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Collaboration, Competencies and the Classroom: A Public Health Approach

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Abstract

The University of Guelph Master of Public Health program is a professional degree program that seeks to prepare graduates to meet complex public health needs by developing their proficiency in the 36 public health core competencies. Provision of experiential learning opportunities, such as a semester-long practicum, is part of student development. In the Fall 2013 semester, a new opportunity was introduced in which small groups of students were paired with local public health professionals to complete a capstone business plan assignment that addressed a current public health issue. However, the impact of this external collaboration on the student learning experience was unknown. To address this, quantitative and qualitative information about students' perceived proficiency in the core competencies and their learning experiences was collected using a pre/post survey and focus groups, respectively. A post-assignment survey was also administered to participating local public health professionals in which they assessed their group's proficiency in the core competencies, and provided additional feedback. The results of this study showed that students had unique learning experiences with enhanced proficiency in different areas including policy and program planning, implementation and evaluation, assessment and analysis, and partnerships, collaboration and advocacy. Managing and communicating expectations was important throughout the learning experience. By using realistic community-based assignments, graduate public health programs can enrich students' learning experiences by creating an environment for students to apply their classroom knowledge and gain practical knowledge and skills.

Le programme de maîtrise en santé publique de l'Université de Guelph est un programme menant à l'obtention d'un grade professionnel qui prépare les diplômés à répondre aux besoins complexes en santé publique et leur permet d'acquérir 36 compétences principales en santé publique. Le développement des étudiants comprend des occasions d'apprentissage par l'expérience, telles que des stages d'une durée d'un semestre. Au cours du semestre d'automne 2013, une nouvelle occasion a été inaugurée, selon laquelle de petits groupes d'étudiants ont été jumelés avec des professionnels en santé publique de la localité afin de mettre au point un plan d'affaires cadre qui réponde à une question de santé publique qui se posait à ce moment-là. Toutefois, l'impact de cette collaboration externe sur l'apprentissage des étudiants restait inconnu. Pour répondre à cette question, des renseignements quantitatifs et qualitatifs sur la manière dont les étudiants ont perçu l'acquisition de leurs compétences dans les domaines principaux de compétences, ainsi que des détails sur leurs expériences d'apprentissage, ont été recueillis par le biais de sondages menés avant et après l'expérimentation ainsi que par des groupes cibles. Un sondage mené après l'expérimentation a également été mené auprès des professionnels en santé publique de la localité, dans lequel ceux-ci ont évalué les acquisitions de leur groupe dans les compétences principales, et ont fourni des commentaires supplémentaires. Les résultats de cette étude ont montré que les étudiants ont vécu des expériences d'apprentissage uniques qui ont amélioré leurs compétences dans divers domaines, y compris la planification de programmes et de politiques, la mise en oeuvre et l'évaluation, l'estimation et l'analyse, ainsi que les partenariats, la collaboration et le rôle de la promotion. La gestion et la communication des attentes ont été importantes tout au long de l'expérience d'apprentissage. Le fait d'utiliser des tâches réalistes basées dans la communauté permet aux programmes de santé publique de cycles supérieurs d'enrichir l'expérience d'apprentissage des étudiants car cela crée un environnement dans lequel les étudiants mettent en application des connaissances apprises en salle de classe et acquièrent des connaissances et des compétences pratiques.

The Public Health Agency of Canada (2007) defines public health competencies as the "essential knowledge, skills and attitudes necessary for the practice of public health" (p. 1). There are 36 public health core competencies (Core Competencies) that are organized into seven categories:

1. Public Health Sciences (5 competencies)
2. Assessment and Analysis (6 competencies)
3. Policy and Program Planning, Implementation and Evaluation (8 competencies)
4. Partnerships, Collaboration and Advocacy (4 competencies)
5. Diversity and Inclusiveness (3 competencies)
6. Communication (4 competencies)
7. Leadership (6 competencies)

These professional competencies were developed, in part, to inform the development of Master of Public Health (MPH) program curriculum (Public Health Agency of Canada, 2007). Including a competency-based curriculum is one of the criteria in the *Guidelines for MPH Programs in Canada*, a guiding document for the development of graduate public health education in Canada (Public Health Human Resources Task Group, 2009). Competency-based curricula have similarly been espoused by several other organizations including the Association of Schools of Public Health in the United States (Calhoun, Ramiah, Weist, & Shortell, 2008), the Australian Network of Public Health Institutions (Genat & Robinson, 2010), and the Association of Schools of Public Health in the European Region (Birt & Foldspang, 2011). These curricular frameworks are based on the acquisition and demonstration of proficiency in defined public health competencies.

Competency statements explicitly describe what one should be able to do and have been used to design public health curriculum (Genat & Robinson, 2010; Kaprielian et al., 2013; Koo & Miner, 2010; Thompson, Harver, & Eure, 2009). These statements can provide a clear target that aligns course content, sequencing, instructional methods, and assessment methods across an entire program (Koo & Miner, 2010; Thompson, Harver, & Eure, 2009). In the public health workplace, competency statements have been used as a self-assessment tool. The Canadian Institute of Public Health Inspectors, the Public Health Agency of Canada, and the Public Health Foundation have promoted the use of their competency statements for assessment and identification of individual training needs (Public Health Agency of Canada, 2007; Public Health Foundation, 2014; The CPC Working Group, 2009). By providing clear, measurable standards, competency statements can be effectively used for critical self-reflection, and to encourage life-long learning.

