CASE STUDY

Facilitation of Student-Staff Partnership in Development of Digital Learning Tools Through a Special Study Module

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ABSTRACT

A student-staff partnership was formed as part of a final year special study module to provide dental students the opportunity to work closely with faculty to produce high-quality e-learning resources in areas of the curriculum identified by the students as particularly difficult. The student-staff team identified the following themes as major influences on the success of the project: student-staff interaction, ownership, managing expectations, time pressures, and co-creation partnership benefits. This partnership resulted in a valuable learning experience for both the students and staff involved. The resource developed was evaluated by junior dental students in second and third year of the five year Bachelor of Dental Surgery (BDS) degree programme at Glasgow Dental School and showed a high degree of acceptability by those in both groups. The quality assurance built into the process has resulted in an e-learning resource that has been incorporated directly into our flipped classroom model for pre-clinical skills teaching.

The importance of staff-student partnerships in learning and teaching in higher education has been stressed by Healey, Flint, and Harrington (2014) and in a number of recent papers (Bovill, Cook-Sather, Felten, Millard, & Moore-Cherry, 2016; Curran, & Millard, 2016; Jarvis, Dickerson, & Stockwell, 2013; Marquis, E., Puri, V., Wan, S., Ahmad, A., Goff, L., Knorr, K., & Woo, J., 2016). These publications identify both challenges and significant advantages of the partnership and co-creation approach.

Dentistry is a dynamic clinical profession that is strongly influenced by developments in technology. E-learning has become an integral part of many dental school curricula, but students have typically been the recipients of e-learning resources developed in isolation byteaching staff. In his paper investigating the relationship between the learner and the university, McCulloch (2009) concludes that the metaphor of "the student as consumer"

implies passivity on the part of the learner who is the "receiver" of a service. However, it is important that as teachers we consider the voices of learners, and one way of achieving this is to involve students as co-producers of e-learning materials. As McCulloch (2009) has indicated, "Co-production requires active engagement with the entire learning process on the part of the student, and sees the student as an active participant in the development of knowledge" (p. 178).

Bovill, Cook-Sather, and Felten (2011) also report on the importance of reconsidering students' roles in their education and repositioning students to take a more active part as co-creators of teaching approaches, course design, and curricula. There are certainly challenges when attempting to co-create learning and teaching materials with learners. Bovill et al. (2016) attempt to address the challenges in co-creation, highlighting a need for transparency to build trust between staff and students. They also state that it may be easier to overcome the challenges of working in partnership when the focus of the partnership is the co-creation of learning and teaching material within an existing course. Their view is that "breaking down traditional teacher-student boundaries, while simultaneously recognising and maintaining the professional standing of academic staff, opens possibilities for redefining and broadcasting understandings of academic expertise in the rapidly changing world of teaching and learning" (p. 206).

United Kingdom (UK) university courses that lead to a degree registrable with the General Dental Council (GDC) must satisfy the intended learning outcomes defined in the GDC document "Preparing for Practice" (General Dental Council, 2015). Since dentists must be competent practitioners upon qualification, much of the Bachelor of Dental Surgery (BDS) programme involves intensive clinical training in addition to the underpinning academic content. As a result, the timetable is busy, and a creative approach is required to identify opportunities for engaging students as co-creators of teaching techniques and materials. However, in common with the initiative of special study modules in many medical curricula (see Byrne, Lewis, & Thompson, 1999), the BDS programme at Glasgow Dental School incorporates a special study module (SSM) option for final-year students. This option offers senior students an opportunity to embark on some additional focused learning in an area of personal interest.

During the 2015/2016 academic session, a new SSM about co-creation of e-learning materials was launched, in which small student groups worked with academic staff and a learning technologist to co-create e-learning packages for use by students in earlier years of the course. The concept was similar to a project in which pharmacy students designed, wrote and developed e-learning teaching materials (see Lam, Au Yeung, Cheung, & McNaught, 2009, for discussion of this project). The case study that follows provides a reflective account from both the student and staff perspective of one of the teams that participated in the first year of this new SSM about co-creation of e-learning materials.

DESCRIPTION OF THE PROJECT

The aims of the SSM were to allow students to (a) interact with their peers to identify one aspect of the BDS programme for which they believed e-learning would be beneficial to student learning and (b) work in partnership with staff members to design and develop an e-learning package which would be evaluated by student users. The aspiration was that the co-created resource would become embedded in routine teaching for subsequent years. This new SSM was offered to fifth-year BDS students through a standard

process used by module leads to present information on the range of SSMs that are available.

At the commencement of the module, the student partners met with the core SSM staff (two academic staff and a learning technologist) to discuss the logistics and approach to be taken. Following a review of all existing e-learning resources, including those available via the Scottish Dental Education Online repository, the student partners designed and distributed a questionnaire to senior students to identify areas of the curriculum in which an e-learning package would have helped them in earlier years of the BDS course. A significant number of respondents indicated that an overview package on clinical procedures in endodontics (root canal treatment) would be very valuable. Endodontics is a subject area which involves highly technical, clinically challenging operative procedures for which there was no quality assured, pre-existing digital learning package.

