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Katherine E. Bishop-Williams
University of Guelph

Kaitlin Roke
University of Guelph

Erin Aspenlieder
McMaster University

Meagan Troop
Sheridan College, meagan.troop@sheridancollege.ca

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Katherine E. Bishop-Williams
University of Guelph, kbishop@uoguelph.ca
Kaitlin Roke
University of Guelph, kaitlin.roke@gmail.com
Erin Aspenlieder
McMaster University, aspenled@mcmaster.ca
Meagan Troop
Sheridan College, meagan.troop@sheridancollege.ca

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Graduate Student Perspectives of Interdisciplinary and Disciplinary Programming for Teaching Development

Abstract

Interdisciplinary (i.e., university-wide programming) and disciplinary (i.e., programming open to participants from one college or department) teaching development programs for graduate students have been used for many years in higher education. Currently, research on the benefits of these teaching models remains scant in terms of a contextualized understanding, and empirical studies are needed. The purpose of this study was to determine graduate students' perspectives related to interdisciplinary and disciplinary teaching and learning experiences. Two online surveys were used: a quantitative survey and a qualitative follow-up survey. Three participatory focus groups were also conducted to allow for further in-depth exploration in both an interdisciplinary and disciplinary group setting that represented seven distinct colleges. Statistical and thematic analyses were conducted with survey responses, and thematic analyses were conducted on focus group data. Similar themes emerged from the survey and focus group data identifying perceived benefits of participation in either interdisciplinary or disciplinary teaching development. Respondents' perceived benefits were related to: (a) becoming a better teacher; (b) social learning; and (c) that while the perceived benefits of the models vary, the outcomes of both experiences are shared. The lived experiences of these graduate students expand the characterization of interdisciplinary and disciplinary programming. This study points to the need for graduate student programs—specifically teaching development offered by educational development units—to provide both interdisciplinary and disciplinary teaching development opportunities that achieve a blend of benefits for learners.

Les programmes interdisciplinaires (c'est-à-dire les programmes offerts à l'échelle de l'université) et disciplinaires (c'est-à-dire ceux qui sont ouverts aux participants d'un collège ou d'un département) de perfectionnement de l'enseignement pour étudiants de cycle supérieur existent depuis de nombreuses années en enseignement supérieur. À l'heure actuelle, la recherche sur les avantages de ces modèles d'enseignement reste très incomplète en matière de compréhension contextualisée et il y a grand besoin de mener des études empiriques. Le but de cette étude était de déterminer les perspectives des étudiants de cycle supérieur liées aux expériences d'enseignement et d'apprentissage interdisciplinaires et disciplinaires. Deux sondages en ligne ont été employés : un sondage quantitatif et un sondage de suivi qualitatif. Également, trois groupes de discussion participatifs ont été organisés afin d'explorer plus profondément les contextes des groupes interdisciplinaires et disciplinaires qui représentaient sept collèges distincts. Des analyses statistiques et thématiques ont été effectuées avec les réponses aux sondages et des analyses thématiques ont été effectuées sur les données recueillies des groupes de discussion. Des thèmes semblables se sont dégagés des sondages et des données recueillies des groupes de discussion. Ces thèmes identifiaient les avantages perçus de la participation dans le perfectionnement de l'enseignement tant interdisciplinaire que disciplinaire. Les répondants ont perçu les avantages suivants : (a) possibilité de devenir de meilleurs enseignants; (b) apprentissage social; et (c) bien que les avantages perçus de chaque modèle varient, les résultats des deux expériences sont semblables. Les expériences vécues de ces étudiants de cycle supérieur élargissent la caractérisation des programmes interdisciplinaires et disciplinaires. Cette étude souligne la nécessité que les programmes pour étudiants de cycle supérieur – spécifiquement les programmes de perfectionnement de l'enseignement offerts dans le cadre d'unités de pédagogie – doivent offrir des occasions de perfectionnement de l'enseignement à la fois interdisciplinaires et disciplinaires pour que les apprenants tirent des deux modèles un mélange d'avantages.

At many post-secondary institutions in Canada, graduate students have access to teaching development aimed at supporting the growth of skills and strategies for effective instruction (Gibbs & Coffey, 2004; Korpan, 2011; Park, 2004). Graduate students participating in teaching at the undergraduate level often report feeling unprepared and unsupervised in their teaching (Gaia, Corts, Tatum, & Allen, 2003; Gardner & Jones, 2011; Kendall & Schussler, 2012). Conversely, when instructors and students alike participate in teaching development, they perform better on several metrics related to undergraduate teaching ability (e.g., student focus vs. teacher focus, enthusiasm, organization, group interactions, rapport, and breadth) (Feldon et al., 2011; Gardner & Jones, 2011; Gibbs & Coffey, 2004). Given the importance of graduate student teaching as a professional development opportunity, an examination of students' preferences for teaching development and programming is warranted.

Graduate students' have varied teaching roles; that is, roles which potentially include supervision, mentoring, facilitating, and grading (Feldon et al., 2011; Kendall & Schussler, 2012; Korpan, 2011; Lewis, 1993; McEwen, 2009; Tallman & Smith, 2014). With these sophisticated range of teaching tasks in mind, the development of instructional skills for graduate students is significant and crucial. Teaching development for graduate students has proposed theoretical benefits which include: (a) engaging learners' prior knowledge and experience, (b) encouraging effective critical thinking, (c) developing multiple perspectives, (d) motivating learners, and (e) constructing meaning in the classroom (Fink, 2013; Gaia et al., 2003; Repko, 2009; Spelt, Biemans, Tobi, Luning, & Mulder, 2009).

There are several teaching development and programmatic models described in the literature, including models that can be characterized as multi-disciplinary, trans-disciplinary, cross-disciplinary, inter-disciplinary, and intra-disciplinary in nature (Mitchell, 2005; Park & Son, 2010; Van den Besselaar & Heimeriks, 2001). These descriptions occur along a continuum, which tends to generate categories that are not always mutually exclusive (Choi & Pak, 2006; Davies & Devlin, 2007; Klein, 1990; Szostak, 2007). Thus, for the purposes of this research, we chose to focus on interdisciplinary and disciplinary dimensions, as these terms were more clearly defined in previous literature (Klein, 1990; Korpan, 2011; Lewis, 1993; Szostak, 2007). According to Jensenius (2012) and Szostak (2007), interdisciplinary is defined as the integration of knowledge and methods drawing from multiple (two or more) perspectives from different disciplines. Further, interdisciplinary can also be described as the combination, involvement, and synthesis of approaches (Choi & Pak, 2006; Jensenius, 2012; Szostak, 2007; Van den Besselaar & Heimeriks, 2001). Disciplinary (or intradisciplinary) reinforces a particular branch of knowledge. Additionally, it could be considered a field of study with specific research questions or similar methodologies (Choi & Pak, 2006; Jensenius, 2012; Stember, 1991; Van den Besselaar & Heimeriks, 2001).

