The Development of a New Innovative Online Undergraduate Health Sciences Program: A Case Study

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Abstract

In September 2016, Queen's University launched the first, fully online, 4-year Bachelor of Health Science degree program in Canada. This paper reports on the developmental structure, implementation philosophy, and challenges in the development of this competency-based program. All stakeholders directly involved in program development were invited to participate in this qualitative case study. Thirty-five interviews and three focus groups (*n*=14) were conducted. Interviews and focus groups were transcribed verbatim and data were analyzed using thematic design. Themes included: program vision; desired program outcomes; administrative processes for funding and recruitment; uniqueness of the program; local, regional and international impact of the program; communication and collaborations for program development; and uncertainty in long term outcomes. Findings suggest that during program development, an explicit vision of program goals encouraged buy-in at most levels of the university. There was consensus that the overarching outcome should be to provide a rigorous, high quality program with pathways to professional, basic science, global health and advocacy-based health professions. The online modality was expected to improve accessibility to degree programs, as well as address diverse student learning needs. Innovation played a vital role in the program's development and was founded in educational theory and curriculum development practices.

En septembre 2016, l'Université Queen's a lancé le premier programme de 4 ans menant à un diplôme, le baccalauréat en sciences de la santé, entièrement en ligne. Cet article présente un rapport sur la structure du développement, la philosophie de mise en oeuvre et les défis qui se sont présentés lors du développement de ce programme basé sur la compétence. Toutes les parties prenantes qui avaient été directement impliquées dans le développement de ce programme ont été invitées à participer à cette étude de cas qualitative. Trente-cinq entrevues ont été menées et trois groupes de discussion (*n*=14) ont été organisés. Ce qui a été dit pendant les entrevues et les groupes de discussion a été transcrit verbatim et les données ont été analysées en utilisant la conception thématique. Les thèmes étaient les suivants : vision du programme, résultats désirés du programme, processus administratifs pour le financement et le recrutement, aspect unique du programme, impacts local, régional et international du programme, communications et collaborations pour le développement du programme, incertitudes concernant les résultats à long terme. Les résultats suggèrent qu'au cours de la phase de développement du programme, une vision explicite des objectifs du programme avait encouragé l'acceptation à tous les niveaux de l'université. Tout le monde était d'accord sur le fait que le résultat global devait être de fournir un programme rigoureux de haute qualité qui mènerait vers les professions de sciences de base, les professions de santé globale et les professions de santé basées sur la défense des intérêts. La modalité en ligne devait améliorer l'accessibilité à des programmes menant à un diplôme et devait également répondre à divers besoins d'apprentissage des étudiants et des étudiantes. L'innovation a joué un rôle primordial dans le développement du programme, elle était fondée sur la théorie de l'éducation et sur les pratiques de développement de programmes d'études.

In September 2016, Queen's University launched the first, fully online, 4-year Bachelor of Health Science Honours (BHSc) degree program in Canada. The program's goals are two-fold: (a) to develop a rigorous academic program, yielding graduates that are competitive for health-related graduate and professional programs; and (b) to provide online undergraduate training that is accessible to students from varying socio-economic backgrounds and/or those with personal circumstances that make attending traditional face-to-face courses difficult. In the first three years, the program saw 14,375 course enrollments across 8,331 full- and part-time students. The BHSc course development team has purpose built 33 courses as of July 2019, and Arts & Science Online has provided access to another 134 courses as options and electives. Online courses are divided into six learning tracks with all assessments and activities aligned to a framework adapted from the CanMEDS competency-based framework and program learning outcomes. An overview of the program can be found at https://bhsc.queensu.ca/future-students/online-degree.

There has been an explosion in the popularity and availability of online courses and degree programs (Bates et al., 2017; Lederman, 2018; Parsad et al., 2008). There is also growing evidence that online courses can provide equal if not superior training opportunities across a wide range of student demographics and interests (Hannay & Newvine, 2006; Johnson et al., 2015; McArthur et al., 2007; Means et al., 2009, 2013; Ni, 2013; Sullivan, 2002). Unfortunately, there is a dearth of Scholarship of Teaching and Learning (SoTL) exploring ways to leverage the online environment to monitor, explore, and triangulate the effective alignment between learning outcomes (program and courses), course assessment, and instructional strategies (i.e., constructive alignment (Biggs, 1996)). What sets Queen's University's fully online BHSc program apart from other online programs is the use of backwards curriculum development approaches anchored in the Understanding by Design (UbD) framework (McTighe & Wiggins, 2012; Wiggins & McTighe, 2005) and competency-based education frameworks (Frank et al., 2010). In line with traditional backwards design, the BHSc curriculum is not built upon statements of intended learning outcomes; rather, the program uses applied assessments as the basis of curriculum alignment and learning outcome design. Our proprietary software allows us to monitor and publish the impact of our instructional approaches and the assessed coverage of our learning outcomes at both the course and program level.