The University of Guelph MPH program is a professional degree program in which students complete nine required and three elective courses, and one practicum over four to five semesters. The curriculum is designed to give students broad exposure to several areas of public health. Faculty provide particular expertise in epidemiology, environmental public health, and infectious disease. Since its launch in 2008, the number of applications has increased eight-fold from 43 applications for the September 2009 cohort to 343 applications for the September 2014 cohort. However, enrollment has been intentionally capped to keep class sizes small with approximately 20 students per cohort.

As part of the curriculum, students are required to complete the Public Health Administration course, typically in their fourth semester after they have completed their

practicum. The course focuses on the development, implementation, and evaluation of public health programs, and explores the role of stakeholders and community advocacy. For a list of the course learning outcomes, see Appendix 1. Student assessment is comprised of an individual case study (30%) and a capstone assignment in which groups of 4-5 students work collaboratively to develop a business plan (midterm outline – 20%; final paper and presentation – 50%). Previous work by Papadopoulos, Britten, Hatcher, & Rainville (2013) showed that the development of a business plan requires proficiency in all 36 of the Core Competencies, validating it as a capstone experience.

In the Fall 2013 semester, the business plan assignment was modified to include collaboration with project leaders from a local public health organization. Given that previous cohorts had not collaborated with a local public health organization to develop a business plan, the authors were interested in understanding how external collaboration may impact student proficiency in the Core Competencies. The objective of this study was to assess the impact of a new external collaborative capstone experience on MPH students' perceived proficiency in the Core Competencies using quantitative and qualitative data obtained from students and public health professionals.

Methods

Study Population

Twenty-three MPH students were enrolled in the Fall 2013 Public Health Administration course and were invited to participate in the study via e-mail. This study consisted of a pre-assignment and post-assignment survey. Two students (8.7%) requested to be removed from the study population. Of the remaining 21 students, 16 students (76%) responded to the pre-assignment survey. Of these 16 students, 11 students (52%) responded to the post-assignment survey. All of the survey respondents were in their second year of the MPH program.

Public health professionals from a local public health organization supervised five student groups of 4-5 students each. All of the professionals were from the same health analytics and promotion program, and were recruited by the program manager who facilitated communication between the organization and AP as the course instructor. Project leaders were responsible for setting project goals and objectives in collaboration with students, providing contextual information related to the host organization, and ensuring that the business plans remained realistic and achievable. Project leaders were invited to complete a survey after the assignment was completed. Five project leaders representing all five groups responded to the survey yielding a response rate of 100%. Students and project leaders were familiar with the Core Competencies. Students were introduced to the Core Competencies at the beginning of the MPH program. Project leaders were familiarized with the Core Competencies as part of their professional orientation.

Description of the Business Plan Assignment

As part of the Public Health Administration course, students were required to select a public health issue from a pre-determined list that was developed by the local public health organization and course instructor. Students organized themselves into five groups of 4-5 students each. Each group collaborated with a public health professional from a local public

health organization to prepare a business plan that addressed their selected public health issue. Over the course of the semester, students received instruction on strategic planning, business planning, program evaluation, and finance and budgeting to scaffold their learning for this assignment. The selected issues were: (a) uptake of the human papillomavirus vaccine among Grade 8 girls; (b) enhancing the data coordinator position within a local public health unit; (c) enhancing community oral health; (d) increasing the number of domestic animals vaccinated against rabies; and (e) preventing heat-associated illness in the elderly and chronically ill, low-income individuals. Students had from October 1 to December 3 to complete the assignment. Any required resources were provided by the local public health organization such that there were no additional costs to the university. See Appendix 2 for the assignment outline.

Quantitative Survey Instrument and Data Collection

Three electronic surveys were created using LimeSurvey: (a) anonymous pre-assignment student survey; (b) anonymous post-assignment student survey; and (c) identifiable post-assignment project leader survey. All three surveys assessed proficiency in 35 of the 36 Core Competencies on a 10-point Likert scale with the three scale anchors 1 representing "needs improvement," 5 representing "good," and 10 representing "outstanding" proficiency. This scale was generated by the authors, and used 10 points (rather than 5 or 7 points) to increase scale granularity. Competency 3.8 – *"Demonstrate the ability to fulfill functional roles in response to a public health emergency"* – was not included as it was not applicable to this assignment. The competency statements used in the survey were previously validated and published by the Public Health Agency of Canada (Public Health Agency of Canada, 2007). The pre-assignment student survey was disseminated in October 2013 via e-mail. The survey also assessed level of experience with generating a business plan and collaborating with a public health organization outside of their practicum placement using a three-point scale with the scale anchors of unexperienced, somewhat experienced and very experienced. The post-assignment surveys were disseminated at the end of November 2013 via e-mail. The survey also assessed frequency of communication, and agreement with value statements related to generating a business plan and collaborating with a public health organization on integration into the public health sector, job readiness, graduate studies, and achieving the course learning outcomes. Agreement was assessed on a five-point Likert scale ranging from strongly disagree to strongly agree. Although assignments were not due until December 3, we administered the post-assignment survey slightly in advance of the due date to promote completion of the survey prior to the end of the semester. E-mail communication with students and student survey data collection was managed by a third person (AC) who had no relationship with the students in order to avoid a conflict of interest given that the first author (LEW) was the course teaching assistant, and the second author (AP) was the course instructor. To facilitate dissemination of the post-assignment survey to only those students who had completed the pre-assignment survey, a token table was used by AC to determine who had submitted the pre-assignment survey. The token table did not link participant names to their responses such that the responses themselves were anonymous.

