



Received: 10 October 2018
Accepted: 04 February 2019
First Published: 11 February 2019

*Corresponding author: Pit Ho Patrio Chiu, Office of Education Development and Gateway Education, City University of Hong Kong, Hong Kong.
E-mail: patrio.chiu@cityu.edu.hk

Reviewing editor:
Sammy King Fai Hui, Curriculum & Instruction, The Education University of Hong Kong, Hong Kong

Additional information is available at the end of the article

EDUCATIONAL ASSESSMENT & EVALUATION | RESEARCH ARTICLE

A study of graduate teaching assistants' self-efficacy in teaching: Fits and starts in the first triennium of teaching

Pit Ho Patrio Chiu^{1*} and Paul Corrigan¹

Abstract: Graduate teaching assistant (GTA) pre-service training programs proliferated in the past two decades as universities realized the importance of training GTAs to provide high quality teaching. It was assumed that GTAs were prepared to take on face-to-face teaching duties after completing their pre-service training. However, there has been little work on continuous monitoring of GTAs' demonstrated psychometric properties and behaviors once they have begun to teach. The purpose of this work was to study GTAs' self-efficacy in teaching in the first three years of their teaching careers and monitor any change in their perceptions of teaching at several critical junctures. A quasi-experimental study with pretest and posttest, followed by a cross-sectional study of three cohorts of postgraduate students was conducted. A total of 323 responses were received and a complete self-efficacy profile of GTAs in their first triennium of teaching was constructed. It was found that GTAs experienced a fluctuation of self-efficacy in teaching. They gained self-efficacy during the training period, but it declined once they were in-service teachers in their second year of postgraduate studies. Analysis showed that GTAs were able to regain self-efficacy in their third year of teaching. This study revealed for the first time a compelling, four-phase phenomenon of GTA development and identified GTAs' lowest self-efficacy period. It is also suggested that

ABOUT THE AUTHOR

Dr. Pit Ho Patrio Chiu is a Senior Education Development Officer at the City University of Hong Kong - Office of Education Development and Gateway Education. He has taught Physics and Engineering at City University of Hong Kong and other higher education institute in Hong Kong. He serves as the course leader of an institutionalized teaching & learning course, SG8001 - Teaching Students: First Steps, for all Graduate Teaching Assistants since 2011. He is also the key professional staff to establish a Gateway Education (GE) Laboratory, a technology-enriched Active Learning Classroom, for enhancing student interdisciplinary learning and supporting student innovations. His administrative duties include managing the Gateway Education Programme and Teaching Development Grants at CityU. His current research interests include technology-enhanced learning and active learning classroom.

PUBLIC INTEREST STATEMENT

A significant portion of undergraduate teaching is conducted by postgraduate research students nowadays in universities. These part-time teachers are known as Graduate Teaching Assistants (GTAs). Despite being given teaching duties, are these GTAs actually prepared to teach? This work reported a holistic view of GTAs' self-efficacy during their first three years of teaching and found that GTAs' perceived self-efficacy fluctuated significantly. It was found that their self-efficacy declined to the lowest point in the second year of their teaching duties and then went up steadily. Additional measures are therefore called for as low self-efficacy is likely to negatively affect GTAs' teaching performance. To help GTAs recover and regain teaching self-efficacy more effectively, a formal mentoring scheme is thus advocated to provide guidance and continuous support to GTAs after they are deployed to teach.

a formal mentoring scheme be added after the completion of the pre-service GTAs training course to provide continuous support to GTAs and to help them to regain self-efficacy in teaching.

Subjects: Educational Research; Higher Education; Teaching & Learning

Keywords: graduate teaching assistant; reality shock; self-efficacy

1. Introduction

Graduate teaching assistants (GTAs) are essential personnel in many research universities. They are postgraduate students, enrolled in master or doctorate programs, who are under tremendous pressure to pursue original research work and produce high quality publications, while simultaneously serving as tutors, laboratory instructors, or even lecturers, in return for which they receive financial support. Academic units often rely heavily on these 'part-time teaching staff' for supporting or teaching undergraduate courses. However, many of the GTAs do not possess, or have very limited, teaching experience prior to their postgraduate studies (Rushin et al., 1997; Schussler, Read, Marbach-Ad, Miller, & Ferzli, 2015). Even fewer of them have formal training in education. Combining the stress of research activity with limited experience in teaching, their willingness and confidence towards their teaching duties could be very low. The sole driving force for some to teach could be just the financial reward, while for others it could be intrinsic motivation for teaching or accumulation of teaching experience for future academic careers.

