A blended approach in a graduate teaching assistants' pre-service course to promote self confidence

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The employment of postgraduate students as graduate teaching assistants (GTAs) to help in the delivery of undergraduate teaching, particularly in laboratories and tutorials has been used for many years throughout higher education institutions, including North America, UK, Australia, and New Zealand and is currently being used in Singapore. However, despite GTAs' sound subject knowledge, research has shown that with their increasing numbers, it is important to provide an effective training course to adequately prepare them for the task of teaching ahead of them. This paper reports on a GTA Preparation Course undertaken by 166 participants in 2006, at Nanyang Technological University, Singapore. The course employed a blended learning approach using video-recorded 'mini-lectures', PBL videoed critical incidents, reflective learning, as well as self study materials through an online Blackboard platform. The blended learning environment facilitated a friendly cooperative space that allowed the flow of the learning process to proceed at its own pace. This environment encouraged self reflection and self evaluation, supported collaborative learning and problem solving skills, and facilitated tasks requiring analyses and evaluation of 'real life' teaching situations. It was considered important that participants experience the blended learning approach modeled in the course in order to encourage them to use a similar model in their own teaching. The course encouraged the use of technology to enhance and enrich student learning and to model active learning activities through video, group work, online materials and recorded presentations. Participants' ratings of the course suggest that this was an effective pedagogy for promoting innovative educational technology and self-confidence in GTA's teaching practice.

Keywords: graduate teaching assistants' preparation; blended approach; ICT; video/educational technology.

Introduction

The employment of postgraduate students as graduate teaching assistants (GTAs) to help in the delivery of undergraduate teaching, particularly in laboratories and tutorials has been used for many years throughout higher education institutions (HEIs) including the North America, UK, Australia, and New Zealand and is currently being used in Singapore. Since HIEs today are increasingly facing the double burden of rising student numbers together with diminishing funding, the GTA model clearly provides a sound educational resource, freeing up research time for academics by reducing their teaching load, offering an apprenticeship model for a future career as an academic, and providing financial support for graduate students (Goodlad, 1997; Park, 2004).

Studies have shown that GTAs generally have a sound grasp of their subject matter, are highly motivated, have acceptable proficiency in teaching, are close to students, and are affordable and flexible to employ. However, as Goodlad (1997: 92) states "subject knowledge alone (of physics, chemistry, biology, and so forth) is not enough; [for GTAs] to feel comfortable with, and confident in, their roles as tutors" it is important to include an effective training course in order to adequately prepare them for the new and often daunting task of teaching ahead of them. Studies have suggested that such courses be delivered at both the departmental and institutional level, be underpinned by a supportive communication relationship between GTAs and the course coordinators, and that they incorporate appropriate experiential activities for GTAs to develop innovative teaching techniques (Goodlad, 1997; Meyers & Prieto, 2000; Park, 2004). For international GTAs, such courses and supportive relationships have been shown to be important in increasing their perceived level of self-confidence in teaching in English (Salinas *et al.,* 1999).

This paper reports on a GTA preparation course taught in small group (10-12), two-hour tutorial sessions, once a week for six weeks at the Centre for Educational Development, Nanyang

Technological University, (NTU) Singapore. The course employed a blended learning approach to develop effective presentational and teaching techniques through video-recorded 'mini-lecture' presentations, PBL videoed critical incidents, and reflective learning.

Participants were nominated for the course by their schools. In 2006, 166 GTAs (18 groups) from all schools: engineering, science, business, communication and humanities completed the course. About 70% of this cohort was international students predominately from China with students also from India, Indonesia, Philippines, Vietnam, and Myanmar.

There are approximately 300 GTAs teaching undergraduate courses in laboratory and tutorial sessions at NTU. Most schools use postgraduate students to teach in laboratories, and some schools use them to teach tutorial sessions and undertake marking. The GTAs are usually selected by the Associate-Chairs Research with advice from the academic supervisors, who are acquainted with the discipline knowledge and skills of the candidates.

