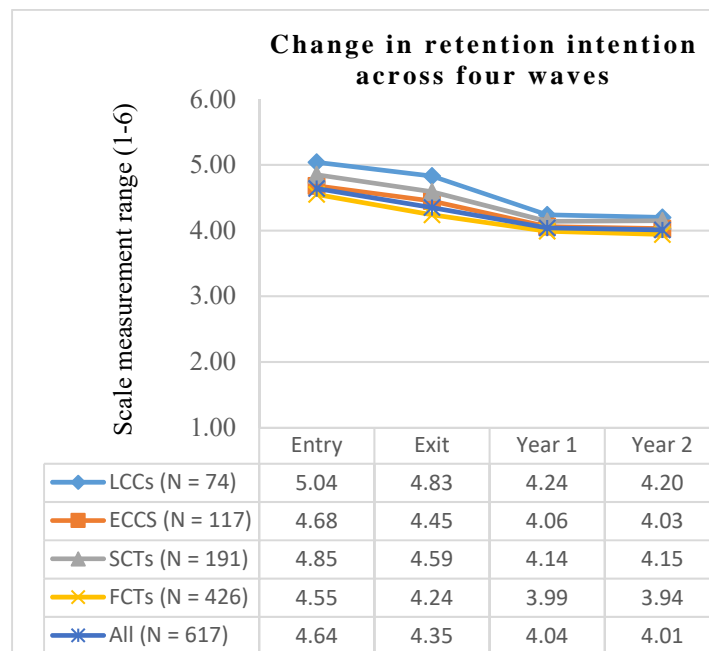


Figure 1: Changes in starting teacher retention intention over four waves

Notes: *N* = Sample Size. LCCS = Late career changers, ECCs = Early career changers, SCTs = Second-career teachers, FCTs = First-career teachers. Scale measurement ranges from 1 (= strongly disagree) to 6 (= strongly agree). Standard deviations are reported in Table 4.

*Research question 1: How does starting teachers' retention intention change over three years?*

One-way repeated-measures ANOVA tests were performed to examine the effect of time on participants' retention intention. Mauchly's test indicated that the assumption of sphericity was not met,  $\chi^2(5) = 68.83, p < .001$ . Therefore, degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ( $\epsilon = .93$ ). The results revealed a significant main effect of time on participants' retention intention over the three years,  $F(2.80, 1726.25) = 128.75, p < .001$ , with a medium effect size ( $\eta_p^2 = .17$ ) and a strong observed power of 1. As Table 3 below shows, follow-up repeated contrasts indicated a significant dip from program Entry to Exit, and from Exit to Year 1. However, retention intention in Year 2 did not differ significantly from Year 1, suggesting that these starting teachers' retention intention tended to stabilize after Year 1.

Table 3

*Repeated-measures ANOVA post hoc contrasts results*

<b>Contrasts</b>	<b><i>F</i></b>	<b><i>df</i></b>	<b><i>p</i></b>	<b><math>\eta_p^2</math></b>
Entry vs Exit	68.97	1, 616	< .001	.10
Exit vs Year 1	66.37	1, 616	< .001	.10
Year 1 vs Year 2	11.35	1, 616	> .05	.02

*Research question 2: Do second-career teachers have stronger retention intention than first-career teachers over three years?*

To examine whether there existed any difference between second-career teachers and first-career teachers over three years in retention intention, two-way (work experience x time) ANOVA tests were performed. The results showed a significant main effect of pre-teaching work experience, with second-career teachers rating higher than first-career teachers in retention intention,  $F(1, 615) = 14.84, p = .002$ , but with a small effect size ( $\eta_p^2 = .02$ ). As shown in Table 4, pairwise comparisons (Bonferroni) revealed that second-career teachers rated significantly higher than first-career teachers at both Entry and Exit, but not at Year 1 or Year 2. These findings suggested that second-career teachers entered and exited the pre-service programs with

higher retention intention than first-career teachers. However, second-career teachers' retention intention also dropped after going into teaching. In fact, if we take the level of retention intention at Entry as a baseline ( $M = 4.85$ ), we noticed that second-career teachers' retention intention declined more sharply at the end of first year induction ( $M = 4.14$ ) than that of first-career teachers ( $M = 4.55$  at Entry vs  $M = 3.99$  at Year 1). There was no significant interaction effect between prior work experience and time,  $F(2.81, 1726.36) = 4.67$ . This finding indicated that over three years, these starting teachers did not differ in their retention intention regardless of pre-teaching work experience.