Qualitative Focus Groups and Data Collection

A convenience sample of ten students were invited to participate in a follow-up focus group session, of which seven agreed to participate, yielding a response rate of 70%. The

convenience sample was selected based on students who were still enrolled in the MPH program or were known by LEW or a current MPH student to be geographically close to the University of Guelph. By using a convenience sample, we were able to maximize the accessibility of participants. Two semi-structured focus groups were conducted in March and April 2014 at the University of Guelph with 3 and 4 students, respectively. All but one of the focus group participants, who had graduated in February 2014, were currently enrolled in the MPH program at the time of the focus group session. Topics that were included for discussion were: Initial thoughts about the assignment, purpose of the assignment, public health core competency categories that students most and least improved in, specific competencies that students most and least improved in, frequency and sufficiency of contact with their project leader, benefits and drawbacks of generating a business plan and, benefits and drawbacks of collaborating with a public health organization. The average duration of these sessions was 56 minutes. Both sessions were conducted in English by LEW, audiotaped, and transcribed verbatim by LEW.

Data Analysis

Quantitative student survey results were analyzed using Excel and Stata13 (StataCorp LP, 2015). Incomplete surveys were excluded from analysis. To assess change in student proficiency across the 35 Core Competencies, we applied a cut-off of 7 out of 10, and determined the proportion of respondents who were at or above the cut-off pre- and post-assignment. The absolute difference between the pre- and post-assignment proportions was calculated to determine the change in those who were at or above the cut-off after the assignment was completed. Pre- and post-assignment proportions and their differences were sorted and ranked, and median values were determined. Proportions were converted to percentages. Of note, we did not calculate mean scores as it is not statistically appropriate to compute means for ordinal data. Additional survey results were analyzed using descriptive statistics. Quantitative project leader survey results were analyzed using Excel. Descriptive statistics were used to describe the distribution of scores across the 35 Core Competencies for each group. Focus group transcripts were analyzed using a basic qualitative approach to identify common themes, and triangulate quantitative survey data (Merriam, 2014). Briefly, a basic qualitative approach, in this context, sought to uncover how students interpreted their experience in collaboratively constructing a business plan, and assigned meaning in relation to their proficiency in the Core Competencies. Focus group transcripts were open-coded using the software program, ATLAS.ti (ATLAS.ti Scientific Software Development GmbH, 2002). Codes were organized by question, and analyzed to identify emergent cross-cutting themes. Qualitative responses relating to competency categories that participants felt that they most and least improved in were quantified and expressed as percentages. Qualitative analysis was conducted by LEW.

This study was approved by the University of Guelph Research Ethics Board.

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Results

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Level of Prior Related Experience

Prior to the assignment, all respondents were inexperienced in creating a business plan. Outside of their practicum placement, 63% and 37% of respondents said that they were inexperienced and somewhat experienced in collaborating with a public health organization,

respectively. Those who had some experience in external collaboration had gained it through volunteer work, undergraduate co-operative placement, or previous work experience.

