Challenge of engagement inside and outside the classroom: the future for universities

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Introduction

The traditional model of higher education is failing students and society. In many jurisdictions, there is a tendency to mass education with greater participation and greater demands for university education, but less money available to support high-quality education. The fundamental challenge is to develop an approach to education that empowers students to take control of their learning, to be engaged in the process of research and learning and to encourage them to develop the skills so that they can selectively process and transform information into knowledge and eventually wisdom.

The University of Guelph has taken this challenge seriously and tried to engage students inside and outside the classroom to take more responsibility for their learning processes and for the world around them. On the basis that engagement is a key driver of university success [1], the university deliberately fosters three distinct approaches to engage students with the purpose of enhancing retention and improving academic performance. First, the university fosters community engagement and citizenship through active programmes for newly arrived first-year students in residence at the start of their university career. Through a peer-mentoring scheme, new students are encouraged to experience opportunities to volunteer in the local community. There is a website available to promote volunteer opportunities and encourage participation. Secondly, the university offers a variety of courses and extracurricular activities to foster service learning and contributions to community volunteerism. Thirdly, the university introduced a first-year seminar programme where incoming students from all disciplines were offered the opportunities to register for an interdisciplinary course taught in a small-group format. Some of these seminars were taught in an enquiry-based mode and this afforded the opportunity to study the effects of this approach to learning, compared with other small-group teaching methodologies, and to see whether or not there was any relationship between deeper academic engagement in the enquiry-based course and volunteerism.

The University of Guelph has a reputation as the ‘most caring University in the world’, more than 70% of undergraduate students volunteer more than five hours a week and there is a very strong ethos for academic and administrative staff to be engaged in volunteer activities within and outside the university. The

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student body holds a series of national records for various charitable activities and the university, as a whole, raises one of the largest amount of money per year for United Way (a coalition of charitable organizations of North America).

**Changing face of education**

Universities, like most public institutions worldwide, are facing significant financial pressures [2]. There is also an increased demand for access to university places. This places pressure on the traditional Socratic methods of teaching and learning as student-to-faculty ratios and class sizes increase. Universities are also facing a generation of students who have access to the internet (including in many circumstances in-class access); information that was once held within the bastion of universities is increasingly democratized and ubiquitously available [2,3].

In many cases, universities have not fundamentally changed their pedagogical techniques: they still tend to focus teaching on lecture and laboratory sessions and teach material largely within disciplinary boundaries, leaving the sense of integration to the mind of the learner once a certain body of knowledge has been accumulated.

There are pressures from the business world too: there is an increasing sense that there should be an emphasis on problem-solving, group work, collaboration and integrated approaches to problems. Although many universities have attempted to introduce problem-solving and now use group work, most of the evaluation strategies are individualized and there is little rigorous attempt to introduce effective evaluation strategies for integrated collaborative learning [2,3].

**Changing faces of students**

There are significant shifts in student demographics in universities. Over the past twenty years, in many institutions worldwide, there has been a major switch in gender balance from predominantly male to predominantly female [2], and in many jurisdictions migration and immigration has changed the ethnic and socio-cultural make-up of the student population (see other Chapters in this publication). At the same time, the learning styles of so-called millennial students are recognized to be completely different from those of previous generations and their attitudes to learning are also different [4].

Again, in many universities, there has been no change in the approaches to teaching and learning to accommodate the students nor have universities recognized the extent of the available research that could be applied to improve students’ educational experiences [2,3].

**Strategies to engage students in volunteerism**

Through the residence system, where more than 90% of incoming students are in residence, the University of Guelph maintains a process through peer-mentoring
and support to engage new students in volunteer activities in the first few weeks of the fall semester. Students are introduced to volunteer experiences in the city and encouraged to reflect on those experiences. They are also provided with a website to locate volunteer activities in the city and elsewhere and given seminars and informal extracurricular sessions on volunteer opportunities in further vacations and breaks in the learning cycle.