There is strong evidence that assessment drives learning (Fent et al., 2015; Wormald et al., 2009), and as such the BHSc program was developed with assessments as the benchmark for instructional design. Our process of curriculum development included three sequential stages suggested by the UbD, including (1) identification of desired results, (2) determination of required assessment evidence, and (3) planning of learning experiences and instruction (McTighe & Wiggins, 2012). Learning outcomes at the level of courses and program were embedded within the Royal College of Physicians and Surgeons of Canada (RCPSC) Competency by Design framework (Frank, 2005). The choice to use the RCPSC framework was made after consultation with our interdisciplinary partners. A tracking system was developed to link assessment criterion (primarily through rubrics) directly to learning outcomes and competencies. To support this approach, we created advanced software to provide ongoing display, tracking, and/or flagging of student performance across learning outcomes and competencies.

The BHSc program is uniquely positioned to leverage SoTL to enable continuous development and improvement. By creating a curriculum monitoring system with a plan for sustainable triangulation of learning outcomes, assessments, and instructional approaches, we are effectively situated to strategically evolve the curriculum and/or program outcomes while studying (and potentially correcting for) intended and unintended outcomes. At the time of publication,

initial efforts to triangulate assessment, instruction, and learning outcome data has begun and promises to add to the teaching and learning literature while improving the BHSc program.

This paper reports on the experiences of various stakeholders (administrators, faculty instructors, curriculum developers, and faculty members) involved in the planning and development of the BHSc program to understand the perceived strengths, weaknesses, and recommendations for improving the process and/or program.

Method

We used a qualitative case study method (Stake, 1995; Yin, 2014) to evaluate the issues associated with the adoption and pre-implementation process for the BHSc online program (Flyvbjerg, 2011; Harrison et al., 2017; Stake, 1995; Yin, 2014). The case study was approved by Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board.

Setting and Participants

This case study took place at Queen's University and occurred prior to the implementation of the BHSc in the fall of 2016. All stakeholders who were directly involved in the development of the program had the opportunity to participate. Fifty-four key stakeholders involved in the developmental process were invited to participate in interviews; 35 interviews were conducted. Interview participants included: 20 administrative leaders that comprised administrators, administrative staff, program directors, financial executives, and curriculum committee members (nine of these were also faculty instructors); 3 faculty instructors; and 12 curriculum/instructional developers (including instructional, graphic and web designers, and program development associates). In addition, 14 faculty members who would be teaching courses for the new BHSc program participated in one of three focus groups.

Data Collection

Semi-structured interviews with 35 key stakeholders and three focus groups (FG) with teaching faculty (FG1 $n=3$, FG2 $n=8$, FG3 $n=3$) were conducted to understand participant experience in the planning and development of the BHSc program, as well as their expectations for the future of the program. The interview questions were divided into four components: (a) perceived roles, (b) program effectiveness (design/development), (c) expectations for the BHSc online program, and (d) general questions (e.g., strengths and challenges of the program, overall recommendations for improving the program). Appendix A describes the focus group questions asked of the course instructors, and Appendix B outlines the interview questions for the educational leaders. The interviews and focus groups were conducted by three members of the research team once informed consent was obtained. For the focus groups, a second member recorded field notes and summarized content. The interviewers were not associated with the adoption and implementation process of the BHSc program to address reflexivity and mitigate bias, but findings and protocol development were informed via multiple discussions by a (then) co-director education (RE). The director did not inform questions or codes directly, but rather answered questions and provided context for interpretation. In this way, the lived context of program development was provided, but inherent confirmation biases were guarded against.

Interviews and focus groups were conducted until data saturation was reached. All interviews and focus groups were audio recorded, transcribed verbatim, and de-identified using pseudonyms.

Data Analysis

Transcribed interviews and focus groups were analyzed using thematic design. We used open-coding in Atlas.ti 7 to allow categories and themes to emerge from the data (McMillan & Schumacher, 2010). Three members of the research team independently coded Interview 1 and FG 2 and compared codes until shared meaning was reached to ensure inter-rater reliability. There were 392 independent codes that emerged from the data, which were subsequently grouped into seven overarching themes and 16 categories (Table 1). Quotations were identified by interview (I) or focus group (FG) number to protect the anonymity of the participants (e.g., I1; FG1). Where appropriate, differences in perspectives have been noted between three distinct groups of participants: administrative leadership (AL), faculty instructors (FI), and curriculum developers/instructional designers (CID). There were nine FIs who were also ALs, and one CID who was also an AL.

Results

Table 1 presents the seven themes and 16 categories that emerged from the data.