Perceived Proficiency in the Core Competencies

Prior to the assignment, using a cut-off score of 7 out of 10, competency 5.1 – "*Recognize how the determinants of health (biological, social, cultural, economic and physical) influence the health and well-being of specific population groups*" had the greatest percentage of respondents at or above the cut-off (81%) (see Figure 1). In contrast, competencies 3.3 – "*Develop a plan to implement a course of action taking into account relevant evidence, legislation, emergency planning procedures, regulations and policies,*" 3.4 – "*Implement a policy or program and/or take appropriate action to address a specific public health issue,*" and 6.3 – "*Mobilize individuals and communities by using appropriate media, community resources and social marketing techniques*" had the lowest percentage of respondents at or above the cut-off (19%). The median percentage of respondents at or above the cut-off value of 7 was 44%.
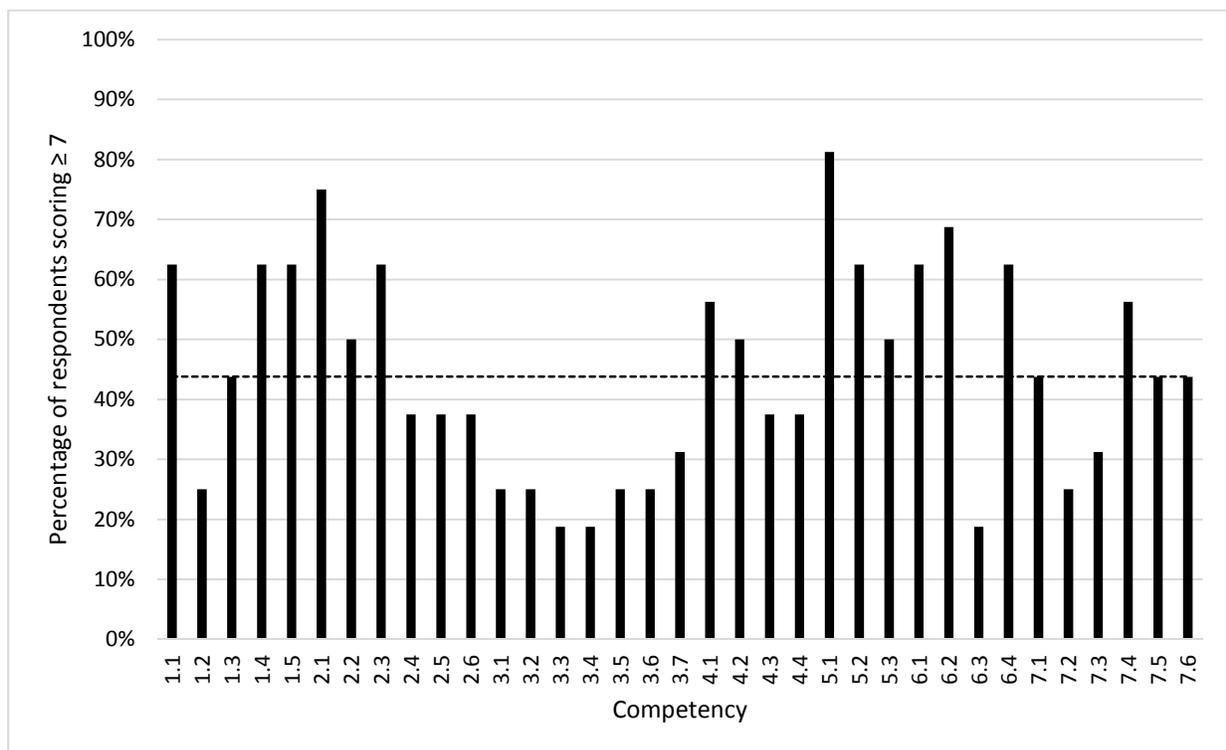
Figure 1. Percentage of respondents who scored their proficiency as greater than or equal to 7 out of 10 across the Core Competencies before collaboratively developing a business plan. The horizontal line represents the median percentage of respondents who scored their proficiency at or above 7 out of 10.

After the assignment, using the same cut-off value of 7 out of 10, competency 1.4 – "*Use evidence and research to inform health policies and programs*" – had the greatest percentage of respondents at or above the cut-off (91%) (see Figure 2). Conversely, competency 1.2 – "*Demonstrate knowledge about the history, structure and interaction of public health and health care services at local, provincial/territorial, national, and international levels*" – had the lowest

percentage of respondents at or above the cut-off (45%). The median percentage of respondents at or above the cut-off value of 7 was 73%.
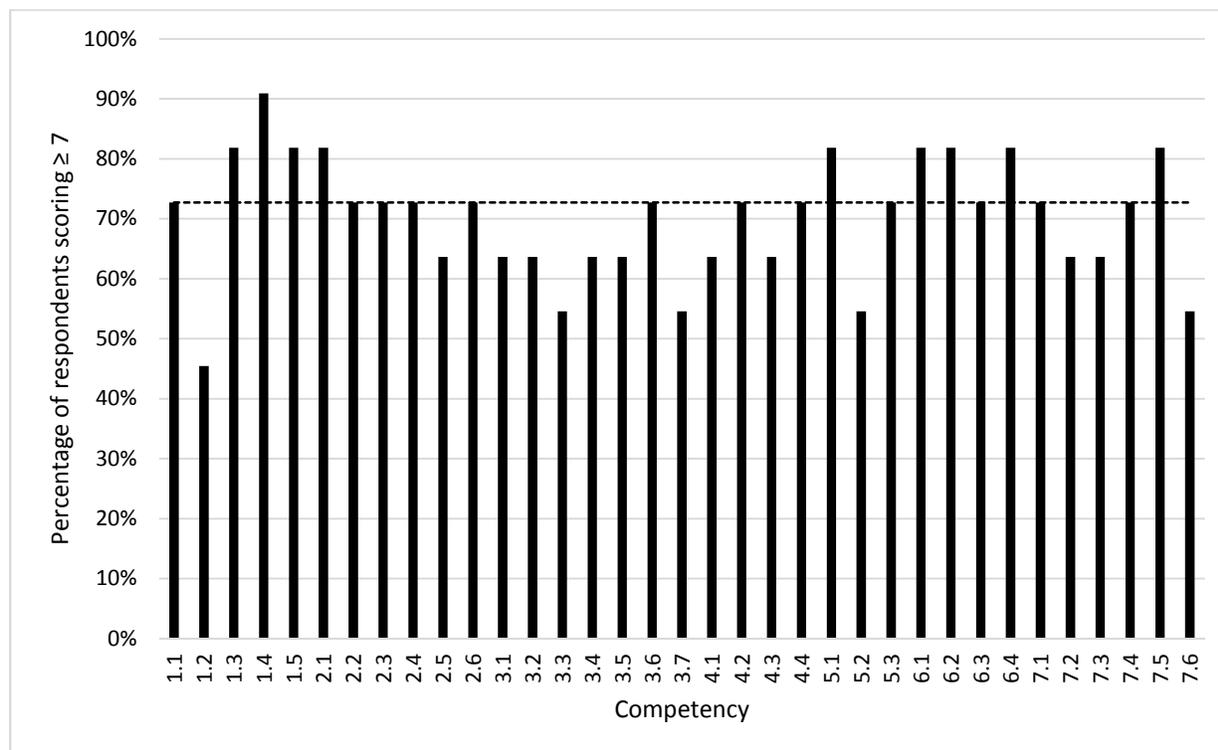