**Academic engagement through service learning**

The university has a strong commitment to service learning: providing opportunities for students to identify community-based projects and activities in which they can engage and receive academic credit. The process of participation includes prior assessment and learning about the particular context, identification and work on specific learning objectives, including community-based learning and reflective time, and strategies to evaluate the impact of the experience, including sharing the experience with other students and community members.

**Academic and social engagement through enquiry-based learning**

Murray and Summerlee [5] reported that introducing PBL (problem-based learning) in a first-year seminar course at the University of Guelph significantly improved the learning behaviours of students, excited in them greater motivation to succeed and led to enhanced reasoning and processing skills. They showed that these skills were both transferable and persistent throughout the students’ undergraduate experience. These changes, however, were self-reported observations by students and based on qualitative observation.

More recently, Summerlee and Murray [6] provided quantitative evidence for the persistent effects of PBL, when offered as an elective in the first year of university. The progress of students, who participated in the problem-based seminar courses, was followed through the remainder of their academic programme to determine if their own beliefs about the increase in their performance were substantiated by measurable changes in their academic performance as revealed by grades in other (more traditionally taught) courses. In the same study, the authors explored the students’ approach to the learning resources that they used during the seminars to determine whether changes in their academic performance were related to, or could be attributed to, differences in their skills at scholarly research, in particular by accessing more appropriate resources [6].

Research points to a reciprocal relationship between engagement in the classroom and effective learning [1], and between active learning and engagement in the university or wider community [7]. There are also data to suggest that students in small classes show a greater level of community engagement [8]. Therefore the study also explored whether students who became engaged in learning through a problem-based course might also show a greater level of community engagement [6].
Definition of the enquiry-based experience

A suite of interdisciplinary seminars was developed using a specific approach to teaching and learning known as closed-loop reiterative PBL [5,9,10]. In the scholarly literature, there is considerable subjective discussion, but very little objective assessment, of the pedagogical approach that is referred to as PBL. Close examination of the various approaches labelled as PBL reveals that the term is loosely applied to such diverse classroom approaches as those that use problems to illustrate principles or ideas, to those that use problems to stimulate learning. Despite a number of specific publications focused on this approach, there remains a remarkably low level of acceptance of the fact that closed-loop reiterative PBL is quite a different pedagogy from the simple use of problems in large classes to demonstrate or reinforce the principles conveyed in a traditional lecture format. Part of the challenge may come from the confusion created by the use of the word ‘problem’ in the phrase problem-based learning, because it seems to emphasize the centrality of the ‘problem’. It implies that there is a problem for which students must find the answer when the situation is quite the contrary. Closed-loop reiterative PBL uses a ‘problem’ or a ‘situation’ to incite students to question context, to find information that supports understanding the principles that lie behind the ‘problem’, and to reflect upon the wider implications. Quite literally, the scenario is used to pique students’ interest and motivate them to enquire about the many issues that underlie the problem, which is perhaps better termed scenario.

EBL (enquiry-based learning) more accurately describes the approach used and better reflects the emphasis of the pedagogy. EBL shifts the focus to enquiry and away from solving problems. However, even this may not provide sufficient clarity and there is some difference of opinion in the literature about this term too. It is therefore important to be precise about the nature of the educational experience in the research used at the University of Guelph.

In closed-loop reiterative EBL, students are presented with a scenario that requires them to identify issues, research the principles underlying the issues and learn in context (for full details of the approach, see [5]). It is not necessary for the students to ‘solve’ the problems; in fact, many of the scenarios are deliberately designed so they do not have a ready solution. The scenarios are intended to motivate the students to be engaged in learning and understanding the issues that underlie the scenario. The reiterative nature of the process encourages students to practise effective communication, to learn how to criticize and how to behave in academic situations, in addition to learning and assimilating content. The students are encouraged to focus on finding appropriate resources that lead to understanding and they share information and resources with each other.