Table 1
Emergent Themes and Categories

Theme	Category
1. Vision	a) Program Evolution
	b) Buy-in
2. Desired Program Outcomes	a) Rigor of Program
	b) Student Learning
	c) Professional School Acceptance/Employability
	d) Accessibility
3. Administrative Process	a) Program Approval Process
	b) Finances
	c) Staff/Faculty Recruitment Process
	d) Student Recruitment Process
4. Innovation	a) Uniqueness of Program
5. Impact of Program	a) Local to National/International Level
6. Communication and Collaboration	a) Leadership
	b) Concerns and Conflict Resolution
	c) Challenges of Collaboration
7. Uncertainty	a) Unknown Outcomes

Theme 1: Vision
Program Evolution

This category emerged from the administrative leadership interviews as many of them discussed how the concept of the program initially emerged, and how the central concepts and philosophies evolved and solidified throughout the process. As one leader described,

> What became really clear was, 'Why would we ever off[er] a program targeted to helping people get into medical school when there is an advanced placement nursing program, physio[therapy] and OT [occupational therapy] graduate entry programs?'…So it was there that we went from...e-pre-med originally to e-pre-health. (I23–AL)

Many of the administrative leads believed that the online courses already being offered required updating in terms of educational practices:

> When I was acting [XX], I started realizing that we had some online courses that could be really upgraded. I saw that the online world was really being undervalued. I saw some opportunities for approaches that would really advance the educational practices [that] were really not being embraced. (I4–AL/FI)

Buy-in

Most participants indicated that they had either accepted the concept of the online program from its initial conception, or as they became more and more involved in collaborating with the curriculum and design team, they began to see the strengths of the program from curriculum design, assessment, and flexibility for students.

> Flexibility is our biggest thing. Students can take one course, two, three or however many they want to take per semester. We are not limiting. You do it at your own rate. If you can do 2 modules in one week and work ahead because you know you are busy...I think flexibility for the online is one of the hugest advantages. (I10–CID)

> …I am tremendously positive and excited...I think it will be great. It will distinguish us in so many ways and all of which are very positive. And I think as we move forward it will be very critical for all stakeholders, the Registrars' Office, the Faculty of Arts and Science…to remain engaged with the Faculty of Health Sciences about this. (I9–AL)

Theme 2: Desired Program Outcomes

Rigor of Program

The Rigor of Program category focused on a desire to ensure the online undergraduate degree would be equivalent to, if not surpass, the quality of education that one would receive in the face-to-face, on-campus program, as described by the AL and CID groups.

> We are working so hard to generate a program that provides the learners with an equivalent type of degree. Not an equivalent experience but the equivalent quality of a degree from [name of institution]. And that it meets that standard and prepares them well for whatever they want to do. (I23–AL)

> I think it will provide the same education that in-class education will. It will be a different way to learn and a different street to go down to get to that end goal. But I think that online learning really is going to provide the same end result as in-class learning I hope….The program should and does expect that anyone who is a successful graduate of the program will be beyond adequately prepared to find success either academically or professionally moving through the program. (I28–CID)

> I would hope to produce excellent training and educational pedagogical experiences….And I would hope that people come out with applied skills much more so than some of the existing programs where they might be able to memorize a million details but they can't read and write, they can't create an argument, and they can't problem solve. I think the emphasis here ...I sound sort of unilateral when I say that but it is very common to have grad students who have never written anything that anyone has reviewed before. They have not been forced to create an argument, and they need those skills for thesis and such. I hope those sorts of skills are promoted. (I17–AL/FI)

However, a common topic of discussion in the focus groups was how laboratory courses or laboratory components of courses would be built into an online format.

> So that is something that we have to think about. So how much value does having a lab experience add to the overall learning experience? In my opinion, it adds quite a bit. If you want to learn anatomy to have cadavers that you can dissect offers something that you cannot get from textbooks or images online. The same concept applies to other labs as well. (I34–FI)

Additionally, faculty instructors and occasionally curriculum/instructional developers were concerned about how best to do student assessments and deal with academic dishonesty.

> How do we prevent cheating?…There's more opportunities to cheat in online courses as there are in in-class courses. How do we make sure that the student was taking the course is the student that actually signed up for the course? And doing the assessments and everything. There is so much at stake in professional schools that I don't know what students could potentially resort to? (I34–FI)

Student Learning

This category focused on what the program strived to achieve in terms of student learning. Most administrative leaders believed that simultaneous tracking of competencies and learning outcomes established a foundation to track students' progress across multiple dimensions of ability and to enable them to engage in the learning process by discovering and working on their strengths and weaknesses.

I think because we have focused on competencies or learning outcomes…we have been able to define things we want to see the graduate of this program will have and the skills they should have and the learning outcomes we want them to meet. (I21–AL)

Because it is a competency based program, I would say that students are really good at demonstrating their skills and abilities for a particular course. In terms of online learning I often talk about the big ideas of a course and that they really understand the big ideas. A lot of these are really content heavy but it is these big ideas or big concepts that follow you throughout the other courses so that has been developed well enough that they have a framework and can move on to the next course and be successful with those courses. (I3–CID)

It will impact the students in the whole way that they work. The learning experience is going to be completely unique to students unless they have already gone through competency-based structure elsewhere. But, I doubt that has happened and that is one of the significance [components] that we have here. (I19–AL/FI)

Professional School Acceptance/Employability

There was a general desire by all three groups, for graduates of the program to be both accepted into quality professional schools for various health care professions and be directly employable in the health field with their degree.