In relation to interdisciplinary teaching development, Gaia et al., (2003) report that interdisciplinary teaching development programs give graduate students a chance to talk with others who like teaching and value it. Disciplinary teaching development may be offered in order to highlight specific skills relevant to a specific department or topic area, such as conducting labs, leading a discussion, or grading written assignments (Lewis, 1993). Overall, there are several factors that will ultimately influence the differences between interdisciplinary and disciplinary teaching development, some of which include: (a) budget constraints within departments; (b) the size of departments; and (c) most importantly, the fact that not all graduate students are encouraged to, or have the opportunity to, teach during their degree (Feldon et al., 2011; Korpan, 2014; McEwen, 2009).

Spelt et al. (2009) emphasize that strong empirical studies are needed to determine the benefits of interdisciplinary and disciplinary teaching development programs with a view to contextualize and operationalize the attributes and nature of teaching and learning in both settings. Building on the existing body of literature in the field, our research aims to (a) identify graduate student participation patterns in teaching development models at the University of Guelph, (b) investigate preferences and rationale for participation in interdisciplinary and disciplinary teaching development models, and (c) empirically evaluate the perceived strengths and weaknesses of interdisciplinary and disciplinary teaching development models for graduate students in higher education.

Method

University Context

The University of Guelph is a research-focused comprehensive institution located in southwestern Ontario. The University of Guelph consists of seven distinct colleges housing a total of 34 academic departments (The University of Guelph, 2015). Departments are collections of programs that are related to the original college structure, although in some instances students' thesis research may more closely relate to those in other departments. The University's strategic mandate agreement and the overarching Better Planet Project highlight a focus on food, environment, health, community, and teaching and learning (The University of Guelph, 2012). The organizational structure at the University of Guelph is rare within Canada, as it exists as a university built on colleges that may predate the school. The colleges are structured to reflect commonalities in expertise rather than other characteristics such as location. Thus, the departments within a college are more similar than those from other colleges.

In a range of both formal and informal contexts, teaching—for the purposes of this study—is a multi-faceted endeavor that encompasses components of instructional design (activities and assessment) and facilitation (mentoring, supervision, lecturing) to varying degrees. Given these essential and varied roles, the development of teaching and instructional skills for graduate students is likewise significant.

Additionally, for the purposes of this research, we focused on interdisciplinary and disciplinary dimensions of teaching and learning. In our investigation, interdisciplinary programming included training or workshops offered to all graduate students university-wide which brought together multiple perspectives from different disciplines. Interdisciplinary programming is generally provided by educational developers through the Department of Open Learning and Educational Support, and is usually voluntary. Disciplinary programming included training or workshops offered to graduate students within one department/faculty/college of study, in accordance with the institutional context and culture. Disciplinary programming may be provided by specific departments or as part of teaching assistant requirements and may not be voluntary. To date at the University of Guelph, the majority of available programming is offered as interdisciplinary, while fewer disciplinary programs exist.

Participants

Graduate students at the University of Guelph were targeted for this investigation. Demographic information such as age, gender, and program level were collected from the

participants after their consent to participate in the research project. This research project was not restricted by age, gender, or field of study. Ethical approval for this investigation was granted from the University of Guelph Research Ethics Board.

Procedure

Graduate students for this study were recruited in various phases. Participants for Survey 1 were recruited via emails and through social media (i.e., Facebook, Twitter). Participants for Survey 2 were recruited from the attendees of a graduate student conference (focused on teaching and learning) and these individuals could participate in the survey during registration, breaks, lunch, and for two weeks following the conference via a reminder email. Participants for the semi-structured focus group discussions were recruited from the same conference during the concurrent sessions via the conference schedule and posters. Draft survey questions were reviewed by graduate students and staff from various academic backgrounds. Qualtrics© survey software was used and surveys were pilot-tested to ensure ease and accuracy of completion.

Online Surveys and Focus Groups

Online surveys. There were two online surveys used in this research project (see Appendixes A and B). The questions and answer options for these surveys were compiled using a combined approach of literature-generated questions and researcher-generated questions. Survey 1 was available for access from 1 March 2015 – 1 July 2015, while Survey 2 was available in September 2015. Graduate students could complete the surveys on their own time, either on a computer, tablet, or smartphone.

Survey 1 focused primarily on the graduate students' perceived level of preparedness to teach, opinions on the most important teaching skills for teaching assistants, and awareness or participation in various teaching development opportunities at the University of Guelph. Survey 2 was informed by Survey 1, and was designed to intentionally elicit opinions, perceptions, preferences, and reflections on various teaching development opportunities at the University of Guelph. Survey 2 asked graduate students to identify participation in interdisciplinary and disciplinary teaching development programs, provide a rationale for participation in such programs, and reflect on the strengths and/or weaknesses of each program design.

Focus groups. Focus groups are commonly used in qualitative research as a data collection strategy whereby groups of people are asked about their knowledge, awareness, beliefs and perceptions on or related to a particular topic (Greenbaum, 1999; Krueger & Casey, 2009). A semi-structured participatory focus group method was thus employed and followed the general guidelines for participatory research set out by Dunkle and Mariner (2013). Materials such as chart paper, post-it notes, and markers were provided as tools to contribute to the participatory focus group. The focus groups were led by graduate students trained in focus group facilitation; the study investigators did not moderate the focus groups to reduce potential bias. Conversations during the focus groups were transcribed by research assistant note-takers, and conversations were not audio-recorded. In order to ensure that note-takers captured all aspects of the conversation, photographs were taken throughout the discussion to corroborate field notes and thus the photos were considered as part of the data analysis. Sessions lasted 50 minutes, in accordance with the conference schedule.

Statistical Analysis

Quantitative analysis. Quantitative data collected from Survey 1, Survey 2, and the focus groups was analyzed using Microsoft Excel® and Qualtrics©. Descriptive statistics involved calculating frequencies, proportions, means, and cross-tabulations of the responses to Survey 1 and for all of the demographic data collected in this research project.

Qualitative analysis. Qualitative analysis was conducted following a modified version of the iterative processes by previous research groups (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006). Our five-step process included: (a) data familiarization; (b) identification of theory-driven and data-driven codes; (c) development of preliminary codes and a coding manual; (d) coding the phrases, comments, and text of the data; and (e) defining and naming themes. Analysis began by scanning the data and counting the number of phrases that were used. Following initial coding, a thematic map was generated and similar codes were collapsed accordingly. Reflection and review of the data and codes used was conducted with the research team to ensure accuracy and reliability of the coding. In the results, participant is abbreviated to "P" and quotations from individuals who completed the online surveys are represented with numbers (e.g., P1), and those that participated in the focus groups are tagged with letters (e.g., PA).