At the end of every class meeting, time is devoted to group processing. This is an absolutely crucial part of the learning process and is often avoided by other pedagogical approaches that have adopted the label of ‘PBL’. In group processing, each member of the group provides concise and precise feedback to every other member of the group, as well as engaging in self-assessment of their own performance. This provides the opportunity for the students and the facilitators to enhance communication, critical thinking and research skills. One-third of every class period is spent in group processing.
Impacts of engagement

Three different approaches to engagement were followed and the impact of each measured in different ways:

- Engagement in community volunteerism and the impact on retention and personal awareness and satisfaction
- Academic and community engagement through service learning and the effect on the level of motivation expressed by students towards their programmes of study
- Quantitative and qualitative impacts of engagement on academic achievement, community volunteerism and international experiences

Impacts of community engagement

Entering first-year students are encouraged to participate in a weekend volunteer experience in help agencies in the city of Guelph. They receive pre-activity training, mentoring by peers and are provided with an opportunity to reflect on it. Students report that these experiences are highly motivating and result in a significant degree of further involvement in volunteer activities. The majority of students participating in the scheme report that the experience makes a positive impact on a sense of belonging to a community and belonging to a community of scholars who share an interest in promoting community engagement and citizenship. Approximately 25% of the participants report that they appreciate that there is a connection between being involved in this exercise and academic achievement, but more than 80% indicated that the experience transforms their impression of the value of volunteerism. The majority of students report that the exercise increases their level of self-awareness and self-confidence.

University retention (defined as continuation from year one to year two of study at university) varies from 90 to 95% and there is a correlation ($r = 0.67$) between the level of reported volunteerism among first-year students and retention.

Impacts of service learning

The impacts of service learning have been assessed qualitatively through student surveys and self-assessment of the impact on learning and motivation. Students report that service learning is highly motivational, strongly reinforces the concepts of community engagement, fosters cohesiveness among members of the class, and promotes deep and persistent learning.

Impacts of EBL on achievement and volunteerism

The performance of students who had participated in the first-year enquiry-based seminar course was assessed and compared with the performance of students who had experienced a traditional first-year approach and students who had participated in a small-group seminar that was not delivered in an enquiry-based format. The entering admission grades, course of study and gender of the individuals in
the groups were matched for the three groups. Performance was assessed in two ways: qualitative assessment through surveys delivered at the end of each year and quantitative assessment of the academic marks achieved in all subsequent courses.

In the self-assessment surveys completed by students, individuals in the EBL seminars reported that they not only learned content more effectively but that they learned superior processing and reasoning skills. They made a connection with their ability to find appropriate resources with an enhanced learning experience, which they observed extended to other courses. They indicated that they learned how to function more effectively in group-settings and this gave them the confidence to believe that they were more effective and responsible learners [5].

For the quantitative assessment of achievement, the performance of students in an EBL group was compared with the two control groups over their entire undergraduate course. As an illustration, Figure 1 shows the impact of one first-year course using EBL. Consistently, after completing an EBL seminar class in the second semester of an undergraduate course, students in the EBL seminar class outperformed students in control groups. On average (across all the EBL groups studied), the academic grades of the EBL students by graduation are approximately 9% higher than their peers (range 2.5–11.2%). This superior level of performance is statistically significant [6].

There was an inverse relationship between the increase in improvement of the students in the EBL courses compared with their academic performance (admission average) on entering the university. The academic performance of a

![Figure 1](image)

**Figure 1**

**Average grade in all courses completed**

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**Impact of one first-year course using EBL**

The average grades during the remainder of the course of study compared between groups of students undergoing EBL and other teaching. The results are means±S.E.M. for each group. *P≤0.05.
cohort of students who had taken an EBL course was evaluated at the end of their third year of university (after completing semester six). The students were divided into four groups (stratum 1–4), according to their grades, upon admission to the university. Their overall academic average for all courses completed by the end of semester six is shown in Figure 2.

The average grades for students in all four strata improved, as would be anticipated based on the data reported in Figure 1, but the improvement in performance is greatest for those students with the lowest grades upon entry to university, and vice versa for those students with the highest grades upon entry to university [6].

