UBCx “Biospecimen Research Methods Course”

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Keywords: Education, training, quality

Background

BIOSECIMEN-BASED RESEARCH currently accounts for ~40% of all cancer research and the demand for biospecimens continues to increase.¹ This has led to an evolution in the way biospecimens are collected and banked with increased recognition of the need for quality and standards in biobanking.² The biobank community has developed best practices and standards, but dissemination across the broad research arena remains a challenge and implementation requires education to transfer knowledge and training.

When recently reviewing the biobanking education landscape, we noted a need to provide a wider range of learners with education on biobanking. In particular we noted a need to provide education on practical biospecimen handling and biobank technical skills not only to individuals working in dedicated biobanks, but also to a very broad spectrum of researchers in research laboratories. Although we were aware of several biobank education courses that existed at the time, including our own Canadian Tissue Repository Network (CTRNet) biobank education course,³ we noted that these courses were mostly delivered or promoted through local or “biobank” community channels and not as readily accessible to researchers.

Our university, University of British Columbia (UBC), was an early partner university to the edX system. Founded by Harvard University and Massachusetts Institute of Technology in 2012, edX is a massive open online course provider, offering courses from 130 universities and institutions to learners globally, of which UBC is a founding member (UBCx).⁴ This has provided us with the opportunity to leverage UBC's expertise in course development on edX and in delivering education to a global market.

We, therefore, developed and launched a fully online course on the edX platform entitled “Biospecimen Research Methods.” The course is delivered by our expert biobanking team at the UBC, Office of Biobank Education and Research and BC Cancer, Biobanking and Biospecimen Research Services. The course curriculum is based on International Society of Biological Environmental Repositories (ISBER) and National Cancer Institute best practices and is further informed by our direct ex-

perience in operating provincial and national scope tumor biobanks for >25 years and coleading a national tumor biobank network.⁵ We launched our first offering of Biospecimen Research Methods in February 2017 and have since offered seven sessions of the 6-week online course to date.

Methods: Learner and Curriculum Focus

The primary intended audience for the “Biospecimen Research Methods” course is as follows:

- researchers, staff, and trainees working in life science laboratories
- biobank staff such as technicians and technical staff.

Upon completion, learners receive a UBCx Professional Certificate. The current cost of the course is \$99 USD (~90 euros (€)).

For 6 weeks, learners are able to access material online in a staged manner and work throughout the five course chapters at their own pace. The curriculum focuses on:

- the importance and basis of biospecimen-based research;
- how-to collect, process, and store biospecimens;
- the fundamentals of record and data management; and
- issues of ethics, privacy, and informed consent pertinent to working with biospecimens.

The course curriculum was first developed in 2017 but was updated in 2019 to incorporate the newest changes to the ISBER Best Practices version 4.0.

At the end of 6 weeks, learners are expected to be knowledgeable in how to theoretically perform all aspects of biobanking, including areas of consenting, biospecimen and data handling, and have a solid background in why biospecimens are important to the research enterprise. Learners are also taught critical options to source biospecimens in support of their own life science research (e.g., obtaining existing biospecimens from a biobank, contracting a biobank to prospectively collect, or creating a new collection).⁶ It is expected that, upon completion, learners would be knowledgeable candidates to conduct their own biospecimen research projects, contribute to life science research

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and drop, matching, and true/false questions. The passing threshold for the examination is 60%.

The creation of Biospecimen Research Methods took ~20 months and was resourced with a dedicated project manager, supporting team of at least six individuals, and several specialty subcontractors (e.g., individuals with expertise in videography, media art creation, and copyediting). Each course delivery requires a part-time course manager and small supportive team working for ~10 weeks to prepare the launch (marketing and planning) and then engage with learners and manage course communication and troubleshooting activities throughout, as well as some postcourse activities (marketing and statistical analysis). Each course run is administered by a course manager who is available to answer questions and contributes to the online discussion forum by posting questions to spark discussion. The course manager spends ~10 hours per course run administering the course.

Results: Participants and Feedback

A total of 217 learners from >30 countries across 7 continents have enrolled in Biospecimen Research Methods

(Fig. 1). The average number of learners enrolling into each course offering has become steady at ~24 students. To date, of the 217 learners, 150 certificates have been issued (~69%).

The learner profile for Biospecimen Research Methods is as follows: 27% research associates, 35% trainees (undergrad, grad, and postdoctoral), 7% biobank staff, 18% research laboratory staff, and 30% other. Although at the outset we anticipated that many learners would have little or no background in biobanking, we have observed that ~80% of learners who have enrolled in this course have already worked in some research capacity with biospecimens, and are seeking to expand their knowledge base in the biobanking area.

Before commencing the course work, learners are asked to provide answers to a short precourse survey. When asked for their reasons for taking the course, >50% of learners responded that they took the course to advance their career or to learn something new. Only 10% responded that they were considering pursuing a career in biobanking. To date Biospecimen Research Methods has received much positive feedback and is currently rated 4.4 out of 5 online.

Discussion

Our current plan is to continue to offer the Biospecimen Research Method's course at least three times per year (winter, spring, and fall). Specific launch dates for each course offering and further details can be found by searching for "Biospecimen Research Methods" on the edX website.⁴

Marketing is a continued area of development for this course. Early in the course inception, we conducted marketing research in efforts to determine the best approach to connect meaningfully with potential learners and learn about their reasons for seeking the education that our course provided. We have employed organic and paid promotional tactics to support the marketing strategy for this course. Social media (Facebook and LinkedIn) has been employed and a formal unit-level social media strategy will be deployed later in 2019 to support further marketing efforts for Biospecimen Research Methods through the Biobank Resource Centre.

We have learned that, although dynamic, a range of marketing tactics are needed to continue to reach new learners—especially where the subject matter, biospecimen research and biobanking, is developing and becoming more formalized. We have been encouraged by the global enrollment for this program. Moving forward, we will continue to seek the best tactics to promote this course offering to continents that have emerging needs for biospecimen and biobanking education (e.g., Africa and South America).

We believe that it is very important to engage in direct and meaningful dialogue with our learners to keep them engaged and provide feedback as required. To accomplish this the edX platform has a real-time discussion board function. In running this course, the discussion board has been invaluable and poignant in facilitating answering questions about the material, troubleshooting issues, and presenting real-life applications of the learned material. We have had great feedback that this discussion platform, combined with our instructor-learner communication plan, has kept our learners involved and fulfilled throughout the course.

Looking forward, we see value and potential in translating the Biospecimen Research Method's course into other lan-

guages to better connect with a greater learner base and increase reaching a global market. As a first step, we anticipate the creation of a German version of this course that will be launched later in 2019.

Lastly, the course reflects current international biobank standards and supports implementation of standards, including those underpinning the currently available CTRNet and CAP external QA programs, and the new ISO standard.^{2,7} It may, therefore, be incorporated into preparation steps for all biobanks seeking to adopt any external quality assurance program. Since biospecimen-driven research is an increasingly prominent sector of life science research, we plan to continue to optimize the current course offering for researchers handling biospecimens and conducting biobanking in research laboratories. Nevertheless, in the coming years we also intend to add content that is of value to professional biobank learners.

Author Disclosure Statement

No conflicting financial interests exist.

Funding Information

No direct funding was received for this project.

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