Results

Participant Characteristics

Four of seven colleges at the University of Guelph reflect traditional sciences (biological, veterinary, agricultural, and physical and engineering sciences), and the three remaining colleges are: arts, social and applied human sciences, and business and economics. Graduate students in this study reflect a similar distribution (Table 1). A total of 147 surveys were collected for Survey 1, with a response rate (for all graduate students at the university) of ~7%. A total of 48 surveys were collected for Survey 2, with a response rate (for all students attending the conference) of ~19%.

Participation Patterns in Teaching Development

In Survey 2, participants were asked to list the interdisciplinary and disciplinary teaching development events they had participated in previously. In this format, 70% of respondents were not able to identify the programs they had participated in, and they were not able to identify which teaching development model the program fit. Despite being at an interdisciplinary teaching development conference, 54% of respondents said they had not participated in interdisciplinary teaching development. The respondents (46%) who identified an interdisciplinary teaching development model primarily identified participating in the interdisciplinary teaching development conference (43%), teaching development workshops (11%), or in the graduate teaching course (7%). At the time of the survey, limited disciplinary teaching development programs were available. Only 21% of respondents identified disciplinary programs that they had participated in, primarily consisting of departmental teaching assistant development or orientations (11%). In Survey 1, 78% of respondents reported that they were interested in attending disciplinary teaching development in the future.

Table 1
Participation in Various Stages of Research

	Survey 1 (N=147)		Survey 2 (N=48)		Focus Groups (N=14)	
	N	%	N	%	N	%
Proportion of females	109	74	35	73	10	71
Masters students	84	57	35	73	4	29
Doctoral students	63	42	13	27	10	71
Full-time students	143	97	48	100	14	100
Graduate students in first year of program (semesters 1-3)	63	43	31	65	7	50
Colleges represented (N=7)	7	100	6	86	5	71

Program Preferences and Participation Rationale

Of the respondents who provided an answer for Survey 2 (n=22), interdisciplinary teaching development programming was the preference for 41% of respondents, while disciplinary teaching development was the preference for 27% of respondents. Approximately 23% of respondents preferred both development models equally. To follow, graduate students suggested their preference for the model was because they gained different skills by participating in different development models, they appreciated the multiple perspectives in interdisciplinary teaching, and/or that each model had distinct benefits.

Not surprisingly, nearly 90% of respondents who provided a rationale for participating in any of these programs mentioned improving teaching as a reason to participate. For the respondents who felt that the reasons to participate varied, most respondents suggested that this was because they were learning different skills or because they were learning about teaching in interdisciplinary settings, and learning about disciplinary content in disciplinary teaching development models. One respondent summarized the varying rationales for participating by saying, "Yes, my reasons do vary between the training models because each of these models will enhance a different set of skills and knowledge base relevant to the varying domains they target." (P22).

Perceived Program Strengths and Weaknesses

Graduate students in both surveys and all focus groups were asked to describe the strengths and weaknesses of interdisciplinary and disciplinary teaching development models. Thematic analysis identified three major themes and numerous sub-themes throughout the data. Major themes identified in the data were: (a) learning to teach, (b) social learning, and (c) differences between interdisciplinary and disciplinary program models.

Learning to teach. Respondents commonly identified learning to teach as advantageous in both disciplinary and interdisciplinary models. While learning to teach was recognized commonly as a strength of disciplinary teaching development, it was more often mentioned as a strength of interdisciplinary teaching development (Table 2). Respondents stated that the benefit of interdisciplinary teaching development was not to help them understand what they teach, but rather how and why they teach the way they do. One respondent said, "Interdisciplinary [teaching development] might not make me better at mixing things as a chemist, but it might make me think of why I am mixing these chemicals together." (PR).

Becoming a better teacher was discussed more commonly in surveys than in focus groups (Table 2). Survey respondents identified learning to teach as a strength of interdisciplinary teaching because, "Interdisciplinary practices open your mind to broader concepts that may have been overlooked [in disciplinary teaching]." (P15). On the other hand, learning to teach was a strength of disciplinary teaching development because, "I'd like specific training on how to teach within my discipline (as my career aspirations are to teach within my discipline)." (P8). Thus, depending on the needs of the graduate student, learning to teach could be accomplished in both settings.

Social learning. In the context of this work, social learning was described as a process for learning that included social interactions. Graduate students identified a variety of strengths of interdisciplinary and a singular strength of disciplinary teaching development related to social learning. Interdisciplinary teaching development was commonly identified as an opportunity to learn from individuals in other disciplines, network with other individuals from across the University, practice teaching with different or untrained audiences (that may more closely represent the learners they would be working with), and hear multiple perspectives. In contrast, disciplinary teaching respondents identified disciplinary experts as the only strength related to social learning. Interestingly, when graduate students were asked to identify the key strengths and weaknesses of interdisciplinary and disciplinary teaching development simultaneously, they commonly listed social learning concepts as a strength of one model and a weakness of the alternative (Table 3).

When discussing the opportunity to learn from each other, one respondent said, "Interdisciplinary is the generation of ideas." (PE), and another respondent in the same focus group added, "Challenging your thinking can be the same as generating new ideas." (PAA). There was consensus among the members of this focus group that new ideas related to teaching were an outcome of interdisciplinary teaching development, and that these ideas were generated by learning from one another. The participants highlighted that they may learn from their disciplinary peers in small ways, but that real innovation and new ideas were generated in interdisciplinary contexts.

Networking was another benefit of interdisciplinary teaching development mentioned in all phases of this work. Participants highlighted that in interdisciplinary groups they may "meet new people and make connections" (P10), "network with a greater audience" (P1), or "develop new linkages" (PY). Some participants also noted that the interdisciplinary teaching development increased "the potential for collaboration" (PG). Additionally, some participants felt that interdisciplinary teaching development increased the number of eligible participants on campus so that networking was more effective, and collaborations were more likely. A lack of, or limited opportunities to, network was suggested as a weakness of disciplinary teaching development.