Students will have a direct evidence of competencies so they can show different employers what they have done and they will be able to demonstrate where they are strong. I think that will help the students a lot who are applying to professional programs. It will help professional programs because they are all competency based anyways. And I think it will help the students themselves be more prepared to answer questions on it because they will actually know what competencies are. At the beginning of this, I didn't really know what a competency was. (I8–AL/FI)

Of course, the curriculum design is geared towards employment in the grand scheme of things and I think that is a unique aspect of the program. It provides those learning pathways. The curriculum within those learning pathways are designed to take students into careers or further education within health sciences. (I28–CID)

Finally, one FG2 participant noted, "I think it will prepare them to apply for health related jobs and should give them a pretty good background in science and different aspects of the sciences."

Accessibility

A goal of the program was to ensure accessibility for students with financial or life challenges, where the on-campus experience was not a viable option.

People can be doing it from places all across the country and all across the world where they normally would not be able to afford financially or life-wise to be able to just pick up, leave, and move to Kingston. And so I am hoping that it will be a huge opportunity for those people. (FG3)

I think a huge impact will be that they can do their own scheduling. The program is really for students who can't or don't want to come to campus. So people who have part time jobs or full time jobs or who have dependents or anything like that or living in a remote area and have family obligations. They can access the program and get a good solid education and not have to be right on campus. (I8–AL/FI)

So that means there is a huge interest. It opens up more opportunities for students who have that interest to be able to take that course on their own time and not having to take the bus to school if they can't afford transportation. They don't have to take time off work if that is not part of their lifestyle. So, I think increased accessibility through online programs is extremely important. (I24–CID)

There was, however, one respondent who spoke about the non-uniform access to telecommunication infrastructure in remote areas of Canada and beyond, the very geographical areas touted as being ideal candidates for access to online higher degree programs.

I have spent a fair bit of time in the north and I don't think it will work because I don't think they have the necessary infrastructure to actually run the web based things. For instance, I just spent a week in Nunavut and just to get email you might be waiting a minute with signals going around in circles. And that is in the largest city in Nunavut. So, if it is to actually get people in remote and rural regions it will depend on the high speed connections. And that is going to be true globally… (I17–AL/FI)

Theme 3: Administrative Process

Program Approval Process

The process also required effective collaboration between departments. Administrative leaders noted logistical challenges when attempting to merge this new program into a traditional university structure.

That is a concern that…the online nature of the program does not seem to fit well with the structure in the Registrar's Office and their ability to process applications and report back to us. (I33–AL)

[With] admissions we face numerous problems and the same thing with IT [Information Technology] services. Totally unforeseen barriers that seem to come out of nowhere, are completely unnecessary and throw a massive wrench into things….And it was the same with admissions because we have had difficulty getting our admissions open for students. And it is not just that there are numerous small and large strategic decisions that need to be made along the way it is that the admissions folks have just assumed that they can just activate old procedures. (I2–AL/FI)

Finances

This category focused on the financial requirements of starting the online BHSc program. Participants from all three groups discussed the high costs of both developing and continuing to offer this program at a high academic standard. One participant stated, "I mean we are in a restricted fiscal environment anyway but online learning costs a lot to do well" (I10–CID). Another participant stated,

I think we are probably doing it differently than anyone else at the university or even further and beyond that has done it. Each part of the process is so customized to the courses. The customization is what costs. You really have to invest a lot of money into online development in order to do it well. More than I would have thought. (I2–AL/FI)

The administrative leaders highlighted the potential for making the program self-sustainable through innovative and specialized funding.

Funding for education comes from the province. Then it is important that the province recognize that Queen's University is doing something distinctive within the province and that the educational mission of the university and the economic pressures of the province are coming together in a very positive way. (I9–AL)

The whole financial environment at universities these days is terrible. I think part of the idea of the development of what we are talking about here was financially driven as well. So, how can we come up with new creative and innovative ways to educate [and] at the same time increase the dollar aspect associated with it? And so, financially it will be a positive influence and impact on the department. (I19–AL/FI)

Staff/Faculty Recruitment Process

This category identified how staff and faculty were recruited to the program. According to administrative leaders and faculty instructors, staff and faculty were recruited by an administrator asking if they would be willing to teach in the program or telling them that it was a requirement due to their expertise and position.

One day I was sitting in my office and my boss came in. [She] had just agreed upon hesitantly to teach one of the courses in the global and population health stream. And she was like, 'I could use your help. Are you interested in education?' I did have an educational background so was like, 'Yeah, I could see how I could help you'. And literally that afternoon I was in an instructional design assistants (IDA) meeting and we were changing a whole course from start to finish. (I34–FI)

Another participant stated, "By [our department head] thinking of who has the expertise and then asking the faculty member and/or telling the faculty member if it is part of the workload that this is what they are doing and then we proceed" (I2–AL/FI).