Since the 1990s, the management of many universities have begun to recognize the importance of well-trained GTAs for providing high-quality learning activities to undergraduate students. Subsequently, they have devoted resources to set up GTA training programs or courses (either compulsory or voluntary) to prepare GTAs to take on their teaching duties. Many of these training programs have been orientated towards generic teaching skills (Boyle & Boice, 1998; Park, 2004; Santandreu Calonge, Mark, Chiu, Thadani, & Pun, 2013) while others focused on discipline-specific teaching strategies (Deacon, Hajek, & Schulz, 2017; Gardner & Jones, 2011; Korinek, Howard, & Bridges, 1999; Lockwood, Miller, & Cromie, 2014; Noel, Crosser, Kuglin, & Lupomech, 2014). Both types of GTA training programs have been successful in helping GTAs develop the necessary pedagogical skill and instructional context for them to conduct effective face-to-face teaching. Researchers reported many positive effects of training programs on GTAs, such as creating a better learning and teaching environment (Langdon, Schlote, Melton, & Tessier, 2017); enhancing a sense of self-efficacy (Boman, 2013; Prieto & Meyers, 1999); increasing competency in teaching (Prieto & Scheel, 2008); and improving the learning experience of undergraduate students (Ryan, 2014). Some researchers even consider teaching ability as a necessary component of graduate education (Wulff & Austin, 2004).

Although formal GTA training programs may be well-designed and taught by experienced teaching professionals, they have often had limited contact hours. The typical duration of GTA training programs has ranged from a few days to a semester long (Schussler et al., 2015). This brief period of pre-service teacher education constrains the time for a fresh graduate student to fully develop into a well-rounded teacher. Continuous support to GTAs would help them to address this constraint as well as many of the other ongoing teaching challenges they face as they first embark upon teaching. A U.S. nationwide survey (Rushin et al., 1997) reported that these follow-up activities, such as mentoring, peer support, and in-class observation, to support GTAs, however, were loosely defined or non-existent. Even in the 21st century, structured GTA follow-up schemes or mentoring programs have not been widespread and have only been reported in some isolated cases (Hancock & Norton Jr, 2004). The Preparing Future Faculty program (www.preparing-faculty.org), a U.S. national initiative with 295 partner institutions in 2002, did include the critical element of formal GTA teaching mentorship but the program mainly focused on the full range of responsibilities including research, teaching, and professional services. In other words, GTA mentorship, especially for teaching, was only a fraction of

the program. In one study, GTAs reported that the commitment of their seniors to guide and support them in teaching was a significant intervention that increased their teaching effectiveness (Rukundo et al., 2017). However, evidence showed that much of that mentoring task was carried out by individual academics (Henderson, 2010) who needed to spend significant time and energy in mentorship.

To bridge the gap, empirical evidence would be necessary to validate the need for continuous, in-house teacher education support for GTAs beyond the formal pre-service training program. One way to harvest such evidence is to monitor GTA's self-efficacy in teaching during the first few years of their teaching career. Self-efficacy is defined as "a person's beliefs about his abilities to cope in different situations" (Sutherland, 1996). Bandura (1982) has established that the higher the level of perceived self-efficacy, the higher the performance accomplishments. He states that personal efficacy beliefs "contribute significantly to human motivation and attainments" (Bandura, 1995). For teachers, perceived teaching self-efficacy translates into the attainment of better teaching behaviour with higher confidence (Perren et al., 2017). Previous research reported that formal GTA training programs could boost self-efficacy in teaching and effective teaching behaviours (Boman, 2013; Korinek et al., 1999). Another study concluded that formal GTA training had a positive, statistically significant effect on GTA's sense of self-efficacy toward teaching (Prieto & Meyers, 1999). However, extended study on GTAs' self-efficacy beyond the initial pre-service teacher education program was rarely reported or was limited in its scope. Some researchers suggested that experience as a GTA was positively correlated with self-efficacy (Parker, 2014; Prieto & Meyers, 1999), but a few of them reported no correlation (Burton, Bamberry, & Harris-Boundy, 2005; DeChenne, Koziol, Needham, & Enochs, 2015). To clarify and understand the situation better, a comprehensive empirical study on GTAs' confidence in teaching in the first few years of their formal teaching duties would be needed.

The primary research objective of this work was to investigate GTAs' perceived self-efficacy towards teaching in their first triennium of service at a globally-ranked, research-intensive university. As they journeyed through the early stage of their teaching careers, GTAs' views and perceptions about teaching might fluctuate, depending on external intervention and/or the practical experience they accumulated. In this work, we attempted to understand and construct teaching self-efficacy profiles in the first three years of GTAs' teaching duties. The secondary research objective was to find out the aspects of their perceived improvement in teaching at the end of their third year of postgraduate studies. Results from this work provided an overview of GTAs' perceived teaching self-efficacy. It also provided empirical data for GTA training program instructors and university managers to evaluate the current situation. The primary research question guiding this study was: "Does GTA's perceived self-efficacy towards teaching change in the first three years of postgraduate study in a research intensive University?" and the secondary research question was: "What are the significant improvements?"

2. Methods

2.1. The research design

This study took place in a publically-funded research university in Hong Kong. All admitted full-time postgraduate students, mainly in the Ph.D. program, have to serve as GTAs as part of their graduation requirements. A compulsory pre-service GTA training course, *SG8001 Teaching Students: First Steps*, was provided to them during the first year of their studies (Mark, Thadani, Calonge, Pun, & Chiu, 2011a, 2011b). This intensive, fifteen-hour long GTA training course provided an introduction to the basic pedagogical knowledge and practical skills required for GTAs to take up teaching responsibilities. Student-centred active learning strategies within an outcomes-based approach were adopted in the course. Positive student feedback was reported (Santandreu Calonge, Chiu, Thadani, Mark, & Pun, 2011). All postgraduate students must successfully complete the GTA training course before they are given any formal teaching duties, such as in tutorials, laboratory demonstrations, or mini-lectures.