Table 2
Tally of Codes Applied for Relevant Themes

Code	Survey			Focus Groups						Total
	Survey 1- Q23	Survey 2- Q6	Survey 2- Q9	(DIS) Life Sciences	(DIS) Physical Sciences	(INT) Group 1 (1A)	(INT) Group 2 (1B)	(INT) Group 3	1-Minute Paper	
Learning to Teach										**42**
Teaching Theory	7	22	4	0	2	3	0	1	3	42
Social Learning										**169**
Learn from Other Disciplines	18	6	3	4	7	2	2	16	6	64
Networking	8	1	3	2	1	2	3	3	2	22
Different or Untrained Audiences	6	0	2	0	1	0	0	0	0	9
Multiple Perspectives	15	2	7	2	9	4	5	11	8	63
Experts	+0	+0	+0	0	0	1	1	8	+1	11

Code	Survey			Focus Groups						Total
	Survey 1- Q23	Survey 2- Q6	Survey 2- Q9	(DIS) Life Sciences	(DIS) Physical Sciences	(INT) Group 1 (1A)	(INT) Group 2 (1B)	(INT) Group 3	1-Minute Paper	
Differences Between Program Models										**108**
Different Skills	25	4	9	1	1	3	1	0	4	48
Benefits vary (dissimilarity)	+0	+0	6	0	0	3	0	2	+0	8
Specificity	+0	+0	+0	4	13	6	3	26	+0	52
Overlap of Benefits										**20**
Overlap (similarity)	+0	0	1	2	0	1	7	2	7	20

CS= Disciplinary, ID= Interdisciplinary, + Code was developed in a later stage of analysis and re-checked

Table 3
Strengths and Weaknesses of Interdisciplinary Teaching Development Models

Interdisciplinary (*n*=20)					
Strengths			Weaknesses		
Tally	Reason	Example	Tally	Reason	Example
3	Expand Networks	Strengths are that you expand networks and hear alternative or different views	11	Generalizations/ lack specificity	Diluted methods and over generalizations…
7	New/ broad perspective	Strengths include meeting and discussing experiences with TAs from different backgrounds to see other perspectives…	4	Lower relevance	Some workshops may not be relevant to your discipline.
4	New ideas/ strategies	Provides opportunity to learn new teaching strategies and to see how strategies can vary between disciplines.	1	Not enough background information	… difficult to get everyone to the point where everyone can learn at the same level.
1	Deeper teaching conversation	More students to foster conversations and bring up questions you may have…	1	Lacks rigor	Lacks rigor. [full quote]
4	Widely applicable	It is useful for developing widely applicable skills (e.g. how to deal with problematic students, how to give useful feedback in a timely manner, etc.).	1	Surface Level	Weakness: not being able to go deep enough in any particular area.

Graduate students identified a third benefit of social learning in interdisciplinary teaching development models: working with different or untrained audiences, which necessitated developing skills in communication and public speaking and in knowledge translation. These were skills the participants identified as important for teachers. One respondent summarized this strength of interdisciplinary models by saying, "[It] gives me more practice and confidence in discussing my discipline in ways that others could understand." (P2). Another respondent said, "I could learn about what students need who are not necessarily part of my department." (P8).

Finally, the fourth social learning strength of interdisciplinary teaching development models mentioned was the presence of multiple perspectives. Respondents stated that multiple perspectives, "are always informative" (P9), "provide more experiences to draw from" (P18), "develop their learning abilities" (P7), and "see things from a different light" (PJ). In contrast, similar perspectives were identified as a weakness of disciplinary teaching development models (Table 4). In one focus group, multiple or different perspectives was identified as the most important benefit of interdisciplinary teaching development models.

The only social learning strength identified for disciplinary teaching development models was discussed in the focus groups, where some participants identified that they were more likely to hear from an expert in their field in a disciplinary setting than in an interdisciplinary setting. Experts in teaching (e.g., educational developers) were not mentioned in any of these conversations. Participants often saw specialized development and learning from experts as being directly linked, as evidenced by statements like, "You can get specific training from experts in [your] field" (PP), and "drawing on experts within your area [advances] specific skills" (PY).

Differences between program models. Our discussion of differences between program models focuses on the unique benefits of interdisciplinary or disciplinary teaching development, with three subthemes: different skills, distinct benefits, and specificity.

Participants highlighted the different skills they attained in the two teaching development models, primarily discussing these skills in the surveys. In interdisciplinary settings, "different skills" was used to describe the skills learned from participants in other departments, often stated in combination with social learning. One participant captured this idea by stating, "I think different techniques of learning and teaching in different areas are always valuable, because these make us reconsider the position we have [in] our area" (P10). Additionally, different skills and social learning was reinforced by another participant who said, "These events have the potential to inform TAs [and] instructors of new, effective methods of engaging the students that are used by others" (P25). Participants generally described the benefit of different skills in interdisciplinary teaching development as an opportunity to: "open up to methods that are not commonly used in my discipline" (P44), "experience how many of our students are being taught in other classrooms" (P32), "[get] exposure to a variety of teaching skills" (P36), and "develop technical skills" (P26).

With respect to distinct benefits, participants occasionally stated outright the observation that the benefits of participating in the two models of teaching development were different. Generally, these statements were provided later in a focus group or at the end of a survey, likely as a result of thinking specifically about the benefits of the two models separately until that point. For example, P2 said, "I think you get something different out of each model," and P12 echoed this sentiment: "They are useful for different things."

Table 4
Strengths and Weaknesses of Discipline Specific Teaching Development Models

Discipline Specific (*n*=31)					
Strengths			Weaknesses		
Tally	Reason	Example	Tally	Reason	Example
13	Specific	Strengths are that you gain skills in your specific discipline which might be what you're teaching focus is as well.	3	Too Specific	Possibly too focused causing you to miss out on teaching techniques that could be valuable in all settings, even if they are not normally used in that specific discipline.
4	Relevant	All examples and discussions apply.	3	Limited networking	Least opportunity to connect…
1	Efficient	Strength - time efficient…	1	Limited discussions	…limited discussion possibilities.
1	Clear expectations	… more clear expectations for both students and instructors.	3	Fewer new ideas	Least opportunity to … develop innovative/ new ideas for TAships.
1	Good introduction	This is a good introduction to learning what you need to know for your specific work, and the intricacies of your discipline/ department/unit.	5	Perpetuates separation between disciplines	Weakness: silos.
3	Applicable sessions	Strengths include directed sessions that are applicable to those attending and learn from other departments in the college.	4	Fewer perspectives	Cons include that you don't get to learn from other colleges and see what other strategies are effective/used in the university community.
1	More specific resources	Good more specific resources.	1	Participants had similar training	We are often trained similarly.

Specificity was the most commonly discussed sub-theme of differences between program models; specificity emerged in the focus groups and not in the surveys. Specificity was used to describe a benefit of disciplinary teaching development in comparison to interdisciplinary models. Specificity referenced development that accessed disciplinary norms, methods, signature pedagogies and approaches with respect to teaching. Key terms used to describe specificity as a benefit of disciplinary teaching development included: "deeper learning" (PG), "more focused" (PAA), "specialized training" (PI), "in depth" (PW), and "relatable" (PI).