Student Recruitment Process

This category identified how marketing and promotion were seen as key to a successful student recruitment process. The administrative leaders believed it was important to clearly articulate the recruitment message in the marketing and promotion strategies.

I think there will be a strategy to target remote aboriginal communities. How else would they know about us? We can send stuff out to high schools and guidance counselors but if they are not sending the stuff to the students then they will just never hear about it. (I5–AL/FI)

As much positive PR for the university and advocate that we are taking different approaches to education...that [it is] really going to be tailor made for individuals depending on their circumstances. I think it is a really important message for the university to be sending. (I9–AL)

Students were recruited primarily through word of mouth, Queen's University's website, and an offer of admission to those that were not accepted into their on-campus program of choice at the institution.

Our ed[ucation] tech[nology] people are very good at positioning our website. So for example by linking the OHSE [Office of Health Science Education] to the Bachelor of Health Sciences and graduate school with Health Sciences and linking all of these internal places you increase your hits on Google or rating on Google. (I1–AL/FI)

I know that sometimes students are being recruited if they applied for another program at Queen's University and if they were not accepted then this program would be suggested as well. Also there must be some advertising that is done online for the program for distance students. (I35–AL)

Theme 4: Innovation

Uniqueness of Program

The BHSc program was often discussed by the administrative leader and curriculum/instructional developer groups as being unique in Canada as it is the first fully online undergraduate health sciences degree that also encompasses an original online learning platform where students and faculty alike can track student progress, and explicitly connect the students' progress to learning outcomes and competencies.

> It is also a new type of online learning experience and a new innovative applied way to do online work especially at the level of a program…that internal connectiveness across an entire program where faculty are talking to each other. They are merging and matching learning outcomes. They are thinking about the entire learner experience as they evolve through the program as opposed to through specific courses. I think that will…change the way people see program development and see program tracking. (I1–AL/FI)

Another participant noted, "When I started doing the research on how we design this I looked at other leading Universities….They have just courses and they are not connected. So, I really love that this is going after a specific niche" (I6–CID).

One of the most discussed aspects of developing the BHSc online program was the course design process. The vast majority of participants highlighted the way the curriculum was developed through a modified backwards mapping design that ensured assessments were focused on the learning outcomes and competencies within each course. This was seen as an especially innovative way of thinking about course design for health sciences faculty instructors who had little training in this area of instruction.

> It is all competency-based framework now for our exams. The one thing that is really good when you are developing a program from scratch is that you can build your evaluation and what you want to get out of a course first and then design the course accordingly. So that is an advantage that we have and that is the most important part of this online program I think. Usually the evaluations do not reflect very well the content of the program or what you are expecting the students to learn from. But this way it is like a reversed engineered process and I think it is very effective. (I30–FI)

> It has been probably the most important aspect throughout. Assessment is often considered even before the curriculum is developed. It is like looking at it backwards and looking at what we want the outcomes to be and then working backwards from that. So assessment has been paramount throughout the program development. (I22–AL)

> Whereas we are doing it the reverse way where the assessments come first which means that you have to put a lot more thought into what you are going to teach. But also what you want them to know at the end. (I26–CID)

Theme 5: Impact of Program

This theme emerged as many participants discussed the impact that this online BHSc program could have at the local, national, and international level.

Local to National/International Level Impact

The majority of participants discussed how the program would have an impact locally, provincially, and nationally.

> I really love that this [BHSc] is going after a specific niche. Health professionals are needed and this is a base for health professionals…so it is a pretty big clout in Canada and around the world…It is fantastic that they brought this all together and that you actually get a degree at the end. (I6–CID)

> …if China and India realize this...as long as they can do English speaking courses this is a massive opportunity for them to get a North American English speaking degree which qualifies them to go into any grad school in North America without English proficiency tests. They are considered one of us. So the opportunities are huge as a gateway and those big countries that they come. (I5–AL/FI)

Theme 6: Communication and Collaboration

Participants discussed the crucial nature of inter- and intra-departmental communication and collaboration as related to the facilitators and challenges during the adoption of the BHSc program. This theme consisted of three categories: leadership, concerns and conflict resolution, and challenges of collaboration.

Leadership

All participants believed that the leadership needs for developing the BHSc online program focused on the importance of having appropriate communication at all levels of the organizational structure.

> This is a new program and it has never been done but it is hard [when the]…people below they don't necessarily understand the greater vision. And so that is why the communication is so important. If everyone knows what the goal is at the end of the day then it makes sense when changes are made. But when that doesn't happen people get annoyed and irritated and confused and then that trails into their work which it never should. (I14–CID)

> This is really where [XX] really shone…[XX] sold the program. From my perspective [XX] has taken this curriculum that I developed in my nerdy ed/psych/science-y/health education kind of ways and made them accessible and interesting and exciting. [XX] has really sold the program. I think that has been very effective for a lot of people. (I1 – AL/FI)

However, for some of the curriculum and instructional developers, conflict arose when individuals felt there was a lack of communication or uncertainty about what they were meant to be accomplishing. For example, one participant stated, "Sometimes good. There is definitely a strong sense of purpose. Everyone is…pushing to do better. There is not a lack of inspiration. Sometimes I wish there was more management" (I11–AL/CID).