All GTAs are newly-admitted graduate students; while initially they may not have had a clear view of their teaching duties, their perceptions towards teaching might be subject to change during their postgraduate studies. In order to closely monitor the possible changes in their perceptions, this study adopted a two-stage research design approach which involved a quasi-experimental (pretest-posttest of self-efficacy in teaching) study in the first year of their postgraduate study and a cross-sectional study. The cross-sectional study involved surveying three cohorts of GTAs toward the end of their first, second and third year of studies. By using this two-stage approach, changes in the GTAs' perceptions could be observed in the first triennium of their teaching duties as they make the transition from pre-service preparation to in-service practice.

In order to implement this two-stage research design approach, a self-efficacy survey was introduced at several carefully selected critical points in the first three years of GTAs' studies. The first survey point was immediately after the students registered for study at the university but before they took the compulsory GTA training course. As most students did not have any practical teaching experience at the higher education level, results from the first survey served as baseline data for the whole study and was used to compare and determine changes or specific improvements in their perceptions of teaching as they progressed over the three years of teaching. The second survey point was after they had successfully completed the pre-service GTA training course during their first year study. By that time, GTAs had acquired basic knowledge of pedagogy as well as knowledge of the institutional teaching and learning environment; thus, they were considered to be adequately prepared to take on actual teaching duties despite most of them having yet to conduct face-to-face teaching or lead an in-class activity. The first and second survey formed the quasi-experimental part of this study; the pre-service GTA training course served as the intervention for the experiment. The third survey point was toward the end of their second year of study at the university. By this time they had accumulated at least one year of teaching experience. The fourth and final survey was administered towards the end of their third year of study, by which times GTAs had accumulated at least two years of teaching practice. The second, third and fourth surveys were conducted at the same time with the three cohorts of GTAs and it formed the cross-sectional study part of this work. Combining the quasi-experimental study data and the cross-sectional study data, the complete picture of GTA's perceptions in teaching, which captured all the crucial moments in the first triennium of teaching, can be constructed.

Following the Guidelines on Ethical Review of Research Involving Human Participants issued by the University, participants were informed at the beginning that the survey would be used for research purposes, including publication of articles and presentations, and their consent was requested to use the data they supplied without specifically identifying them. Consequently, the data was used only from those participants who gave their consent for it to be used. Furthermore, participation in the survey was voluntary whether consent to use the collected data was given or not. Right to privacy and confidentiality was strictly maintained during and after the study.

2.2. The instrument

The Teaching Assistants Self-Efficacy scale (TSE) (Boman, 2013) was used to assess the degree of confidence that teaching assistants felt when executing specific teaching behavior in a Canadian University and was adapted for this study. Boman's self-reporting TSE was modified from Tollerud's (1990) Self-Efficacy Towards Teaching Inventory (SET-I) and Streveler's (1993) confidence scale for TAs. One item of TSE—"Use videotape feedback to improve your teaching"—was removed from the original Boman TSE as that technology was not used in the current study. The final version of self-efficacy survey for the current study was a self-reported, 33-item questionnaire, using a five point Likert-scale for each question (from 1 = not confident to 5 = completely confident). In addition, an item on GTA's perceived teaching support provided by the University was also included in the survey. The anonymous survey was administered to participants through the online Qualtrics platform.

2.3. The participants

Three cohorts of GTAs from a research-intensive university in Hong Kong were invited to participate in this study. The three cohorts were postgraduate students in their first, second, and third year of studies. There were 333 students in the first year cohort, 372 students in the second year cohort, and 234 students in the third year cohort with a total of 939 invited participants. Most of them were enrolled in Ph.D. program and over 90% were classified as non-local students. The participants belonged to different academic disciplines with the majority coming from the College of Business, the College of Liberal Arts and Social Sciences, and the College of Science and Engineering. Less than 10% of the participants came from the Schools of the university (School of Creative Media, School of Energy and Environment, and School of Law), which are distinguished by their relatively smaller size compared to the Colleges of the university.

2.4. Data sources

The self-efficacy survey was sent to all 939 participants at different times according to four pre-set survey schedule points. The first year cohort was invited to complete the survey twice in this pretest-posttest survey, for a total of 1272 invitations. Out of this number, there were 323 valid responses (a response rate of 25%) for the entire study. The self-efficacy score for each response was computed by summing up the 33 items' values. While the maximum score for the survey was 165, the mean score for survey Time 1 was 119.85, Time 2 was 126.70, Time 3 was 121.66, and Time 4 was 130.98. Details of the survey response, self-efficacy score, and perceived teaching support for each survey time are summarized in Table 1. The survey data collected were found to have excellent internal consistency and Cronbach's Alpha for the 33 self-efficacy survey items was .977.