Objectives

The learning objectives of the course were described as follows:
Upon completing the course you should:

- Increase your awareness of the importance of a tutor's role
- Improve your teaching skills in tutorial/ laboratory sessions
- Increase your confidence in presenting complex concepts
- Improve your skills in encouraging active learning in students by using innovative technology and activities to engage student learning

It was considered important that participants experience the blended learning approach modeled in the course in order to encourage them to use a similar model in their own teaching. The course encouraged the use of technology to enhance student learning and utilised online materials, videoed critical incidents, group work, and video recorded presentations to engage students.

Assessment

Assessment for the course included an online journal detailing participants' reflections on their teaching practice and suggested innovations to their teaching as a result of those reflections, as well as two video recorded mini lecture presentations:

> 1) 'First Day of Class': an introduction of self, course, assessment, syllabus, as well as the introduction of a concept or procedure.
> 2) 'Explaining a Concept': continue with the concept presented in the first presentation, and/or introduce a new concept/procedure. An important difference with the second presentation was that participants were required to design a group activity or discussion question and to 'involve students' in some way.

Participants used power point for their presentations and were encouraged to include innovative technology, for example videos or animation to enhance student understanding of the concepts presented. As the majority of these students were science and engineering students they were extremely comfortable with technology and used effective animation, graphics and video to enhance the concepts presented. Examples include, a video clip of the way a robot balances itself and walks downstairs, an animation of the mechanisms of a steam engine coupled with an accompanying animated graphic detailing the process, and images of car crashes, hostage taking, and football games to describe Newton's three laws of motion.

Blended learning approach

Technology is recognised as an integral tool for supporting and enhancing teaching and learning in higher education today. The GTA preparation course employed technology to assist in providing a pedagogical environment for participants to actively participate in their learning, both in the tutorial and online space.

> Technological resources can ask for different methods of learning through powerful visuals and well-organised print; through direct, vicarious, and virtual experiences; and through tasks requiring analysis, synthesis, and evaluation, with applications to real-life situations. They can encourage self-reflection and self-evaluation. They can drive collaboration and

> group problem solving. Technologies can help students learn in ways they find most effective and broaden their repertoires for learning. (Chickering and Ehrmann (1996: 4)

Educational technology allowed me to publish class materials online, including lecture slides, interviews with staff and students on teaching and learning theory/practice, previous participants' mini lectures, as well as links to various lecture series. Tutorial activities were 'hands on', interactive, and problem oriented and included conducting, analysing and evaluating the videoed mini-lectures, analysing and solving videoed critical incidents focusing on professional practice, and discussing teaching problems that may have arisen during participants' teaching practice. The blended learning approach was used to engage participants in a collaborative process in which they discussed, analysed, and evaluated the various problems and theories related to teaching practice. By placing the expository teaching materials online for participants to access at their own pace, the tutorial space was freed to move from the traditional lecture approach to a collaborative, active, experiential learning space. Participants used the online expository material to solve problems arising in the critical incident videos, to improve their mini lectures and to provide feedback to their peers.

Critical incident videos

Technology in the form of videoed critical incidents demonstrating general problem issues for faculty and GTAs on campus was used to assist GTAs in preparing for the real life situations that they may encounter in their teaching. These critical incident activities followed a general pattern: I would play the video (e.g. a professor is lecturing in an extremely monotonous tone and students are becoming disruptive, or two teaching assistants are sharing their frustration at the lack of clear grading protocols from their supervising professor) and follow with a series of questions requiring a solution. In working on these critical incidents participants discussed the problem in small groups (4 - 5) and in the course of their discussion used their experience and knowledge from the online material to formulate ideas for solutions. The more experienced GTAs often helped their novice peers by relating their own teaching experience to the problem discussed. Participants also used relevant knowledge from the online material to suggest solutions. In this way, participants were able to actively relate what they were learning to their own experiences of teaching, or to share those experiences with others to assist them in placing the content in the context of their daily teaching activities.

Video recorded mini-lectures

To record the mini-lectures undertaken as part of the assessment, I used *Aculearn*, a video based presentation platform. Participants used a topic from their own teaching and were asked to make the lecture interesting by using innovative technology and developing a related group activity. The first presentation, 'First Day of Class' was to include: an introduction of self, course, assessment, syllabus, as well as the introduction of a concept. If participants were teaching in the laboratories, they included an introduction on the safety procedures in the laboratories and outlined the experiment to be completed. In the second presentation, participants were to continue with the concept presented in the first lecture, and/or to introduce a new concept/procedure and to 'involve students' in some way. Excerpts from previous participants' mini lectures were viewed in class and evaluated. These mini lectures were published online for participants' reference prior to their presentations.