Table 4  
ANOVA Pairwise Comparison (Bonferroni) Results

Time point	Second-career teachers ( $N = 191$ )		First-career teachers ( $N = 426$ )		$p$	Cohen's $d$	Late career changers ( $N = 74$ )		Early career changers ( $N = 117$ )		$p$	Cohen's $d$
	$M$	$SD$	$M$	$SD$			$M$	$SD$	$M$	$SD$		
Entry	4.85	0.84	4.55	0.93	0.003	0.33	5.04	0.86	4.68	0.80	0.006	0.44
Exit	4.59	0.88	4.24	0.89	0.000	0.40	4.83	0.79	4.45	0.92	0.007	0.44
Year 1	4.14	0.92	3.99	0.95	0.230	0.16	4.24	0.95	4.06	0.90	0.260	0.20
Year 2	4.15	0.92	3.94	0.88	0.180	0.24	4.20	1.03	4.03	0.90	0.340	0.18

*Research question 3: Do late career changers have stronger retention intention than early career changers over three years?*

The main effect for years of work experience yielded a statistically significant difference,  $F(1, 189) = 7.58, p = .02, \eta_p^2 = .04$ , with late career changers rating significantly higher than early career changers in retention intention. Pairwise comparisons (Bonferroni) showed that late career changers rated significantly higher than early career changers at both Entry and Exit, but not at Year 1 or Year 2 (see Table 4). These findings suggested that although late career changers had higher retention intention than early career changers during pre-service learning, both groups of career changers did not differ during the induction period. No significant interaction effect was found between time and years of prior work experience,  $F(2.85, 537.66) = 1.97$ . These findings indicated that years of pre-teaching work experience did not influence career changers' intention to stay in teaching over three years.

## **6. Discussion**

This study adopts a longitudinal design and investigates starting teachers' retention intention over three years. With the use of four waves of surveys, we are interested to see 1) how starting teachers' retention intention changes over three years, 2) whether teachers with and without pre-teaching work experience differ in their retention intention, and 3) whether varying length of years working in other professions makes a difference in second-career teachers' retention intention. The discussion below is organized around these three research questions. The first question looks at the overall trend of change in retention intention of all the participants over three years. We will discuss the results of the next two questions together, as the findings suggest similar interpretations.

### ***6.1. Overall trend of change in retention intention***

The first question investigates the retention intention of all the participants over three years, from the commencement of pre-service programs, to graduation from the programs and beyond into their first two years of teaching. First, it was found that all participants entered teaching with a relatively high level of retention intention (4.64 out of 6 at the Entry point). Whether this is attributable to the various measures in teacher recruitment in Singapore (e.g., school teaching experience before pre-service learning) needs further investigation, as Author et al. (2018) found that a lengthy school experience helped strengthen teacher retention intention. However, there was a significant dip in retention intention at the Exit point when participants returned from the 10-week teaching practicum in schools. This finding concurs with international and local literature that shows a declining trend in retention intention during pre-service learning (e.g., Bennett & Chong, 2017; Chambers et al., 2010). Unfortunately, this study does not show what factors caused the decline in starting teachers' retention intention. However, it raises the question of whether and how pre-service teacher learning programs can have a positive impact on teacher career commitment, which can be investigated in future research.

Second, during the induction years, starting teachers' retention intention further dropped at the end of the first year, but seemed to stabilize after two years of induction. This finding corroborates Kelly and Northrop's (2015) study of teachers during the first three years that retention intention was higher during the second year as compared to the first year. As mentioned

earlier, during these two years most participants of the current study had received comprehensive induction support and mentoring, believed to be a positive influencer on retention intention and decision (DeAngelis et al., 2013). As adaptation to transition takes time (Schlossberg, 2011), whether the positive impact of induction support started to take effect only after two years needs further investigation. As these participants were only followed until the end of their second year induction, how their retention intention will change when they become experienced teachers is not known. This calls for longitudinal studies on teacher retention intention beyond the early career stage. In addition, over the three years, there were transitions that entailed changes in roles and environments; how starting teachers' retention intention is related to these transitions and changes is also worth further investigation. The overall trend in starting teachers' retention intention from a higher level to a significant drop, and then to stabilization, attests to Rots et al.'s (2007) argument that teacher attrition has its roots in teachers' initial commitment to teaching.

### ***6.2. Do pre-teaching work experience and length of years make a difference?***

Results showed that second-career teachers rated significantly higher than first-career teachers in their retention intention during pre-service learning. However, during the two-year induction, the retention intention of second-career teachers was not significantly different from that of first-career teachers. The retention intention of late career changers and early career changers followed the same pattern. Second-career teachers' retention intention even dropped more sharply than that of first-career teachers from Entry to Year 1. The same trend was also found between late career changers and early career changers. These results confirm and extend current literature on starting teacher retention intention. They partially support earlier studies that found little difference between career changers and other teachers' retention intention (e.g., Boyd et al., 2011b). Second-career teachers in the current study, aged on average over 10 years older than first-career teachers, did not seem to have a "strong degree of commitment toward transitioning into teaching and determination to wade through the challenges and obstacles associated with the decision to do so" (Castro & Bauml, 2009, p. 121). In fact, as critiqued by Boyd et al. (2011b), the majority of earlier studies suggest that teachers with work experience are more likely to stay in the profession (e.g., Borman & Dowling, 2008). Through the analysis of longitudinal data, we showed that second-career teachers and late career changers did have stronger retention intention during pre-service learning, but not when they graduated from the



program and started full time teaching in schools. In other words, age, prior work experience, and length of working years did make a difference in retention intention when individuals decided to come into teaching, but not during the induction years. These findings highlight the importance of longitudinal research on teacher retention intention in terms of age, work experience, and other background characteristics. Had this study been confined to only the phase of pre-service program, we would have obtained results that are less complete.