3. Results

We started our investigation by comparing survey Time 1, Year 1 Pretest, self-efficacy score (the baseline), versus Time 2, 3, and 4 data individually. Independent samples *t*-tests were conducted under these three scenarios. In the first scenario (Time 1 vs Time 2), students reported significant enhancement of self-efficacy in teaching. They had a better self-efficacy score in the Posttest (Time 2) as compared to the Pretest (Time 1) data. A very significant improvement of perceived self-efficacy was also recorded in the third scenario (Time 1 vs Time 4) where students thought they (Time 4) had much better self-efficacy in teaching as compared to the baseline (Time 1) data. As for the second scenario (Time 1 vs Time 3), Year 1 Pretest (Time 1) data and Year 2 (Time 3) data did not differ significantly. A comparison of the self-efficacy in teaching scores within the three scenarios is shown in Table 2. The results revealed a profile not seen before, indicating that GTAs gained self-efficacy in the first year, but lost almost all of that value in the second year. Then in the third year, their self-efficacy in teaching rebounded to the highest level in this study. This fluctuating upward trend of self-efficacy in teaching phenomena is the subject of a conclusive discussion in the later section.

Bolstered by the results, follow-up analysis was undertaken to determine the trend of the GTAs' perceived teaching support during the study period. It was found that their perceived teaching support and experience were significantly negatively correlated: $r(323) = -.16$; $p < .05$. In other words, the more teaching experience gained, the lower the level of teaching support perceived by the GTAs. Figure 1 shows the fluctuating upward trend of their self-efficacy in teaching in contrast to the decrease of their perceived teaching support from the academic units over the three-year period of study. These original empirical results provided evidence for answering the primary research question, that GTAs' self-efficacy value indeed had proceeded in fits and starts but overall showed a significant improvement in their first triennium of teaching.

The last analysis aimed to address the secondary research question, which was to determine the most significant improvements that GTAs perceived at the end of the study period. In order to answer this question, a *t*-test was applied to all 33-items of the self-efficacy survey individually, comparing the baseline data to the end of study, Year 3, responses. The result was encouraging, showing that 22 items were found to have significant improvement (Table 3). Out of these 22

Table 1. Self-efficacy survey and perceived teaching support responses

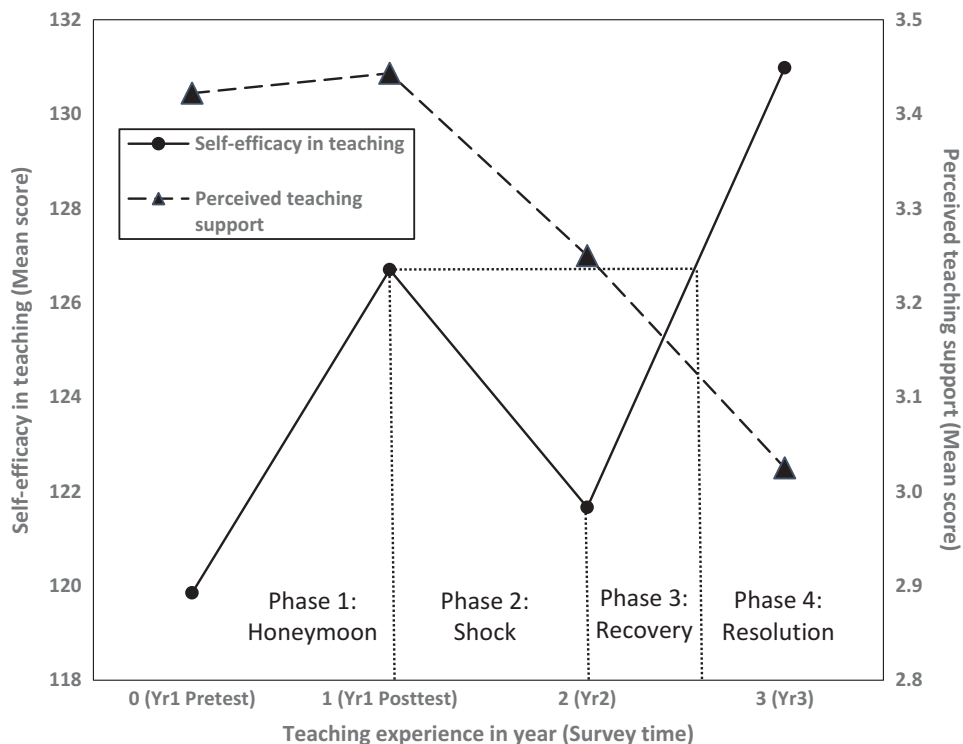
Survey time	Student status	No. of survey invitation	No. of responses	Mean self-efficacy score	SD of self-efficacy score	Mean perceived teaching support score	SD of perceived teaching support score
1	Year1 Pretest	333	154	119.85	20.37	3.42	0.74
2	Year1 Posttest	333	97	126.70	23.79	3.44	0.71
3	Year2	372	32	121.66	25.82	3.25	0.62
4	Year3	234	40	130.98	22.43	3.03	0.89
Total	All	1,272	323	123.46	22.53	3.36	0.75

Table 2. Comparison of self-efficacy in teaching scores under different scenarios

Scenario	Comparison of survey results	Difference between mean self-efficacy scores	t	Cohen's d
Year1 Pretest vs Year 1 Posttest	Time 1 vs Time 2	6.85	2.43*	0.31
Year1 Pretest vs Year 2	Time 1 vs Time 3	1.81	0.44	0.065
Year1 Pretest vs Year 3	Time 1 vs Time 4	11.13	3.01**	0.43

* $p < .05$. ** $p < .01$.