Discussion

The current literature on the strengths and weaknesses of interdisciplinary and disciplinary programming focuses on program evaluation, rather than empirical research (Cooper, Carlisle, Gibbs, & Watkins, 2001; Spelt et al., 2009). To address this gap, in this investigation we asked three distinct research questions of graduate students at the University of Guelph: (a) What teaching development models are graduate students currently participating in?, (b) What are the preferences and rationale for graduate student participation in interdisciplinary and disciplinary teaching development models?, and (c) What do graduate students perceive to be the strengths and weaknesses of interdisciplinary and disciplinary teaching development models? In asking these questions, we found that there were a variety of benefits: some distinctly related to either interdisciplinary or disciplinary teaching development models. Specifically, graduate students discussed their interest in learning to be better teachers, their potential benefiting from social learning opportunities, and their perception of the teaching models as having different benefits. Several important outcomes emerged from the data. Graduate students felt that their skills as teachers improved from the participation in these programs. In addition, there were skills and values related to social learning, which were not intended learning outcomes of these development models. Finally, an analysis of the data suggests that offering both interdisciplinary and disciplinary programming carries the potential to develop a complement of skills, not as likely to occur from participation in only one of the streams.

Educational developers at the University of Guelph and other institutions could consider these data in their own teaching development programming. For example, in many cases universities do not have the capacity to offer disciplinary programming (Park, 2004). However, could aspects of disciplinarity be incorporated into interdisciplinary programming? For instance, small group activities with varied opportunities to discuss with others from similar disciplines might be useful in teaching development programs where only interdisciplinary programming is available. Since many graduate students reported the opportunity to meet others from different backgrounds as a strength of interdisciplinary models, university-wide interdisciplinary programming could begin to both intentionally and explicitly scaffold for interdisciplinary interactions. The addition of a meet and greet or conversational component, incorporating strategic active learning, and ice-breaker activities could allow for these connections and networking opportunities. These components would allow for integration to extend within, across, and beyond disciplinary boundaries.

Participation Patterns

The surveys used for this research project included yes or no questions (Survey 1), and open text boxes (Survey 2). Due to the nature of these questions, we found (not surprisingly) that

participants were less able to identify teaching development programs when answering open text questions. In fact, respondents who completed Survey 2 were currently participating in interdisciplinary teaching development (conference), and often (54%) were unable to identify any teaching development they had participated in. The addition of one-on-one interviews may allow for issues regarding hesitation to answer specific questions to be resolved in future work (Beatty & Willis, 2007). In addition, part of the reason for this discrepancy could be related to the larger cognitive task of recalling information not directly available (Sparrow, Liu, & Wegner, 2011). Prior to answering Survey 1, graduate students may not have been familiar with the differences between the two models. This finding raises the question of whether these workshops should be explicitly marketed as either interdisciplinary or disciplinary in order to increase graduate student awareness of the disciplinary models. However, at this point we do not have sufficient evidence to conclude whether the knowledge of the interdisciplinary or disciplinary nature of a workshop would change graduate student participation or development.

Preferences for Teaching Development Models

Graduate students mainly participated in teaching development programs with the intention of becoming better teachers for the group of learners with whom they work. The reasons for participating were thus not largely self-serving or related to the building of a *curriculum vitae* (CV), but were for the benefit (in many cases) of undergraduate students. This finding was in contrast to previous work, where professional development was rated as a primary reason to participate in interdisciplinary teaching development (Gaia et al., 2003). Given this result, perhaps strategic marketing could be used to appeal to graduate students who are participating in these workshops to satisfy either professional development, building of their CV, self-improvement, and/or improving the quality of their teaching for others.

Strengths and weaknesses of interdisciplinary and disciplinary teaching development models

Social learning benefits of interdisciplinary teaching were learning from each other, networking, and multiple perspectives on teaching issues. The benefits of multiple perspectives were echoed in Gaia et al., 2003. In order to develop as professionals, graduate students need support, ideas, and criticism from peers and colleagues (Sandholtz, 2000). Colleagues were thought to have different ideas based on whether they were disciplinary or interdisciplinary peers.

Our study also validated the proposed social benefit of participating in an interdisciplinary teaching development model (Spelt et al., 2009). With these results in mind, it is important for graduate students to form non-disciplinary relationships, build connections and network outside of their own individual work environment. Therefore, educational development units could serve as a unique environment for the creation and fostering of these relationships.

In terms of disciplinary teaching development models identified in the research, the impact of disciplinary expertise was the exclusive benefit of the disciplinary model for social learning. As noted by a participant, it is possible that when thinking about disciplinary learning, individuals reflect on learning a specific set of knowledge or skills unique to the discipline, skills which may require an expert instructor. In disciplinary contexts, focus on disciplinary expertise allows for the conversations to be more specific, and may allow for more senior graduate students to provide specific feedback and comments. Complicating the issue, however, is the observation in the literature that learning from experts is reported to be a benefit in *both* disciplinary and

interdisciplinary teaching development (Hall & Weaver, 2001; Spelt et al., 2009), which did not match our findings in this study.

Across academic institutions, the perceptions and value of the scholarship of teaching in learning is increasing (Nicholls, 2004). Recently, the University of Guelph implemented the Department of Open Learning and Educational Support. It would be timely for educational developers and some faculty members to make their presence known and increase recognition on university campuses.