Figure 2. Percentage of respondents who scored their proficiency as greater than or equal to 7 out of 10 across the Core Competencies after collaboratively developing a business plan. The horizontal line represents the median percentage of respondents who scored their proficiency at or above 7 out of 10.

Comparing the difference between the percentage of respondents at or above the cut-off value of 7 out of 10 before and after the assignment, competency 6.3 – "*Mobilize individuals and communities by using appropriate media, community resources and social marketing techniques*" – had the greatest absolute difference (54%; Pre = 19%, Post = 73%) in the percentage of respondents at or above the cut-off value (see Figure 3). Competency 5.2 – "*Address population diversity when planning, implementing, adapting and evaluating public health programs and policies*" – had the lowest absolute difference (-8%; Pre = 63%, Post = 55%). The median absolute difference was 26%. Of note, a majority of the competencies in category 3 – Policy and Program Planning, Implementation and Evaluation (6/7) – and 7 – Leadership (4/6) – were above the median. Half of the competencies in category 2 – Assessment and Analysis (3/6) – and 4 – Partnerships, Collaboration and Advocacy (2/4) – were at or above the median.
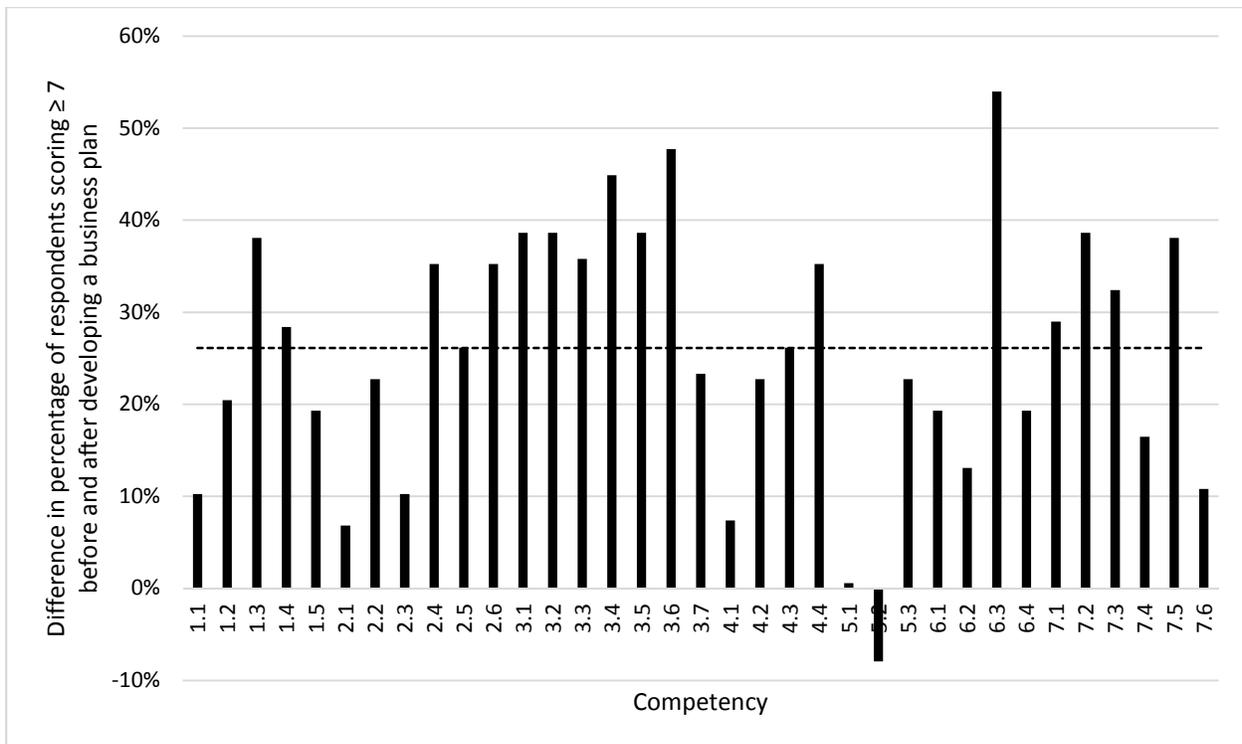
Figure 3. Difference in the percentage of respondents who scored their proficiency as greater than or equal to 7 out of 10 before and after developing a business plan. The horizontal line represents the median difference.