Students in the EBL seminars reported that they develop effective independent research capability, learn to use the library efficiently and have an increased level of self-confidence. They rely less on family, friends, professors and teachers for resources and preferentially seek library and sophisticated databases, and original papers rather than simple internet-based materials and search processes (e.g. Wikipedia). Moreover, they reported a significant increase in the frequency with which they consulted reference librarians to help to identify appropriate sources. This demonstrated level of sophistication remained throughout the students’ undergraduate experiences.

Finally, students reported on their level of engagement through volunteerism by completing a survey before starting their small-group experience in the second semester and at the end of their second year of study. On average, when compared with the control group, students who participated in the EBL seminar course reported an increase in the time they spent volunteering in the community (outside the university), an increase in the time they spent volunteering inside the university (in clubs, societies and in governance processes) and a higher proportion were engaged in international experiences during the summer vacation between their first and second years of study [6].
Discussion

To address the challenges facing higher education and the need to empower students more fully in the process of learning, the University of Guelph has taken seriously the concept that there is a reciprocal relationship between social and academic engagement, and retention and performance in university. This has been practised in three ways: to engage students in volunteer activities; to provide academic learning opportunities that include service learning; and to deliberately introduce a first-year seminar experience in which students were exposed to EBL. The mode of delivery of the EBL experience was deliberately constructed to ensure students learned process and content through a closed-loop reiterative enquiry-based mode [5,9].

The impacts of these actions have been to promote a very high level of retention, a significant level of student satisfaction with the atmosphere on campus and to motivate students (particularly those in the EBL seminars) to have confidence in their abilities and show superior academic performance in subsequent (more traditional) academic courses. Moreover, there is a distinct shift in the learning processes that the students adopt: they become effective at independent research that drives the change in their academic performance. In a time when there is an increasing trend towards mass education at the university level, these approaches create the opportunities for students to take responsibility for their own learning and improve the quality of the educational experience.

At one level, it might be argued that the higher rate of academic achievement in the small-group seminars, in service learning and in the fostered volunteer activities could be explained by the fact that all these exercises develop learning communities. Alexander Meiklejohn [11] first introduced this concept in his short-lived experimental college in Wisconsin in the 1920s. He argued that students engaged in learning together, effectively a learning community, showed superior academic performance compared with students learning alone. The concept re-emerged in the late 1980s, supported by the growing recognition that student engagement in educationally purposeful activities, inside and outside the classroom, is a precursor to higher levels of achievement and higher levels or retention [1,12,13]. Lenning and Ebbers [14] recognized four generic learning communities:

- Curricular communities (students co-enrolled in two or more courses linked by a common theme)
- Classroom learning communities (group process learning in a classroom setting)
- Residential learning communities (students in residence clusters taking two or more classes together)
- Student-type learning communities (targeted groups of similar academic achievement and/or under-represented groups)

Students in the first-year seminars, the service learning opportunities and possibly the staged volunteer activities would certainly fit within the concept of a learning community.
However, whereas the shared academic experience in the class and in the community may be part of the basis for the immediate success of the students, learning and working together is not an adequate explanation for their persistent enhanced success, particularly that observed for the students in the seminars. In subsequent semesters, students from the EBL group consistently performed better than their peers in the control groups, including a control group of students who selected different small-group seminars but were not taught in an enquiry-based mode. Moreover, the EBL group showed higher performance for the remainder of their undergraduate experience (Figure 1), something students in the non-EBL small group did not do.