Taken together, we find the outcomes of the development programs are similar and both included elements of creativity such as idea generation and deep learning (Figure 1). Offering these programs together may allow for the combination of benefits for the graduate students taking part.
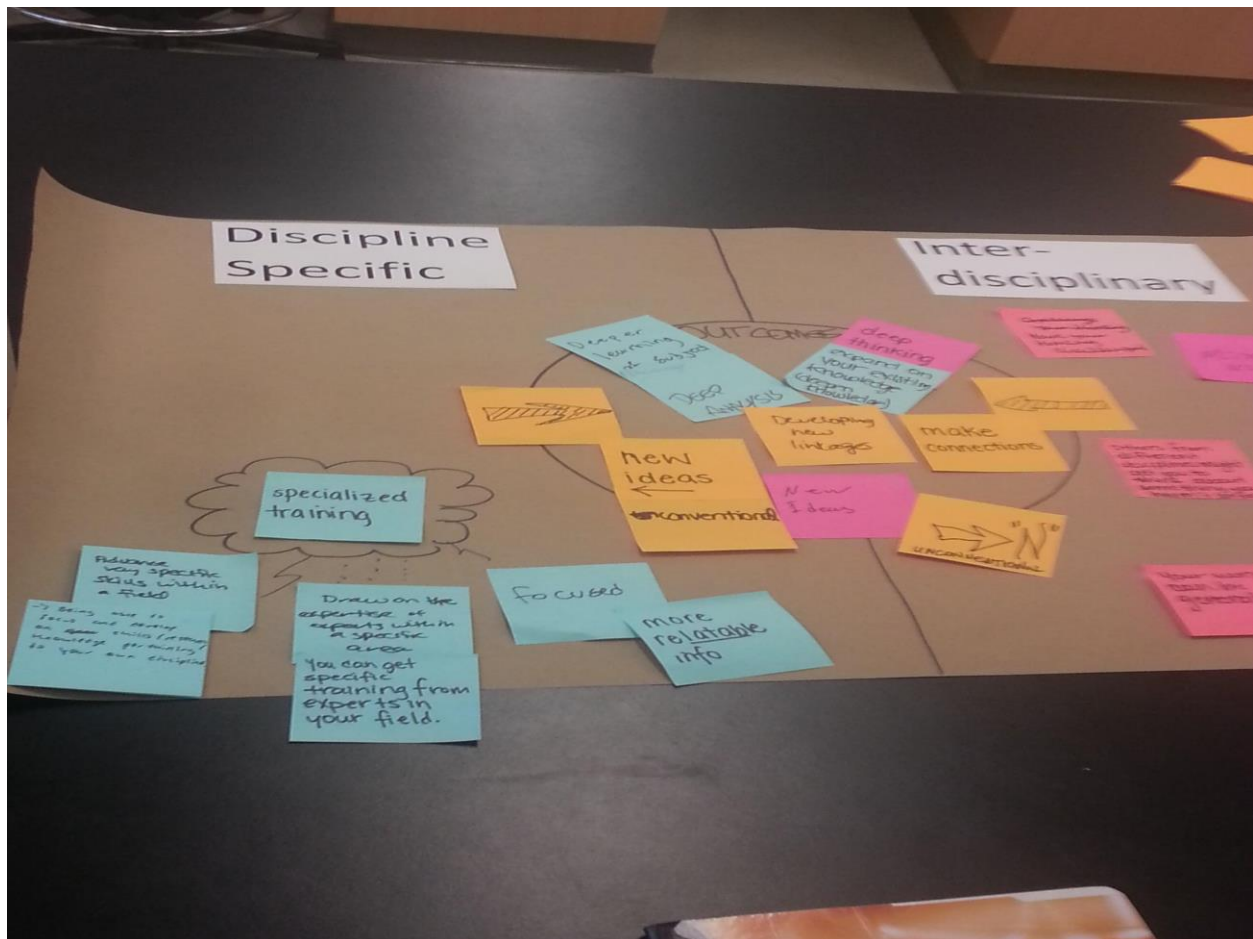

Figure 1. Strengths and weaknesses of discipline specific and interdisciplinary teaching development were discussed in the focus groups. The circle on the diagram represents the outcomes identified by participants that were similar between both teaching development models. Photographs were taken to complement research-assistant notes.

Limitations

The main limitation to this study is the small sample size of graduate students compared with the total number enrolled at the University. Survey 1 had 147 participants, while Survey 2 had 48 participants. To triangulate the data from these surveys, focus group discussions were conducted with 14 participants. However, given the nature of this research we recognize that not all graduate students are interested in participating in teaching development.

Recommendations and Conclusions

The differences between program models of teaching development indicate that the value of each model is unique. Respondents indicated that there was benefit to offering both models, where the outcomes could be complementary. To date, limited research considers together interdisciplinary and disciplinary teaching development models for graduate students. This empirical research thus provides a new comparison of the two models, and suggests that there are both common and unique benefits to these approaches and offering both may be complementary.

In this current research project, we considered interdisciplinary and disciplinary to be separate. Therefore, two potential areas for future research that emerge from our findings include: (a) an examination of faculty and student experiences across a disciplinary continuum that includes intra-, multi-, trans-disciplinary dimensions and (b) an exploration of the intentional design and development process involved in both disciplinary and interdisciplinary programming for educational developers. By having graduate students participate in this range of programming we see an additional benefit—beyond addressing their programming preferences—of exposure to modeling how content can be approached through alternative means. Moreover, through active participation in these intentionally designed environments, there is an invitation to move beyond the content to make pedagogical considerations. As the data suggests, a combination of these development opportunities hold the potential to enable a playful exploration and exchange of ideas related to the how and why of teaching, and an expansion of the current teaching repertoire to include a variety of instructional and assessment approaches that can be transferred and extended to both disciplinary and interdisciplinary contexts.

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Appendix A
Survey 1

Q1 CONSENT TO PARTICIPATE IN RESEARCH [Text removed]

Q2 By checking this box, you will indicate that you have read the information in the consent form and have agreed to participate in this research study.
○ Yes, I agree to participate in this research study (1)
○ No, I do not want to participate in this research study (2)

If No, I do not want to partic... Is Selected, Then Skip To End of SurveyIf Yes, I agree to participate... Is Selected, Then Skip To During your time as a graduate studen...

Answer If By checking this box, you will indicate that you have read the information in the consent form a... Yes, I agree to participate in this research study Is Selected

Q3 During your time as a graduate student, are you planning to apply for a Teaching Assistant (TA) position?
○ Yes (1)
○ No (2)
○ Don't know (3)
If No Is Selected, Then Skip To The next few questions will focus on ...

Q4 How many TA positions have you held in total (including any current positions)?
○ 0 (1)
○ 1 (2)
○ 2 (3)
○ 3 (4)
○ 4 (5)
○ 5 (6)
○ 6 (7)
○ 7 (8)
○ 8 (9)
○ 9 (10)
○ 10 + (11)
○
If 0 Is Selected, Then Skip To The next set of questions explore you...

Q5 What roles have you been responsible for in past or present TA positions?   Please check all that apply, and fill in any other responsibilities
❑ Attending lectures (1)
❑ Conducting labs/ seminars (2)
❑ Grading (3)
❑ Invigilating Exams (4)
❑ Office hours (5)
❑ On-line discussion boards (6)
❑ Orientation/ Training (7)
❑ Preparation of course materials or lectures (8)
❑ Student Consultation (9)
❑ Supervisor/ TA Meetings (10)
❑ Supervising field trips (11)
❑ Other (please specify): (12) _____

Q6 Did you prepare before the semester began for your most recent TA position?
❍ Yes (1)
❍ No (2)
❍ I prepared for this role in previous semesters but not presently (3)

If a. Yes Is Selected, Then Skip To If yes,   In what ways, if any, did y...If a. Yes Is Not Selected, Then Skip To How prepared did you feel before begi...

Answer If Did you prepare before the semester began for your most recent TA position?<o:p></o:p> a. Yes Is Selected

Q7 If yes, In what ways, if any, did you prepare for your TA role?   Please check all that apply
❑ Attended the Graduate Student University Teaching Conference (GSUTC) (1)
❑ Discussed with colleagues (2)
❑ Learned the course material (3)
❑ Met with people who have previously been a TA for the course (4)
❑ Reviewed course notes from taking the course (5)
❑ Talked to the instructor for the course (6)
❑ Took a workshop offered by the Graduate Student Learning Initiative (GSLI) (7)
❑ Took a workshop offered by Open Learning and Educational Support (OpenEd) (8)
❑ Other (please specify): (9) _____

Q8 How prepared did you feel before beginning your most recent TA position? 0 - not sure1 - not at all prepared 10 - very prepared
- ⭘ 0 (0)
- ⭘ 1 (1)
- ⭘ 2 (2)
- ⭘ 3 (3)
- ⭘ 4 (4)
- ⭘ 5 (5)
- ⭘ 6 (6)
- ⭘ 7 (7)
- ⭘ 8 (8)
- ⭘ 9 (9)
- ⭘ 10 (10)

Q9 The next set of questions explore specific skills.