Concerns and Conflict Resolution

A number of concerns were discussed by all participants. These were mostly related to the perceived tight deadlines (e.g., I29-CID), collaboration with the Educational Technology Department, technical difficulties in bringing courses online (e.g., I2-AL/FI), working within an existing traditional university, and overall lack of experience in developing an online degree program (e.g., I34–FI). One participant said, "I like to think that I know technology but they [educational technologists] just know it at a whole different level. They have a whole different language and sometimes it is hard to get on the same page" (I10–CID). Another noted,

> So it is getting faculty members to rethink the way they are doing things. They are refreshing their content if nothing else which is a huge bonus. As you can imagine there are some faculty members who have been doing this a while. And when they are asked to do it online they will do the same thing they have done for the last 25 years. (I5–AL/FI)

Many individuals discussed the importance of being able to resolve issues that would unexpectedly arise due to a new barrier presenting itself at various stages throughout the implementation process.

> The timeline meeting, I use as a vehicle to get people's frustrations out in the open and fine tune expectations if they are going off course—air those frustrations as a group so that it does not become something that just festers quietly. Then I work with everyone individually throughout the week, check in and support, and provide more of what they need. So whether it is just an ear or whether there are tangible things that I can do. Problem solving. (I2 – AL/FI)

> A lot of the time I felt like some of my work was not being attributed to me but to professors. I got really frustrated by that. And then also it was difficult sometimes to work with...sometimes it was challenging to work with some of the education experts because we would butt heads....that was not challenging in a frustrating way, it was challenging in more of just something that we had to work through together. (I11–AL/CID)

Challenges of Collaboration

Most participants perceived that collaboration, although important to the success of the new BHSc program, could be challenging. There was resistance by some groups and individuals within the institution to collaborate on the program's development, even though participants perceived the institution was stronger when collaborating as a whole rather than focusing only on the benefits of individual units.

If we attempt to do this in isolation, those groups not participating with us are potential pitfalls that we could experience…It is all good and fine to say that the degree plan is in the Faculty of Health Sciences but this has got to be seen as a cooperative effort with the [other offices and faculties]. Only then will we really get that level of success and the exposure provincially, nationally and even internationally. (I9–AL)

I would say finding the right team is definitely a challenge. You need people with complementary skill sets who are going to work well together. You need team players who are not in it just for themselves and you need people who are professional and respectful of faculty instructors because they have a really important role. And also understanding that part of being a team means collaborating but also compromising at times. And not getting stuck on little things but looking at the big picture. I mean the collaboration piece is huge and if a team is to be effective then people have to be collaborative and not just looking out for their own interests. I think that is probably one of the bigger challenges. (I3-CID)

Theme 7: Uncertainty

Regardless of the amount of work, effort, and resources that had been given to ensure a successful learning environment, students had yet to actually begin the program and this highlighted a level of uncertainty about its success. One category emerged within this theme: unknown outcomes.

Unknown Outcomes

When implementing a new program, there are many outcomes that cannot be determined prior to the implementation. There was much discussion by ALs and CIDs about the unknowns and prospective future sustainability of the program.

It will be very interesting after those five years and having that data in and like you said, are they [the graduates] employable and is it really working? Does it give them that core foundation? Are they stronger students? Are they better advocates? Are they professional? Are they great collaborators? Are they leaders? We will see that—how they work and what they choose to go into….Whenever you are a pioneer, you are making decisions that you don't necessarily have concrete evidence that it is the right decision. (I6–CID)

So from the professional schools (specifically the medical school, nursing, and rehabilitation schools), I see the fact that they will be waiting to see how well this degree plan has done in training students for the next challenge professionally. So, it is very much a wait and see. (I9–AL)

Finally, one participant said, "It will come down to how these students are received. No one knows how a student who is engaged in a program fully online will be welcomed and capable of integrating into the classroom setting" (I5–AL/FI).

Discussion

This study reports on the experiences and program expectations of key stakeholders in the development of a new, fully online competency-based BHSc degree program. The major findings suggest that the successful development of the program was due to strong vision of what the program would offer the university and incoming students, and how it encouraged buy-in at all levels of university administration and teaching. There was overall consensus that the desired outcomes are to provide a rigorous program that fosters future professional and employment paths, improve accessibility to university degree programs, and attend to all student learning needs. This study recognized the importance of the administrative process in developing and offering a new online BHSc degree to ensure the program had approval from all levels of governance, was financially viable, and had an effective recruitment process for ground level stakeholders. Moreover, it recognized that there is no perfect system of development, but a shared vision and a willingness to flexibly collaborate is essential to meeting intended outcomes. Innovation played a vital role in the program's development as stakeholders understood that it required a unique approach that was built on sound educational theory and curriculum development practices. Effective communication and collaboration strategies were crucial and were achieved through strong leadership, the identification of stakeholder concerns, and effective conflict resolution strategies. Underpinning the development process of creating and implementing a new way of providing a BHSc degree program lies the uncertainty of achieving the intended outcomes.