Theoretically, learning communities are intentionally structured to help students make two types of links. The first is to encourage them to connect ideas from different disciplines; the second is to forge enduring social connections within the group, to allow them to develop their own identity and voice within the group. These tenets are inherent in the volunteer activities but are not formally structured. In contrast, they are fundamental underpinnings of closed-loop reiterative EBL and are practised and reinforced throughout the EBL courses. The critical question is, whether this structure alone is sufficient to explain the persistence of the superior academic performance by the EBL groups. As mentioned above, there is evidence that the students change their pattern of access to resources [6]. As this shift in the pattern of accessing learning resources is persistent throughout the remainder of their university education [6], it is possible that the higher academic performance in the EBL groups is related to a combination of factors including: being part of a tight-knit learning community; being more motivated to find out and learn; and having developed the research skills and the understanding of the importance of research to be able to find information to support their learning. Finally, students reported increased confidence in their own abilities [5]. They recognize the limits of their knowledge and have the ability to find information efficiently compared with non-EBL students. These may also be important factors in driving more effective learning.

In a meta-analysis of engagement by students, where varying levels of PBL methodology were used, Ahlfeldt, Mehta and Sellnow [8] demonstrated that engagement increases in three circumstances:

- As course level increases
- As class size decreases
- As the component of PBL increases

Their analysis was based on responses to questions in the NSSE (National Survey of Student Engagement) in the United States and Canada by students from a number of institutions practising various forms of PBL and demonstrated statistically significant improvement in engagement among students involved in small-group active learning. The inference is that greater engagement will lead to higher academic performance and greater satisfaction with the educational experience. Their data, however, suggest that PBL classes are more effective at upper levels of undergraduate study. The implication is that upper year students are more likely to have the skills to be able to take advantage of PBL.
The data presented by Summerlee and Murray [6] suggest otherwise: engaging students in their first year appears to create the circumstances for improved ability to learn, encourages students to be more involved with the community and changes the pattern of access to learning resources. All of these appear to combine to provide better retention, better satisfaction and better academic performance; and these observations are both qualitative [5,8] and quantitative [6]. Additionally, and perhaps more persuasively for faculty who are concerned about the apparent lack of sequence and structure in enquiry- or problem-based learning, the data demonstrate that students also develop conventional intellectual rigour.

The literature concerning engagement and academic performance is compelling [1,8,15]. The work based on engagement relies on information gathered by the NSSE, which asks students to respond to questions such as: how often have you been asked questions in class; worked with other students; worked with classmates outside class; tutored other students? These sorts of questions address the fundamentals of EBL, so it would be reasonable to expect that the meta-analysis of performance of EBL/PBL students would reveal greater levels of engagement. At the same time, the students are also asked questions about analysing, synthesizing and organizing data and applying information. Again, the latter are absolutely critical elements of PBL/EBL [5,6,9] so it would be anticipated that under these criteria for student engagement, students in PBL/EBL classes would score highly.

At the University of Guelph, a broader definition of engagement is used which more closely resembles the definitions used in the business literature on empowerment. There is direct comparison with empowerment studies where empowerment is viewed as a motivational construct [16], where individuals are enabled rather than simply delegated authority [17–19]. The expanded definition of engagement includes:

- Participation in volunteer activity in the community
- Participation in an international experience
- Participation in a service-learning credit course
- Participation in active learning strategies in class (including the EBL first-year seminars)

Despite the already high level of volunteer activity compared with university students across Canada (the participation rate is 70%, whereas the Canadian average for volunteer activity is 40% [2]), students who participated in the EBL seminars showed an even higher level of participation in community and international activity compared with matched peers [6]. This suggests that there is a reciprocal relationship between learning and community engagement.

In conclusion, the experiences at the University of Guelph suggest that intentional focus on engagement inside and outside the classroom has a positive effect on the learning outcomes of university students. Introducing experiences that foster these types of engagement early in the educational experience of the students fosters a deeper commitment to learning and develops the skills necessary for superior academic performance. The results of the university’s experiments raise intriguing questions about how to redesign the first-year experience for university students to create a more engaged cohort of learners. In the light of
the plea to return to broader university education from a number of sectors to avoid the economic mistakes seen on the world market [20], perhaps we need to re-evaluate what we are doing in universities worldwide.

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The author would like to thank the students for their energy, enthusiasm and constant drive to make the University of Guelph do more and do better. The ethos of engagement by students is infectious and self-perpetuating.

References