Q10 In your opinion, what skills do you think are MOST important for Teaching Assistants to have?   * You may select up to 3 skills.
- ❑ Becoming more efficient while grading (1)
- ❑ Confidence when discussing with course instructor or students (2)
- ❑ Conflict resolution/ dealing with uncomfortable situations (3)
- ❑ Leading discussions (4)
- ❑ Monitoring the discussion board (5)
- ❑ Providing more effective feedback (6)
- ❑ Providing one-on-one consultation (7)
- ❑ Time management (8)
- ❑ Other (please specify): (9) _____
- ❑ Not applicable (10)

Q11 What skills do you want to develop or improve as a Teaching Assistant or Instructor?   * You may select up to 3 skills.
- ❑ Becoming more efficient while grading (1)
- ❑ Confidence when discussing with course instructor or students (2)
- ❑ Conflict resolution/ dealing with uncomfortable situations (3)
- ❑ Leading discussions (4)
- ❑ Monitoring the discussion board (5)
- ❑ Providing more effective feedback (6)
- ❑ Providing one-on-one consultation (7)
- ❑ Time management (8)
- ❑ Other (please specify): (9) _____
- ❑ Not applicable (10)

The next few questions will focus on current programs, events and resources.

Q12 Prior to this survey, had you heard of the Teaching Assistant Advisory Council (TAAC)?
○ Yes (1)
○ No (2)
○

If a. Yes Is Selected, Then Skip To If yes,   Where did you see / hear...If b. No Is Selected, Then Skip To Have you heard of the Peer Feedback P...

Answer If Prior to this survey, had you heard of the Teaching Assistant Advisory Council (TAAC)?<o:p></o:p> a. Yes Is Selected

Q13 If yes, Where did you see / hear about the TAAC? Please check all that apply.
❏ Colleague or friend (1)
❏ Department emails (2)
❏ Emails from OpenEd (3)
❏ Graduate Student University Teaching Conference (GSUTC) 2014 (4)
❏ OpenEd Website (5)
❏ Posters in your department (6)
❏ TAAC Events (7)
❏ TAAC Website (8)
❏ Other (please specify): (9) _____

Q14 Have you heard of the Peer Feedback Program?
○ Yes (1)
○ No (2)
○

If a. Yes Is Selected, Then Skip To If yes,Where did you see / hear about...If b. No Is Selected, Then Skip To If yes,Where did you see / hear about...

Answer If Have you heard of the Peer Feedback Program? a. Yes Is Selected

Q15 If yes,Where did you see / hear about the Peer Feedback Program? Please check all that apply
❏ Colleague or friend (1)
❏ Department emails (2)
❏ Emails from Open Ed (3)
❏ Graduate Student University Teaching Conference (GSUTC) 2014 (4)
❏ OpenEd Website (5)
❏ Posters in your department (6)
❏ TAAC Events (7)
❏ TAAC Website (8)
❏ Other (please specify): (9) _____

Q16 Have you ever attended the Winter TA Workshop Series hosted by the TAAC?
❍ Yes (1)
❍ No (2)
Q17 Have you seen or used a Tip Sheet created by the TAAC?
❍ Yes (1)
❍ No (2)

Q18 What is the BEST way to reach you about programs, events or resources created by the TAAC? Select ONE response
❍ Email from OpenEd (1)
❍ Email from your Graduate Secretary (2)
❍ Facebook/ Twitter/ Social Media (3)
❍ GSA reps (4)
❍ Posters (5)
❍ TAAC Department Reps (6)
❍ Other (please specify): (7) _____
❍ Not interested being contacted or reached (8)

Q19 Potential programs, events, or resources

Please read the following descriptions before answering the next set of questions.

The TAAC Network—The TAAC network is a proposed mentoring framework, wherein a group of experienced graduate TAs intentionally mentor new TAs. With an aim to support and foster the development of TAs at the U of G, this network would potentially offer interested students an opportunity to apply for paid positions. There would be a series of paid positions that would require approximately 5-10 hours per week depending on your role. Responsibilities could range anywhere from designing and facilitating workshops to organizing the annual graduate student conference to serving as a co-chair of the TAAC network.

Winter TA Workshop – Typically offered in January at the beginning of the Winter semester, the workshop series includes a keynote presentation by an educational developer at OpenEd. The workshops designed and facilitated by TAAC members include 2 concurrent sessions with topics for both new and experienced TAs. This workshop is offered as a complement to the Summer Graduate Student University Teaching Conference (GSUTC).

Peer Feedback Program – By registering for this program, a graduate student trained in providing feedback will attend your seminar, lab, guest lecture, on campus conference presentation, and/or practice thesis talk to give you feedback. Feedback ranges from slide layout to tone of voice and clarity to student engagement.

Practice Makes Perfect – This program has not been offered yet but is a possible activity for upcoming semesters. This day would allow for graduate students with upcoming presentations (conference, thesis, department seminar etc) to give their presentation to other graduate students and receive feedback. This would be a good opportunity to polish a presentation prior to the formal presentation.

TA Meet and Greet: This event is relaxed and intended to allow open conversations about questions and challenges experienced in current or past TA positions. This event encourages interdisciplinary conversations and allows for graduate students to share their experiences and learn new things from others.

Q20 Please rank the programs / events according to what you would you be most likely to attend. 1 - most likely   If you are not interested in any of these events, please select "None of the options listed" as 1.
_____ Peer Feedback Program (1)
_____ Practice makes Perfect – oral presentation feedback day (2)
_____ TA Meet and Greet (3)
_____ TAAC Network (4)
_____ Winter TA Workshop (5)
_____ None of the options listed (6)
_____ Other (please specify) (7)

Q21 Which of these TAAC resources would you find MOST valuable if available?
❍ Informational video (example, peer feedback program video) (1)
❍ TAAC email address to ask questions about teaching and learning (2)
❍ TAAC Website (3)
❍ Tip sheets (ranging from active learning techniques, to campus resources) (4)
❍ None of the options listed (5)
❍ Other (please specify): (6) _____

Q22 The next few questions will ask about potential involvement opportunities.