## **7. Implications, future research, and limitations**

The change of starting teacher retention intention from a relatively high level at program Entry to a significant drop at the end of pre-service learning and the first year induction raises the question of how pre-service teacher education programs and schools can help teachers maintain the high motivation that brought them into teaching so as to retain them career-long. Our analysis also showed that even for second-career teachers and late career changers, their retention intention cannot be guaranteed. Although this does not mean that the practice of recruiting second-career teachers should be discouraged, it raises the question of whether age, prior work experience in other professions and length of working years make a difference in teacher retention intention. In other words, whether these background factors should be critical criteria in teacher recruitment needs consideration.

Given the limitations of the survey study, we are unable to claim any underlying factors that led to the drop in retention intention. Studies adopting a qualitative design such as interviews and journal writings can help substantiate, triangulate, and enrich these findings. In addition, this study only tracked teachers into their second year induction, further longitudinal studies would be useful to see how teacher retention intention changes over a longer period of time (e.g., during the first five years in schools). The patterns of change in retention intention may be quite different over five years, by which time the starting teachers would be experienced teachers. It would also be important to see how second-career teachers and first-career teachers, and late and early career teachers may differ in retention intention across different career stages. Therefore, investigations adopting a career-long perspective on teacher retention intention are needed. Another point to note is that teachers' reported intention do not equate their actual retention or attrition decision (DeAngelis et al., 2013). Future research can investigate whether there are any discrepancies between teachers' retention/attrition intentions and final decisions.

As with any research study, limitations will naturally exist. The first and perhaps most notable limitation is related to the large amount of missing data due to wave nonresponse or participant attrition in longitudinal studies. Despite the use of multiple imputation, which can potentially address some bias, the multiple imputed data may not fully capture the information regarding participants' retention intention as would a completely non-missing dataset. Another limitation is that the study was conducted in the Singapore context, where teacher recruitment and teacher policy system may be different from that in other jurisdictions. The findings may not be applicable to other cultures. Despite these limitations, this study has provided some evidence related to the retention intention of second-career teachers and first-career teachers, and to that of late career changers and early career changers. More importantly, our longitudinal analysis revealed some patterns of development that have not been discovered to date. Given the lack of previous research on this topic and the paucity of longitudinal evidence, this is a significant contribution to the field. However, numerous questions remain unanswered. Much more research is needed to examine the developmental trajectories of starting teachers, and how to enhance their career commitment levels.

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## Appendix A: Data preparation for multiple imputation

Missing data may lead to bias, loss of information, reduced statistical power, and improper conclusions (Collins, Schafer, & Kam, 2001). Multiple imputation, proposed by Rubin (1987), is one of the missing data imputation methods that can possibly mitigate these problems. Before applying multiple imputation to impute missing data, a good understanding of the missing data (e.g., amount and patterns of missingness, missing mechanism) is necessary. Data can be *missing completely at random* (MCAR, e.g., participants did not respond to the survey because of sickness, therefore the missingness is not related to the measured variables), *missing at random* (MAR, e.g., the missing value on “retention intention” is related to other measured variables in the survey), and *not missing at random* (NMAR, e.g., participants who are thinking of leaving or have left teaching did not respond to the survey). As the current study used a subset of data from the larger research mentioned above, preliminary analyses were conducted using the larger data set with all the scales included.

First, data were scanned for the amount and patterns of missingness using SPSS Descriptive Statistics. It was found that there was no missing value on items or variables, but there were wave nonresponses and attrition. It was also found that the missing pattern was not monotone for waves. For example, out of the 450 participants who had responded at wave 1, 225 (50%) dropped out at wave 2, but there were another 131 new participants. For the 356 participants at wave 2, only 139 retained for wave 3, and another 64 newly participated. Missing pattern that is not monotone suggests the possibility that the data were not missing due to MNAR (McKnight, McKnight, Sidani, & Figueredo, 2007). Next, *t*-tests were conducted to examine participant attrition. Specifically, for wave 1 data, comparisons were made between those who had retained for wave 2 ( $n = 225$ ) and those who had dropped out ( $n = 225$ ). No statistically significant differences were found between these two groups. No statistically significant differences were found between those who had retained and those who had dropped out at wave 3 and wave 4 either. These analyses suggested the possibility of MAR, and therefore multiple imputation was considered appropriate for the current study.