When project leaders assessed their group's proficiency in the Core Competencies after the assignment, 29 out of 35 competencies were scored by all respondents at a proficiency level of 7 or greater. The six competencies where at least one respondent scored their group's proficiency as less than 7 were 2.4 – "*Analyze information to determine appropriate implications, uses, gaps and limitations,*" 3.2 – "*Describe the implications of each* [policy] *option, especially as they apply to the determinants of health and recommend or decide on a course of action,*" 3.5 – "*Demonstrate the ability to implement effective practice guidelines,*" 6.1 – "*Communicate effectively with individuals, families, groups, communities, and colleagues,*" 7.4 – "*Contribute to team and organizational learning in order to advance public health goals,*" and 7.5 – "*Contribute to maintaining organizational performance standards*".

Frequency of Collaboration

The majority of project leaders (60%) indicated that they spent 1-2 hours per week, on average, directly working with their group with 20% spending less than one hour and 20% spending 3-4 hours per week. Student respondents indicated that they spent less than one hour (45%), and 1-2 hours per week (55%), on average, directly working with their project leader.

Perceived Value of the Assignment and External Collaboration

The majority of student respondents either strongly agreed or agreed that creating a business plan enhanced their integration into the public health sector (82%), job readiness upon

graduation (91%), graduate studies experience (91%), and was effective in achieving the course learning outcomes (91%). All project leaders strongly agreed that creating a business plan enhances student integration into the public health sector and job readiness upon graduation. They also either strongly agreed or agreed that creating a business plan is important to enhancing student proficiency in the Core Competencies.

All student respondents either strongly agreed or agreed that collaborating with a public health organization enhanced their job readiness and graduate studies, and was effective in achieving learning outcomes. The majority of respondents (91%) also strongly agreed or agreed that it enhanced their integration into the public health sector upon graduation. All project leaders strongly agreed that collaboration enhances student integration into the public health sector and their job readiness, and is important to enhancing their proficiency in the Core Competencies.

Qualitative Themes

Focus group participants felt that they most improved in categories 3 – Policy and Program Planning, Implementation and Evaluation (43%), 6 – Communication (29%), 2 – Assessment and Analysis (14%), and 4 – Partnerships, Collaboration and Advocacy (14%). Except for Communication, all other competency categories were identified by at least one participant as having least improved in this category through completing the assignment.

Two major themes were identified: (a) expanded and unique learning opportunities; and (b) managing and communicating expectations.

Expanded and unique learning opportunities refers to the variation in participants' learning experiences both within and between groups. Creating a business plan allowed participants to apply their knowledge gained in previous graduate courses, and to learn new knowledge that they could apply to future courses and job interviews. Given the size and complexity of the assignment, participants indicated that they divided up the work between group members. However, this division of labour made each student's learning experience unique to them. As one participant commented,

> …there were so many areas that I wasn't involved with like it might have been a good learning…experience to learn how to do those things. And like I know that these things are supposed to be in a business plan but…I don't actually know how to do them.

Learning opportunities were expanded through collaboration which offered a more realistic experience. Participants had to newly consider feasibility and the public health organization's requirements when creating their business plan. As one participant stated, "…if you had an idea that was really ridiculous that you would have maybe put in a project in first year. It would just be you know rejected and 'No you can't do that'." Another stated,

> It was almost like there were two sets of like projects…There was the project for the health unit and what they wanted to see at the end of it and the project for like our final paper and what was required for the course…

Collaboration also provided students with access to information that would otherwise have been unavailable to them.

Managing and communicating expectations was discussed in relation to the project deliverables, and their future implementation. Participants identified differences between the desired outcomes for the assignment and the public health organization. As one participant stated, "…they had specific things that they needed out of the project which were not necessarily the same as the deliverables we needed for the course…" Several participants expressed that better alignment was needed. Participants also suggested that more in-depth project descriptions with clear outcomes, budget, and timelines would have improved the assignment. Participants also expressed a sense of ownership over their work, and a desire to see it implemented by the public health organization. One participant expressed "It would be nice to know if they used anything especially since the effort that most of us put into it." In discussing a theoretical versus collaborative assignment, one participant stated,

> …it's nice to have a real project even if they don't implement it. It would be nice to think that they would or that the work that you're doing is helpful and meaningful which I think like gives me a great deal of satisfaction knowing that it's like relevant um so a theoretical assignment probably just wouldn't have wouldn't have given me the same level of satisfaction.