Q23 Would you be interested in volunteering with the TAAC?
❍ Yes (1)
❍ No (2)
❍ Not sure (3)

Q24 Would you be interested in a paid position with the proposed TAAC network?
❍ Yes (1)
❍ No (2)
❍ Not sure (3)

If a. Yes Is Selected, Then Skip To If yes, If you were ...If a. Yes Is Not Selected, Then Skip To If yes, If you were ...

Answer If Would you be interested in a paid position with the proposed TAAC network? <o:p></o:p> a. Yes Is Selected

Q25 If yes, If you were interested in a paid position with the TAAC network, which positions below may be desirable to you?Select up to THREE (3) most desirable to you
❑ Being part of the organizing committee for the GSUTC (Graduate Student University Teaching Conference) (1)
❑ Co-chair of the TAAC network (2)
❑ Developing print and on-line resources for the TA's across campus (3)
❑ Organizing and running the annual graduate student conference (4)
❑ Planning and facilitating interdisciplinary workshops (5)
❑ Planning and facilitating workshops in my department (6)
❑ Other (please specify): (7) _____
❑ None of the above (8)

Q26 Are you interested in department or college specific events related to teaching and learning?
○ Yes (1)
○ No (2)
○ Not sure (3)

Q27 In what ways, if any, might interdisciplinary events be advantageous to your development as a TA / instructor? If you are not sure please type NA

Q28 Demographic Questions
The following questions will be used for statistical purposes.

Q29 What gender do you most identify with?
○ Male (1)
○ Female (2)
○ Other (3)
○ Prefer not to answer (4)

Q30 What college are you affiliated with?
○ Ontario Agriculture College (1)
○ College of Arts (2)
○ College of Biological Science (3)
○ College of Management and Economics (4)
○ College of Physical and Engineering Science (5)
○ College of Social and Applied Human Sciences (6)
○ Ontario Veterinary College (7)
○ Prefer not to answer (8)

Q31 What degree program are you currently enrolled in?
- ○ Undergraduate (1)
- ○ Masters (coursework) (2)
- ○ Masters (thesis) (3)
- ○ Doctoral (4)
- ○ Post-doctoral Fellow (5)
- ○ Sessional/adjunct instructor (6)

If Post-doctoral Fellow Is Selected, Then Skip To Please complete the following questio...If Sessional/adjunct instructor Is Selected, Then Skip To Please complete the following questio...

Answer If What degree program are you currently enrolled in?<o:p></o:p> Post-doctoral Fellow Is Not Selected And What degree program are you currently enrolled in?<o:p></o:p> Sessional/adjunct instructor Is Not Selected

Q32 Are you enrolled as a part time or a full time student?
- ○ Part time (1)
- ○ Full time (2)

Q33 What semester of your studies are you currently in? e.g. year 2 of Masters (you could be in semester 5)

Q34 Please complete the following question below in order to be eligible to enter a draw to win one of the prizes. This question is added to ensure that this prize draw will not be hacked by a computer.

Q35 Please enter your email if you would like to be entered into a draw for a chance to win 1 of 6 $10 University of Guelph Hospitality gift cards.
If you would not like to enter the draw, please type NA

Q36 Thank you very much for taking the time to complete this survey.

If you are interested in learning more about the TAAC, or checking out our current events and resources, please visit us at www.uoguelph.ca/taac. You can also send us an email at taac@uoguelph.ca. We are happy to hear from you!

If you have any additional comments, thoughts or suggestions please include them in the box below.

Appendix B
Survey 2

Q1 CONSENT TO PARTICIPATE IN RESEARCH   [Text removed]
❍ Next Page (1)

Q2 PURPOSE OF THE STUDY [Text removed]
❍ Yes, I agree to participate in this research study (1)
❍ No, I do not want to participate in this research study (2)

If No, I do not want to partic... Is Selected, Then Skip To End of Survey

Q3 In this survey, a training model refers to a type of teaching and the environment the training happens in. An interdisciplinary training model refers to training that is open to students from across the university campus. A college specific model refers to training that is open to students within a single college, and includes students from multiple departments within the college. A discipline specific model refers to training that is open to students in a single department of the university.

Q4 What, if any, interdisciplinary TA programming have you attended? If none, please type "none".

Q5 What, if any, college specific TA programming have you attended? If none, please type "none".

Q6 What, if any, discipline specific TA programming have you attended? If none, please type "none".

Q7 What are the reasons that you participate in these trainings? Please explain.

Q8 Do these reasons vary between the different training models (i.e. interdisciplinary, college specific, or discipline specific)? Please explain.

Q9 What type of training model do you most prefer?
❍ Interdisciplinary (1)
❍ College specific (2)
❍ Discipline specific (3)
❍ All of the above (4)
❍ Don't know (5)

Q10 Why do you prefer this type of training model? If unsure, please leave blank.

Q11 What are the strengths and/or weaknesses of interdisciplinary TA trainings? Please explain. If none, please type "none".

Q12 What are the strengths and/or weaknesses of college specific TA trainings? Please explain. If none, please type "none".

Q13 What are the strengths and/or weaknesses of discipline specific TA trainings? Please explain. If none, please type "none".

Q14 Is there anything else you want to say about TA training at the University of Guelph? If no, please type "NA".

Q15 Did you complete the TA programming, training, and events online survey (Graduate TA survey) in March-June of 2015? Note: Your results cannot be matched to your previous survey.
- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Q16 What gender do you most identify with?
- ○ Male (1)
- ○ Female (2)
- ○ Other (3)
- ○ Prefer not to answer (4)

Q17 What college are you primarily affiliated with?
- ○ College of Biological Sciences (1)
- ○ College of Management and Economics (2)
- ○ College of Physical and Engineering Sciences (3)
- ○ College of Social and Applied Human Sciences (4)
- ○ College of Arts (5)
- ○ Ontario Agriculture College (6)
- ○ Ontario Veterinary College (7)
- ○ Prefer not to answer (8)

Q18 What degree program are you currently enrolled in?
- ○ Undergraduate (1)
- ○ Masters (coursework) (2)
- ○ Masters (thesis) (3)
- ○ Doctoral (4)
- ○ Post-doctoral fellow (5)
- ○ Sessional/ Adjunct instructor (6)

Q19 Are you enrolled as a part time or a full time student?
- ○ Part-time (1)
- ○ Full-time (2)
- ○ Prefer not to answer (3)

Q20 How far into your current degree are you?
- ○ First year (semesters 1-3) (1)
- ○ Second year (semesters 4-6) (2)
- ○ Third year (semesters 7-9) (3)
- ○ Fourth year or higher (semester 10 or higher) (4)
- ○ Prefer not to answer (5)

Q21 Please note there is no box to enter your email address on the last page. To be entered into the draw for one of 3 $10 Hospitality Gift Cards. Please enter a ballot in the box at the GSUTC Poster Session to be entered in the draw.