Systems Change

The implementation of a new fully online Bachelor's program within a traditional university model required a systems-level change. Behavioural, teaching, and administrative changes were required at every level of program development and implementation: from convincing stakeholders of the usefulness of a fully online degree program developed from scratch, to changing the way faculty approached course development, to working with university administration to change the student application process. Anderson (1993) described six key elements to systematic change in education: vision, political support, networking, teaching and learning changes, administrative roles, and policy alignment. Kendrick and colleagues believe that a diverse set of leaders at all levels are needed to both mobilize and influence other stakeholders (Kendrick et al., 2006). While the initial ideas for the BHSc came from a small number of stakeholders, the vision expanded as they sought buy-in from others to share leadership and develop the program. A focused vision from leadership was discussed in our stakeholder interviews as having a significant impact on the program's successful development. Next, leaders needed political support or buy-in from fellow stakeholders, university administration, faculty, and provincial governing bodies. Stakeholders needed to network with fellow stakeholders and work together towards a common goal. Of significance were the teaching and learning changes required. Faculty changed the way they developed their courses by focusing on competency-based guidelines and using backwards mapping to build their courses and assess students. Additionally, changes to administrative roles were needed to accommodate a fully online degree program.

It was especially challenging to move from traditional lecture-based instruction and memory-based assessment to backwards mapping and competency-based assessment. This change was most difficult for faculty who had never before thought about building assessments during the initial phase of course development. Learning track teams were created to ensure that course

material didn't overlap more than necessary between courses and that courses developed critical skills needed for subsequent courses. Learning track teams are dedicated to informing and collaboratively evaluating the assessment of learning outcomes and associated instructional strategies across disparate health sciences content areas. This investment in quality establishes ongoing and facilitated discussion between faculty members. In some cases, non-faculty members act as a "go-between" informing faculty of non-meaningful redundancy (i.e., redundant content that is not part of a spiral curriculum), and in other cases facilitate discussions and curricular development calibration. This change in approach to course development required a team of instructional developers and designers, curriculum developers, and faculty working together to develop every course.

Leadership, Curriculum Development, and Educational Theory

The idea for a fully online degree program began with discussions between university leaders. Early leaders worked to help stakeholders develop a shared vision, buy into the program and work together: a critical role of successful leaders (Fullan, 2003). Kotter and Cohen (2012) argue that people rarely implement change based on a rational thought process, but rather change through more of an emotional process a "see-feel-change" (p. 11). In this study, there was much discussion from stakeholders about the persuasive nature of the leadership and how it influenced others to buy into the program's vision. Stakeholders stated that they were approached directly from leadership to fill a specific role, voluntarily or not, which corresponds directly to Leithwood and colleagues argument that, "school leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment and working conditions" (Leithwood et al., 2008).

Study Limitations

We only interviewed stakeholders that were a central and integral part of the development process. It is possible that these views may have been biased towards the success of the program. However, we included the perspectives of a diverse selection of individuals and groups involved in the program's development. Due to the ongoing nature of the evaluation process, we were unable to speak of the program's success after implementation. This paper reported on the developmental process and therefore only evaluated the pre-implementation phase of the program. Finally, this fully online degree program was developed at only one university and, therefore, limits generalizability.

Conclusion

This paper reported on the creation of a fully online, BHSc program and describes the experiences and expectations of stakeholders. The major findings of this study suggest that the successful development was due to strong vision from effective leaders that encouraged buy-in and collaboration at all levels within the university. There was widespread agreement that the program be accessible to students across the globe, regardless of financial or personal circumstances and address diverse student learning needs resulting in graduates that would be competitive in future professional and employment paths.

During the development process, it was important that the evaluation team remain abreast of unpredictable issues associated with the development of the BHSc program to ensure that data collection protocols continued to evolve in order to remain relevant (e.g., changing facilitators and barriers to implementation strategies). For example, as we began to interview various stakeholder groups, we found that there were specific areas where we wanted to more thoroughly explore (e.g., how the competency-based framework impacted the curriculum and teaching strategies), hence, the protocols changed as data continued to be analyzed. This allowed us to provide a deeper description of our emergent themes and categories.

The findings from this case study demonstrate the importance of three overarching criteria for developing an educational online undergraduate health sciences degree program: (a) visionary and responsive leadership is required to adapt to the constantly changing planning process, (b) communication and collaboration between all stakeholders involved in the process is key to improve commitment and buy-in, and (c) a significant institutional commitment to financial and human resources is required. We believe that our findings can guide those thinking about developing a similar program at their institution. Specifically, we recommend establishing a leadership team possessing a clear vision of what the proposed program will offer students and the institution. Next, we recommend creating a process by which stakeholders from various groups (e.g., university administration, faculty, curriculum developers) can regularly share their successes and challenges and collaborate with each other to solve issues. Finally, we recommend obtaining buy-in from the institution at large to acquire the necessary financial and human resources that will be required.