Figure 1. GTAs' self-efficacy in teaching and perceived teaching support versus teaching experience and the four phases of reality shock: 1) honeymoon phase begins when GTAs first enrol in the training course and ends when the course is completed at the end of year 1; 2) shock phase follows with the decline of self-efficacy value; 3) recovery phase starts when the self-efficacy value rebounds at the end of year 2; 4) resolution phase begins when the self-efficacy value rises beyond the previous peak value recorded in year 1.



items, three items were significantly different at the .001 level and five items were significantly different at the .01 level. These prodigiously positive results demonstrated the enhancement of GTAs' self-efficacy in teaching over their first three year of teaching.

4. Discussion

The global results from the analysis provide robust empirical evidence proving that GTAs indeed experienced a significant upward fluctuation in self-efficacy in the first triennium of their teaching careers. When we further investigated the data and traced it's trajectory from the beginning to the end of study, it emerged that GTAs had quite a bumpy ride in perceived self-efficacy. We can identify four difference phases in their transformation. The profile of these four phases closely resembles the four phases of 'reality shock' (Kramer, 1974): Honeymoon, shock, recovery and resolution; the designation of the four phases originates from research on

Table 3. Significant improvement of self-efficacy items

Item	Description	Yr1 Pretest (n = 154)		Year3 (n = 40)			t	p
		M	SD	M	SD			
1	State outcomes clearly for class	3.73	0.81	4.25	0.78	3.63***	0.000	
2	Motivate student interest in a lecture	3.36	0.93	3.83	0.98	2.81**	0.005	
3	Communicate at a level that matches students' ability to comprehend	3.58	0.85	3.93	0.83	2.28*	0.024	
4	Give a lecture	3.42	0.98	3.90	1.03	2.73**	0.007	
5	Give a lab demonstration	3.57	0.95	3.93	1.19	1.99*	0.048	
6	Respond to students' questions during lectures, labs, or tutorials	3.50	0.86	4.10	0.93	3.88***	0.000	
7	Respond to students' answers during lectures, labs, or tutorials	3.53	0.87	4.08	0.83	3.70***	0.000	
8	Plan an organized lecture	3.60	0.96	4.00	1.01	2.30*	0.023	
9	Provide constructive written feedback on exams and assignments	3.62	0.80	3.93	0.80	2.17*	0.031	
10	Use technology in the classroom	4.08	0.83	4.38	0.71	2.08*	0.039	
11	Assign grades to students' written assignments or examinations	3.84	0.86	4.30	0.72	3.07**	0.002	
12	Manage student disagreements with you	3.60	0.83	3.95	0.93	2.34*	0.021	
13	Model problem solving skills for students	3.46	0.74	3.83	0.81	2.71**	0.007	
14	Ask open, stimulating questions	3.50	0.82	3.85	0.83	2.40*	0.017	
15	Construct clear visual aids	3.66	0.87	4.08	0.97	2.62**	0.009	
16	Arrange for constructive peer feedback and suggestions to improve your teaching	3.50	0.80	3.80	0.82	2.10*	0.037	
17	Use gestures and body language effectively during presentations	3.63	0.89	4.05	1.06	2.56*	0.011	
18	Handle disruptive behaviour by students during class	3.23	0.89	3.65	1.15	2.52*	0.013	
19	Encourage class participation	3.51	0.90	3.85	1.08	2.06*	0.041	
20	Use student evaluations to improve your teaching	3.77	0.80	4.10	0.96	2.26*	0.025	
21	Think about your own teaching and make necessary changes to improve it	3.84	0.84	4.15	0.80	2.11*	0.036	
22	Overall, how confident are you in your ability to carry out your responsibilities as a teaching assistant?	3.69	0.84	4.03	0.95	2.15*	0.033	

*p < .05. **p < .01. ***p < .001.

the training of nurse students in becoming professionals. Reality shock theory has proven to be particularly useful in describing the psychometric transformation of a person from novice to professional. The theory has its roots in the original culture shock theory (Oberg, 1960) and is widely accepted and applied to different fields including training of new school teachers (Gaede, 1978; Hobson & Ashby, 2012; Veenman, 1984), and is also referred as 'transition shock' (Corcoran, 1981; Farrell, 2016).