This sense of ownership created another set of expectations outside of the assignment relating to how their work would be used in the future.

Discussion

The objective of this study was to assess the impact of a new collaborative capstone experience on MPH students' perceived proficiency in the Core Competencies using a pre-/post-assignment survey and focus groups. By collecting both quantitative data from students and project leaders, and qualitative data from students, we were able to meaningfully triangulate the data in order to gain a richer perspective of students' collaborative learning experiences.

These data indicate that, overall, student respondents increased their proficiency across the Core Competencies with notable gains in several competency categories including Policy and Program Planning, Implementation and Evaluation, Leadership, Communication, Assessment and Analysis, and Partnerships, Collaboration and Advocacy. Previous work by Papadopoulos et al. (2013) mapped all of the Core Competencies onto the creation of a business plan. These gains across different competency categories may also be attributed to the variety of public health issues addressed, and different roles/responsibilities that students undertook in their small groups in order to develop their business plan in a relatively short period of time. Of note, there was an apparent decrease in the level of proficiency in competency 5.2 – "*Address population diversity when planning, implementing, adapting and evaluating public health programs and policies.*" Although it is not possible to determine if this was a significant decrease or simply "noise" in the data, it is possible that the selected project topics did not foster learning related to diversity and inclusiveness and represents a missed learning opportunity to be addressed in future iterations of this assignment.

Collaborating with a local public health organization to address an identified need is an example of a high impact educational practice known as service learning (Kuh, 2008). According to the Association of Schools of Public Health Council of Public Health Practice Coordinators, service learning is

a structured learning experience that combines community service with preparation and reflection. Students engaged in service learning provide community service in response to community-identified concerns and learn about the context in which service is provided, the connection between their service and academic coursework, and their roles as citizens. (Atchison, Boatright, Merrigan, Quill, & Whittaker, 2004, p. 9)

In this study, the service learning experience was important for integration into the public health sector, enhancing job readiness and graduate studies, achieving the course learning outcomes, and increasing proficiency in the Core Competencies. It also allowed some students to better understand their particular interests in public health, and feel a sense of satisfaction with their work. Managing and communicating expectations was important throughout the service learning experience. Students, project leaders and the local public health organization, the course teaching assistant, and the course instructor all had expectations regarding successful completion of this assignment. Ensuring that these expectations are aligned and communicated was an important lesson learned from this experience. Service learning has been conducted in other MPH programs. For example, Gregorio, DeChello, & Segal (2008) evaluated three MPH service learning experiences at the University of Connecticut and found that 68% of students derived high or very high educational value from the experience. Hou (2009) from the University of Georgia described her experience with service learning in a first-year MPH course and found that students derived benefits from engaging with community members, working as a team in a realistic setting, and applying their knowledge in a concrete manner. Challenges included having to immediately apply new classroom knowledge, intensive project requirements, and short timelines. Similar benefits and challenges were noted by student respondents in our study. Overall, service learning provides students with a concentrated, rewarding experience where they can apply their knowledge to address a current issue while contributing their time and skills to the community.

In this study, students self-assessed their proficiency using statements from the Core Competencies. Previous work by Britten, Wallar, McEwen, & Papadopoulos, 2014 used the Core Competencies to facilitate students' self-assessment of their proficiency before and after the University of Guelph MPH program. Both quantitative and qualitative results highlighted students' unique learning experiences such that their proficiency was enhanced in different competencies depending on their role(s) in the project. Depending on the student's level of proficiency in the Core Competencies, this can be viewed as either a positive or negative outcome. Having some independence to tailor the learning experience can be a positive outcome for those students who were able to enhance their proficiency in desired competencies. However, it can be a negative outcome for those students who were unable to enhance their proficiency in desired competencies. It is important to consider how group assignments will be experienced by students, and monitor this experience to ensure there are opportunities for students to enhance their proficiency in needed areas. Group dynamics may be another influential factor in this regard. In this assignment, students organized themselves into groups of 4-5 students rather than being organized by the instructor, AP. Given students' similar public health education levels, the need to balance groups by assigning group membership was not deemed to be important. The number of students per group was decided based on AP's assessment of the work needed to complete the assignment. All groups worked well together, and produced high-quality business

plans. The impact of group selection on the development of proficiency in the Core Competencies is a potential area of future research.

One limitation of using the Core Competencies for student assessment is that these competency statements were written for public health professionals rather than graduate students. This may limit the validity of using these professional-level statements to assess student performance. This distinction is important to make, and separate MPH competency statements have been developed in the United States (Calhoun et al., 2008), Australia (Genat & Robinson, 2010), and Europe (Birt & Foldspang, 2011). There is an immediate need for the development of MPH competency statements that reflect the unique public health landscape in Canada. If Canadian schools and programs in public health are to provide a competency-based learning environment, it is important that graduate competencies are clear, consistent, and communicated. It is also important that these competencies inform MPH program and course learning objectives, and are aligned with workforce needs. We encourage the Public Health Agency of Canada and other public health education stakeholders, including administrators of Schools of Public Health and Master of Public Health programs, to initiate the development of these statements.