Participants' recorded mini lectures were viewed in class the following week for peer, self, and facilitator evaluation. Particular aspects of teaching practice such as: relating a concept to real-life examples, quality of the presentational media, enhancing a group activity, pace of delivery, pronunciation, projection, etc. were highlighted for improvement. After viewing their first mini-lecture, participants were required to show signs of improvement in the second in the respective problems outlined.

The technology for recording participants' mini lectures proved to be an extremely effective tool in improving participants' confidence in presenting. In the first presentation many participants lacked confidence and were generally stiff, hesitant, and lacking in fluency and good voice projection. One reason for this may have been due to the fact that they were presenting before a camera for the first time. However, after evaluating their own performance and receiving feedback from me and their peers, all participants significantly improved their performance in the subsequent presentation. In the second presentation participants were much more relaxed, their projection and fluency improved, and they appeared to have more fun by injecting their own personality into the presentation and interacting with 'students' more effectively. In terms of technology these students were very comfortable and used effective animation, graphics, and video to enhance the concepts presented.

Online teaching journal

Since GTAs teach in small group tutorial sessions, are closer to undergraduate students' age group, and often teach repeat classes, they are in a good position to observe the learning problems that students face and modify their teaching to improve students' learning experience. Participants were encouraged to seek regular feedback from their students, for example to allow five minutes at the end of each class for their students to anonymously submit questions concerning the concepts taught. These questions could then be reviewed and discussed in their following teaching session (McKeachie, 1999).

For the final part of the assessment participants were required to keep an online teaching journal incorporating reflections focusing on their responses to their teaching practice and innovative changes incorporated in their teaching as a result of those reflections. Since participants were grouped in tutorials by schools, those teaching in related areas shared ideas, problems, and solutions. However, this sharing was predominately confined to the tutorial rather than the online sessions, and was largely prompted by discussions arising from the critical incidents videos (which seemed to trigger reflections of similar incidents in their own teaching experience) or to suggestions for improved interactive group activities in response to participants' mini lectures. Unfortunately, the majority of participants seemed reluctant to post reflections on their teaching online and only a handful of students regularly submitted entries. One reason for this may have been that participants were at various points in their teaching experience: a small minority (5) had not even begun teaching, while the majority had experience ranging from 3 months – 2 years.

In an attempt to encourage participants to reflect online and to improve this area of the assessment, I intend to replace the journal entries with a one-off reflective essay on key points of learning about their strengths and challenges as a GTA and the changes they have initiated in their teaching. This 250 word reflection will be submitted online towards the end of the course for participants' comments. A final reflection on what participants have gained from the course and incorporated into their teaching practice may prove less intimidating for some of the more novice GTAs.

In presenting and evaluating the *Aculearn* mini-lectures, analysing critical incidents and sharing teaching tips participants had the opportunity to gain firsthand experience of teaching theory and practice in a supportive environment. The blended learning environment encouraged a 'hands on' experience to assist participants in applying teaching theory to their everyday teaching lives. It also allowed them to view their own performance and gain confidence in improving their teaching and presentation skills using innovative technology.

Evaluation

Participants in each tutorial group were asked to rate the course on a 4-point scale, with four being the highest possible score. The mean of the ratings for each session for 2006, and the 4-point scale system, are shown in Table I, below. Participants' evaluation of the course and their individual comments were extremely positive and highlight the importance of a preparation course to assist GTAs in gaining confidence in their teaching, in encouraging activity in their students, and in dealing with interpersonal situations. In terms of the overall evaluation, scores on both 'usefulness' and 'satisfaction' achieved at the 3.5 out of a 4-point scale.