Inferring from the analysis results and drawing on relevant literature, we judge that the GTAs under study in fact had encountered reality shock during their transitional period to in-service teachers. In our study, the four phases of reality shock clearly emerged in the GTAs' self-efficacy through their teaching profile (Figure 1). Our empirical data showed that GTAs gained self-efficacy during the training period in year 1, consistent with the pattern reported in prior works (Boman, 2013; Prieto & Meyers, 1999). At this time, GTAs indicated that the support in teaching provided to them was very good and they were excited and motivated to take on the new task in a new environment. At the end of this *honeymoon* phase, which occurred when the training course completed, GTAs thought that they were ready for in-service teaching, even though they had just acquired knowledge rather than actual skills for teaching in the field. In the next phase, when GTAs were assigned actual teaching duties and engaged in face-to-face activities with students, they began to realize the differences between their expected role and actual day-to-day operations. This unanticipated reality came as a *shock* and GTAs experienced uncertainty. If they managed to break through and persevere, they then entered the *recovery* phase. They began to think of teaching positively again and regained self-efficacy in teaching. They were able to see the reality of being a teacher and accept that situation. Tension or anxiety about their teaching duties lessened and they began to differentiate effective and ineffective teaching behavior. In the fourth and final phase, the *resolution* phase, GTAs regained all the teaching self-efficacy that they had lost in the shock phase and continued to improve their teaching. They more fully understood and accepted the role of being a professional teacher. Even though they still thought the university did not provide sufficient teaching support to them, they were still able to handle and resolve classroom issues. This oscillating upward trajectory of GTAs' self-efficacy can rather neatly be superimposed on the conceptual framework of reality shock as it details all the critical moments. It articulates the fits and starts during the transition process in the GTAs' earlier teaching career.

The 22 improvement items reported in the analysis were strong indications of GTAs reaching the resolution phase. The biggest improvement that they reported were their abilities to respond to students in all situations (Table 3: Item 6 and 7). These results demonstrated that GTAs had become skillful teachers and were able to handle the classroom professionally with proper pedagogical skill (Table 3: Item 1, 3, 4 and 11) as well as to motivate students in their learning (Table 3: Item 2, 14 and 19). Their overall confidence in their abilities to carry out the job also improved significantly (Table 3: Item 22). In other words, the results conclusively point to the successful transformation of postgraduate students from novice to professional teacher after the pre-service GTA training course and three years of teaching.

GTAs' perceived teaching support from the university remained at a steady level during the first year but it declined dramatically in the second year, and continued to drop throughout the third year (Figure 1). The high level of perceived teaching support reported in the first year coincided with the GTA training course and with GTAs increasing self-efficacy during the *honeymoon* phase. It is reasonable that GTAs were satisfied with the resource provided at this stage. But as they entered the next phase, they not only lost self-efficacy in regards to their own teaching but also could not find anyone to provide help, mentoring, or advice. Thus, they reported a low level of teaching support. This phenomena is strikingly similar to what new school teachers have reported as "a sudden cessation of induction-related support", referred to as reality *aftershock* (Hobson & Ashby, 2012).

The results point to a clear path: an effective way to help GTAs to recover from their lowest self-efficacy point is to provide continuous teaching support to them while they are in-service teachers. Continuous support to GTAs should be in addition to the existing pre-service intensive training course and the support should be available to GTAs throughout the academic year. This continuous support can be in form of a formal mentoring scheme, where GTAs meet regularly with mentors, either faculty members or experienced GTAs, during the semester to plan teaching activities, discuss pedagogy to be applied in the classroom, and/or solve any practical teaching issues. During the GTAs' weakest period, the shock phase, they need a role model to emulate and turn to. Mentors can act as role models to GTAs and give advice on GTAs' teaching practices. They can also provide guidance, share teaching experiences & subject expertise, disseminate good practices, and motivate the demotivated. Researchers have studied the benefit of mentoring to GTAs (Park, 2004) and advocated the need for formal mentoring scheme to enhance existing GTA training programs (Diggs, Mondisa, & Scott, 2017; Rukundo et al., 2017); Our study, with its self-efficacy orientation, reveals and illustrates for the first time a compelling, four-phase phenomenon of GTA development that clearly points to why such schemes are needed. Nevertheless, formal mentoring schemes are still not widely found in universities (Rushin et al., 1997; Schussler et al., 2015). Yet, such formal mentoring schemes can help GTAs to reduce their fears and feelings of helplessness during the shock phase. Mentors can also encourage GTAs to take greater responsibility for teaching tasks and to actively interact with undergraduate students, helping them to face the new reality of teaching in a positive way as well as to regain self-efficacy in teaching, facilitate their entry into the recovery phase, and direct them towards the longer term goal of fully becoming professional teachers.

5. Conclusion

GTAs are tasked with the important duty of providing high-quality teaching and they deserve to be well-trained and well-supported. In this study, we have observed that GTAs develop in fits and starts, encountering difficult periods in the first few years of their teaching careers. They experience reality shock and their self-efficacy in teaching fluctuates. While many universities have focused on providing varying measures of pre-service GTA teacher education, they often stop when that training is concluded (Schussler et al., 2015). Too often they have overlooked the need for continuing support such as a formal mentoring scheme. In fact, continuing support of teaching may be as important as a well-designed training course, as such support could help GTAs move out of the early shock phase, regain their teaching self-efficacy, and transform into professionals. This study has provided empirical data of what GTAs have experienced at one university, related it to a proven theoretical framework, and identified the critical period where a formal mentoring scheme is needed the most. Such evidence and analysis can help university managers to rethink, revise, and enhance their pre-service and in-service GTA education programs for a better teaching and learning environment.