Other study limitations included: small sample size; inability to individually match pre-/post- survey results due to a software glitch and by extension, calculate measures of significance; potential for positive scale bias by anchoring "good" in the middle of the Likert scale; lack of survey construct validation (e.g. pilot testing); qualitative analysis solely conducted by LEW; inability to correlate perceived proficiency and course marks given the anonymous nature of the data; and inability to separate the potential effects of other learning experiences on students' perceived proficiency in the Core Competencies. These results are reflective of the experiences of University of Guelph MPH student respondents. Despite these limitations, comparable collaborative learning experiences in other graduate public health programs may offer similar benefits. It is also important to note that these results reflect perceived rather than objectively measured proficiency in the Core Competencies. However, the high quality of the submitted business plans corroborate the higher levels of students' perceived proficiency across the Core Competencies. Future work will evaluate the teaching and assessment methods that are used to enhance and measure student proficiency in this course using the Core Competencies as an evaluative framework.

This study aimed to quantitatively and qualitatively assess students' capstone experiences in collaborating with a local public health organization to develop a business plan that addressed a relevant issue. To our knowledge, this is the first study to use the Core Competencies to assess the impact of a collaborative learning experience on student proficiency. Future directions include refining and expanding this method to other assignments and learning experiences.

Conclusions

Here, we have described the impact of a collaborative capstone assignment on student proficiency in the Core Competencies, and further explored their learning experience using qualitative methods, providing a richer understanding of our students' perspectives. Although the Core Competencies are intended for public health professionals rather than graduate students, students perceived themselves as proficient across the Core Competencies after completing the assignment. This collaborative assignment further provided expanded and unique learning opportunities, and management and communication of expectations was important throughout the experience. By using realistic community-based assignments, graduate public health

programs can enrich students' learning experiences by creating an environment for students to apply their classroom knowledge, and gain practical knowledge and skills. Professional-developed and endorsed competency statements provide a standardized set of expectations that can be used by students to assess their proficiency, and reflect upon their learning and development. As they continue to be developed and refined, it is important to give due consideration to their validity as a measurement tool of student progress and proficiency. General lessons learned from this experience include: (a) Have clear assignment expectations that are communicated to the students, teaching assistant(s), and external partners. These expectations should be developed in partnership with the external partners, and discussed prior to the start of the assignment; (b) Maintain regular two-way communication of these expectations between the students, teaching assistant(s), course instructor(s), and external partners. By being intentional about regular communication, students' learning experiences can be monitored, and if needed, modified to enhance their experiences; and (c) Make room for flexibility and innovation. Service learning in collaboration with external partners is an excellent opportunity for students to explore their interests, and gain additional knowledge and skills. By giving students some independence to tailor their learning experience, it can improve the quality of their work, and their satisfaction with the collaborative experience.

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Appendix 1
Course Learning Outcomes

The course learning outcomes for Public Health Administration are:

1. Define and explain a public health organization's mission and priorities.
2. Translate the mission of the organization within personal or unit scope of work.
3. Define and explain cost-effectiveness, cost-benefit, and cost-utility analysis.
4. Define and translate the budget process in public health.
5. Define and translate strategies for determining budget priorities.
6. Identify internal and external issues that may impact delivery of essential public health services (e.g., strategic planning).
7. Contribute to development, implementation, and monitoring of organizational performance standards.
8. Explain the process of and be able to conduct a program evaluation.
9. Understand the role of external partners and be able to work with community stakeholders and other agencies.
10. Understand occupational health and safety issues and how they relate to effective management.

Appendix 2
Final Assignment - Public Health Administration

Public Health Business Plan

The assignment can be discussed with your classmates but the business plan must be the original work of your group. Use referencing where appropriate.

You will have the opportunity to choose from a list of public health programs with the host public health organization. You will work with a designated representative on a program that must be developed. The host public health organization will be anticipating taking your proposal and implementing it in the near future.

You will be required to submit a written business plan (80% of grade) and deliver a 20 minute presentation (20% of grade) to staff of the host public health organization, faculty members, and invited guests. The presentation will provide an overview of the program and will describe the reasons for the direction of your program. The presentation will cover all components of the program. Not all group members are required to deliver the presentation.

You can be given a template to follow when submitting your business plan. This will be a table of contents that you will be required to fill in. You may wish to add more information through the use of headings and sub-headings. Feel free to amend the style of the document.

You will not be required to provide extensive financial statements and calculations. You will however, be required to provide a one year budget, using estimates where appropriate.

The length of the assignment will be up to you. Please provide enough information to allow your target audience to make a decision on the expansion or improvement proposed by your business plan. Include any additional information you feel is relevant as an appendix to the main body of your business plan.

You may find the following websites helpful and useful:

Public Health Business Planning - http://www.publichealthbusinessplanning.org/

Management Academy for Public Health –
http://www.maph.unc.edu/bplans/bplan_models/index.htm

The Online Public Health Program Planner –
http://www.thcu.ca/ohpp/2009_04_06_email_en.html