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Appendix A

Focus Group for Course Faculty

A. Perceived Roles

1. Please state your name, learning track, course(s) you will teach (and if it is a required course – Core or Optional), and your role thus far in the development of the BHSc(H) program.
    a. How do you think your course development process have *influenced your perspectives on Education*?

2. a. How have you been supported in developing your courses, if at all?
    b. How do you think you could have been better supported in developing your course(s), if at all?

B. Program Effectiveness (design / development)

3. How do you feel your course(s) will contribute to the outcomes of the program: (**Prompt:** *how do you feel your particular topic, assessments and instructions prepare students for what they will need to be successful in the program?)*

4. What opportunities/advantages do you see in teaching your course online?

    a. What challenges do you see in teaching your course online? (*Note: May want to mention EdTech here – fist FG didn't know hadn't heard of them)*

5. What do you think the potential impact of the program will be at the national, provincial, and local levels, if any?

6. How would you describe the approach to curricular design in this program?
    a. Why, if at all, do you think the curricular design of this program will be effective?
    b. How do you think the competency-based framework underlying the curriculum will impact the program?
    c. Is there anything else with regard to the curriculum that you would like to discuss?

7. What roles has assessment played in your course within the BHSc(H) curriculum? *(Note: only ask if hasn't already been discussed in detail)*

C. Expectations for the BHSc(H) Program

8. What are some of the biggest impacts you feel this program will have on students?

9. What do you think the challenges will be over the next five years?

10. How were you recruited for this program?
    a. How long have you been involved in developing your course(s)?

11. Ideally, what would the enrollment be in your course and why?

D. General Questions

12. How has or will your involvement in developing your course(s) affect[ed] you professionally?

13. What do you think has been done well in the planning and development of your course(s)?

14. What do you think were the main challenges in planning your course(s)?
    a. If you could change anything about your course(s), what would the changes be?

15. Is there anything about this program that you have not had an opportunity to talk about during this focus group that you would like to add?

Appendix B

Interview Questions for Leadership

A. Perceived Roles

1. In considering your various roles, how do you think you have impacted the development process of the BHSc(H) program?
   a. What do you think are your informal roles in the program, if any?
   b. How do you think the process *influenced your perspectives on Education*?

2. How have your roles evolved or changed since you initially became involved in this program, if at all?
   a. In what ways has this evolution or change been positive?
   b. In what ways has this evolution or change been challenging?
   c. As the program continues to evolve and the first group of students begin the program in the fall, how do you see your role evolving or changing?

3. Is there anything you would have liked to contribute to the program but didn't feel you were given an opportunity to do so? Please elaborate.

B. Program Effectiveness (design / development)

4. Think about the desired outcomes of the program. What do you think the outcomes are in terms of:
   a. Finances;
   b. Online learning;
   c. Preparation for health sciences;
   d. Student learning;
   e. Other specific outcomes?

5. Now think about the potential impact of the program. What do you think the impact will be on:
   i. The province;
   ii. Professional Schools;
   iii. The University;
   iv. Faculty of Health Science;
   v. Department of Biomedical Sciences (DBMS);
   vi. Student perspective of online learning.

6. How would you describe the approach to curricular design in this program?
   b. Why, if at all, do you think the curricular design of this program will be effective?

   c. How do you think the competency-based framework underlying the curriculum will impact the program?

7. What roles has assessment played in the BHSc(H) curriculum?
    d. What do you think these roles will look like in the future?

8. What do you think are the roles of EdTech?

C. Expectations for the BHSc(H) Program

9. What are some of the biggest impacts you feel this program will have on students?

10. Two years from now, what do you think the program will look like?
    a. Five years from now, after the first class has graduated, what do you think this program will look like?

11. What do you think the challenges will be over the next five years?

12. How were faculty recruited for this program?
    a. In what ways was the recruitment strategies effective? Not effective?
    b. How were you recruited for this program?
    i. How long have you been involved in the program's development?

13. How are students being recruited?
    a. What do you think your target student population is for this program?
    b. In what ways is the student recruitment strategies effective? Not effective?
    c. What is your expected enrolment in September? Do you think you will meet this goal? Why or why not?

14. How has your involvement in the planning of this program affected you professionally?

D. General Questions

15. What do you think has been done well in the planning and development process of this program?

16. What do you think were the main challenges in planning the program?
    a. If you could change anything about this program, what would the changes be?

17. What other experiences, if any, have you had with curricular innovation or program design prior to your experience in planning and developing the online BHSc(H) program?"

18. Is there anything about this program that you have not had an opportunity to talk about during this interview that you would like to add?