Funding

The authors received no direct funding for this research.

Author details

Pit Ho Patrio Chiu¹

E-mail: patrio.chiu@cityu.edu.hk

ORCID ID: <http://orcid.org/0000-0003-4871-1488>

Paul Corrigan¹

E-mail: paul.corrigan@cityu.edu.hk

¹ Office of Education Development and Gateway Education, City University of Hong Kong, Hong Kong.

Citation information

Cite this article as: A study of graduate teaching assistants' self-efficacy in teaching: Fits and starts in the first triennium of teaching, Pit Ho Patrio Chiu & Paul Corrigan, *Cogent Education* (2019), 6: 1579964.

References

- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122-147. doi:10.1037/0003-066X.37.2.122
- Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 1-45). New York, NY: Cambridge University Press. doi:10.1017/CBO9780511527692.003
- Boman, J. S. (2013). Graduate student teaching development: Evaluating the effectiveness of training in relation to graduate student characteristics. *Canadian Journal of Higher Education*, 43(1), 100-114.
- Boyle, P., & Boice, B. (1998). Systematic mentoring for new faculty teachers and graduate teaching

- assistants. *Innovative Higher Education*, 22(3), 157–179. doi:10.1023/A:1025183225886
- Burton, J. P., Bamberry, N. J., & Harris-Boundy, J. (2005). Developing personal teaching efficacy in new teachers in university settings. *Academy of Management Learning and Education*, 4(2), 160–173. doi:10.2307/40214284
- Corcoran, E. (1981). Transition shock: The beginning teacher's paradox. *Journal of Teacher Education*, 32(3), 19–23. doi:10.1177/002248718103200304
- Deacon, C., Hajek, A., & Schulz, H. (2017). Graduate teaching assistants' perceptions of teaching competencies required for work in undergraduate science labs. *International Journal of Science Education*, 39(16), 2189–2208. doi:10.1080/09500693.2017.1367110
- DeChenne, S. E., Koziol, N., Needham, M., & Enochs, L. (2015). Modeling sources of teaching self-efficacy for science, technology, engineering, and mathematics graduate teaching assistants. *CBE Life Sciences Education*, 14(3), 1–14. doi:10.1187/cbe.14-09-0153
- Diggs, A. B., Mondisa, J., & Scott, R. D. (2017, June). Toward a systematic review of the preparing Future Faculty Program initiatives. Paper Presented at 2017 ASEE Annual Conference & Exposition. Retrieved from <https://peer.asee.org/29036>
- Farrell, T. S. C. (2016). Surviving the transition shock in the first year of teaching through reflective practice. *System*, 61, 12–19. doi:10.1016/j.system.2016.07.005
- Gaede, O. F. (1978). Reality shock: A problem among first-year teachers. *The Clearing House*, 51, 405–409. doi:10.1080/00098655.1978.9957085
- Gardner, G. E., & Jones, M. G. (2011). Pedagogical preparation of the science graduate teaching assistant: Challenges and implications. *Science Educator*, 20(2), 31–41.
- Hancock, T. M., & Norton, J. W., Jr. (2004, June). Experiences of graduate student mentors mentoring graduate student instructors. Paper Presented at 2004 ASEE Annual Conference & Exposition. Retrieved from <https://peer.asee.org/13001>
- Henderson, B. (2010). Mentorship of graduate teaching assistants: Effects on instruction and a space for preparing to teach adults. *Studying Teacher Education*, 6(3), 245–256. doi:10.1080/17425964.2010.518665
- Hobson, A. J., & Ashby, P. (2012). Reality aftershock and how to avert it: Second-year teachers' experiences of support for their professional development experiences of support for their professional development. *Cambridge Journal of Education*, 42(2), 177–196. doi:10.1080/0305764X.2012.676628
- Korinek, K., Howard, J., & Bridges, G. (1999). "Train the whole scholar": A developmentally based program for teaching assistant training in sociology. *Teaching Sociology*, 27(4), 343–359. doi:10.2307/1319041
- Kramer, M. (1974). *Reality shock: Why nurses leave nursing*. St. Louis, MO: C. V. Mosby Company.
- Langdon, J. L., Schlote, R., Melton, B., & Tessier, D. (2017). Effectiveness of a need supportive teaching training program on the developmental change process of graduate teaching assistants' created motivational climate. *Psychology of Sport and Exercise*, 28, 11–23. doi:10.1016/j.psychsport.2016.09.008
- Lockwood, S. A., Miller, A. J., & Cromie, M. M. (2014). Preparing future biology faculty. *The American Biology Teacher*, 76(1), 17–21. doi:10.1525/abt.2014.76.1.5
- Mark, K. P., Thadani, D. R., Calonge, D. S., Pun, C. F. K., & Chiu, P. H. P. (2011a). From neophyte to experienced facilitator: An interactive blended-learning course for graduate teaching assistants in Hong Kong. *Knowledge Management and E-Learning*, 3(2), 153–169.
- Mark, K. P., Thadani, D. R., Calonge, D. S., Pun, C. F. K., & Chiu, P. H. P. (2011b). In-service teaching assistant training (InsTAT) for engineering and computer science graduate students in Hong Kong: A blended-learning approach. *Proceedings of 2011 Frontiers in Education Conference, Rapid City, SD*. (pp. F2E-1–F2E-6). doi:10.1109/FIE.2011.6142930
- Noel, C. Z., Crosser, R. L., Kuglin, C. L., & Lupomech, L. A. (2014). How to build a course to teach accountants to teach. *Journal of Case Studies in Education*, 5, 1–16.
- Oberg, K. (1960). Cultural shock: Adjustment to new cultural environments. *Practical Anthropology*, 7, 177–182. doi:10.1177/009182966000700405
- Park, C. (2004). The graduate teaching assistant (GTA): Lessons from North American experience. *Teaching in Higher Education*, 9(3), 349–361. doi:10.1080/1356251042000216660
- Parker, P. (2014). *An examination of the impact of pedagogical preparation, teaching experience and future career plans on mathematics graduate teaching assistants' efficacy* (Doctoral dissertation). Georgia State University, Atlanta. Retrieved from https://scho.larworks.gsu.edu/msit_diss/133
- Perren, S., Herrmann, S., Iljuschin, I., Frei, D., Körner, C., & Sticca, F. (2017). Child-centred educational practice in different early education settings: Associations with professionals' attitudes, self-efficacy, and professional background. *Early Childhood Research Quarterly*, 38, 137–148. doi:10.1016/j.ecresq.2016.07.001
- Prieto, L. R., & Meyers, S. A. (1999). Effects of training and supervision on the self-efficacy of psychology graduate teaching assistants. *Teaching of Psychology*, 26(4), 264–266. doi:10.1207/S15328023TOP260404
- Prieto, L. R., & Scheel, K. R. (2008). Teaching assistant training in counseling psychology. *Counselling Psychology Quarterly*, 21(1), 49–59. doi:10.1080/09515070801900780
- Rukundo, G. Z., Kasozi, J., Burani, A., Byona, W., Kirimuhuzya, C., & Kiguli, S. (2017). Valued experiences of graduate students in their role as educators in undergraduate training in Ugandan medical schools. *BMC Medical Education*, 17(1), 231. doi:10.1186/s12909-017-1073-2
- Rushin, J. W., De Saix, J., Lumsden, A., Streubel, D. P., Summers, G., & Bernson, C. (1997). Graduate teaching assistant training: A basis for improvement of college biology teaching and faculty development. *American Biology Teacher*, 59(2), 86–90. doi:10.2307/4450255
- Ryan, B. (2014). Graduate teaching assistants; critical colleagues or casual components in the undergraduate laboratory learning? An exploration of the role of the postgraduate teacher in the sciences. *European Journal of Science and Mathematics Education*, 2(2), 98–105. doi:10.21427/D7T045
- Santandreu Calonge, D., Chiu, P. H. P., Thadani, D. R., Mark, K. P., & Pun, C. F. K. (2011). In-service development for graduate teaching assistants: A blended-learning and formative approach. *Journal of University Teaching Learning Practice*, 8(3), 1–26.
- Santandreu Calonge, D., Mark, K. P., Chiu, P. H. P., Thadani, D. R., & Pun, C. F. K. (2013). Extreme-teaching-2 (XT²): Evaluation of an innovative semester-long intensive GTA training program based on microteaching. *International Journal of Teaching and Learning in Higher Education*, 25(1), 129–143.
- Schussler, E. E., Read, Q., Marbach-Ad, G., Miller, K., & Ferzli, M. (2015). Preparing biology graduate teaching