Table 1: Participant ratings of GTA Preparation Course 2006
Mean of 4-point scale: [4] Strongly Agree [3] Agree [2] Disagree [1] Strongly Disagree

	January ***n*63/64**	**March** ***n*12/13**	**August** ***n*43/47**	**October** ***n*40/42**
The course objectives were achieved	3.42	3.54	3.52	3.56
The course was relevant and interesting	3.30	3.51	3.44	3.38
I can apply the ideas/skills learnt in my work.	3.41	3.48	3.51	3.56
Explanations were clear	3.74	3.51	3.53	3.53
There was good interaction between the speaker and the participants	3.50	3.88	3.54	3.54
The speaker was well-prepared	3.77	3.68	3.68	3.62
The duration of the course was just right	3.13	3.17	3.33	3.35
Overall				
I have learnt useful ideas	3.54	3.58	3.58	3.55
I am satisfied with the course	3.51	3.56	3.55	3.56

*No. of respondents/No. of participants.

Qualitative comments

In each tutorial group the qualitative comments of participants reflected the ratings of the course indicating that the 'hands on', interactive pedagogy was effective and valued by participants. The video-recorded mini-lectures and the facilitator/self/peer evaluations were specifically mentioned by many participants: "presentations are taped and later discussed, serve as insightful feedback for TAs"; "videotape, though it sounds really unrealistic, it helps with self-reflection, prepares one for teaching in higher education"; "good insights on teaching methods, receiving personalised feedback for our own teaching through presentations"; "video sessions are very helpful in helping to identify strengths and weaknesses and learning from presentations of other students".

The PBL videoed critical incidents were also explicitly highlighted: "it is beneficial for new tutors as the problem activities bring up some issues that we will face in class when we teach"; "stimulating participation through problems, good student / teacher interaction, timely feedback"; "good balance between problem solving group work, lecture and tutor-student integration"; "interactivity, through students discussing problems in groups, including presentations."

The online materials also attracted specific comment: "direct in teaching TAs how to facilitate learning, has a lot of other materials (e.g. videos, audio files and presentation) to teach TAs how certain things should be done"; "good facilitator, effective communication, solid materials (online) for self study".

In terms of improvement for the course there were few suggestions. There was a strong call from international students for a course on English pronunciation, which was initiated in March 2007. There was also a call for less "homework" in the form of the online teaching journal. Some participants felt that there should be more presentations, and others commented that the duration of the course was too short, but given the GTAs' busy schedule these comments were rare.

Overall, there were many appreciative comments: "its well-structured, spans a period of time within which what is learnt can be tried out in actual tutorials simultaneously. It covers some issues and theories in education"; "practical skills are taught, a general conception of teaching is built up"; "interactive and duration is appropriate"; "useful and not boring"; "stimulating participation"; "facilitator's elicitation method of teaching has inspired us and we are able to apply this to many lessons."

Conclusion

Participants' ratings of the GTA preparation course lend support to earlier studies which highlight the importance of a preparation course to provide guidance and support for GTAs in their teaching practice. GTAs need guidance and confidence in presenting complex concepts, and in encouraging activity in students. The course employed a blended learning approach using video-recorded 'mini-lectures', PBL videoed critical incidents, reflective practice, and self study materials through an online Blackboard platform. The blended learning environment encouraged self reflection and self evaluation, supported collaborative learning and problem solving skills, and facilitated tasks requiring analyses and evaluation of 'real life' teaching situations. The technology allowed participants to gain confidence in their teaching skills, particularly in presenting complex concepts, in creating interactive group activities and in dealing with the interpersonal situations that often arise in teaching. Participants' ratings of the course suggest that this was an effective pedagogy for promoting innovative technology in teaching and self-confidence in their teaching practice. With participants' permission, a logical follow-up to the course would be to conduct observations of participants' classes to suggest improvements to their teaching and to further examine the effect of the course on the participants' learning outcomes, i.e. the confidence, awareness and skills described in the learning objectives.

A number of recommendations for further research may be drawn from this study. These include investigating how GTAs engage with technology and the extent to which they are comfortable innovating with technology. Another focus would be the ability for new GTAs to design activities that explore new ways of allowing students to share what they know. Investigation of the experiences of GTA preparation courses in enhancing student interest in pursuing a teaching career is also recommended. Such research would best involve appropriately diverse sample groups and be conducted within a qualitative constructivist epistemology in order to probe individual understandings and responses.

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