- assistants for their roles as instructors: An assessment of institutional approaches. *CBE Life Sciences Education*, 14(3), 1–11. doi:10.1187/cbe-14-11-0196
- Streveler, R. A. (1993). Investigating differences in TA confidence. In K. G. Lewis (Ed.), *The TA experience: Preparing for multiple roles. Selected readings from the 3rd National Conference on the Training and Employment of Graduate Teaching Assistants at Austin, Texas* (pp. 37–40). Stillwater, OK: New Forums Press.
- Sutherland, S. (1996). *The international dictionary of psychology* (2nd Rev ed.). New York, NY: Crossroad Classic.
- Tollerud, T. (1990). *The perceived self efficacy of teaching skills of advanced doctoral students and graduates from counselor education programs* (Dissertation Abstracts International, 51: 12A). University of Iowa, Iowa City. doi:10.1099/00221287-136-2-327
- Veenman, S. (1984). Perceived problems of beginning teachers. *Perceived Problems of Beginning Teachers*, 54(2), 143–178.
- Wulff, D. H., & Austin, A. E. (2004). *Paths to the professoriate: Strategies for enriching the preparation of future faculty*. San Francisco, CA: Jossey-Bass.



© 2019 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

You are free to:

Share — copy and redistribute the material in any medium or format.

Adapt — remix, transform, and build upon the material for any purpose, even commercially.

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made.

You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

No additional restrictions

You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



Cogent Education (ISSN: 2331-186X) is published by Cogent OA, part of Taylor & Francis Group.

Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com