The SSM ran on alternate weeks for a six-month period, during which time the staff members were available twice a week for up to three hours. However, this was flexible and the students determined the extent to which they required staff contact time, dependent upon their support requirements at each stage of the project. A work schedule and timetable for the entire project was developed by working backward from the fixed end date of the module.

All elements of the work package development were initiated and undertaken by the student partners, including storyboarding, scripting, photography, video filming and post production editing. Content was discussed with the subject expert on the staff team to ensure accuracy, and guidance was provided on aspects such as copyright legislation and methods of assessment. An audio-visual expert provided training and guidance for the students on video filming and editing and their voice-over script was checked for accuracy by the academic subject lead before the students recorded the narration. A small number of required images and radiographs that the students could not access themselves were made available upon request from the teaching collections of academic staff. The final highly technical phase, which involved compiling the materials created by the students, was supported by the educational technologist and included compression of the video footage to provide files of a manageable size.

Junior students on the BDS programme completed a questionnaire to evaluate the e-learning resource produced, and a summary of the responses is provided in Table 1 below. Dissemination of the work was undertaken through an invitation to the student partners to present their e-learning resource at a Dental School Meeting to which all faculty staff were invited.

REFLECTIONS ON THE PROJECT

This section of this case study provides excerpts from the reflections of each member of the student-staff partnership (i.e. two student partners and four staff partners), each of whom provided written reflections in response to an email request. Each team member has been given a pseudonym and the reflections were categorised into key themes.

Both students and staff participants reported finding the project very rewarding and noted that it offered the students the chance to work closely in partnership with staff, which made it unique in respect to the BDS degree programme at Glasgow.

Student-staff interactions

The quotes in this section reflect how the interaction between the staff and student members developed. For example, Alex, a staff partner, reflected that "the student partners were slightly hesitant at the beginning; this is a new relationship with staff after all, however they very quickly relished the freedom they had." Janice, a student partner, stated:

> I did not know what to expect. . . . Our team consisted of an IT expert who took care of the programming of our learning resource, experts in the specialty topic chosen to ensure the quality of the learning material remained high, teaching staff who were able to guide the team on timelines and targets and lastly us—the students who were able to pin point areas of difficulty amongst our peers and were able to design a tool which we thought would best cater to our learning needs.

The sentiments of "not knowing what to expect" and being "slightly hesitant" reflect the need to break down traditional teacher-student barriers early when students are involved as partners. The last phrase in Janice's comment powerfully highlights the value of student-staff interaction in the development of teaching materials that satisfy learner needs.

Ownership

The level of control over the subject matter and the design of the resource was welcomed by the student developers, as Beth, a student partner, indicated: "I liked that the module allowed us to express a level of individuality and creativity, while focusing on a subject of our choosing." This comment highlights the value of switching the traditional role of students as "receivers" of educational material to that of active creators of materials for other learners.

Managing expectations

Ensuring that goals set by students are realistic in relation to the project's time constraints and other available resources is an important role for experienced staff partners, who must exercise this duty without causing disillusionment or loss of motivation. Alex, a staff partner, commented: "My role quickly evolved from encouraging active participation to …. keeping an eye on what was realistic in the time allocated."

Time pressures

Unsurprisingly, time was a major factor for the whole team. The student developers were concerned about managing this project as well as completing a demanding final clinical year of their degree, whilst staff had concerns about their own workload. What the following quotes reflect, however, is the immense satisfaction that followed the effort expended and the recognition by staff that the teaching resource developed actually saved them time in the long term:

> When I started the SSM, I knew that it would be hard work. However, I think I initially underestimated the time and dedication needed to make our project a success. . . . Because the SSM was student led, the success of our project greatly depended on how much effort we were willing to put into it. . . . The hours spent on

the project exceeded the hours spent on any other SSM but I also think the rewards were greater. (Beth, Student Partner)

I had imagined that the task would be an onerous one, swallowing large amounts of time in my already hectic schedule. However, very quickly it became apparent that this would not be the case. . . . in reality it has saved significant time in the production of teaching material. (John, Staff Partner)

Co-creation partnership benefits
The experiences of all team members supported the view that it is easier to overcome the challenges of working in partnership when the focus of the partnership is the co-creation of learning and teaching material (Bovill et al., 2016):

I am very proud to have been part of such a hard-working group of students and staff. We created strong relationships with the University of Glasgow staff working on this project with us, who viewed us as peers and not just as students. I believe that this collaboration between students and staff contributed greatly to the success of this project. (Beth, Student Partner)

This SSM also allowed us to work closely with teaching staff who, for the purpose of this SSM, were our colleagues instead of our teachers. . . . in fact at times we as students were expected to lead the team. It was not as daunting as it seemed and they respected our views and input just as much as we respected theirs. Once we overcame the initial student-teacher barrier the work flow and level of productivity quickly increased and our meetings became quite exciting. (Janice, Student Partner)

Both of these student comments reflect very strongly on the collegial working relationships that developed between the student and staff team members, with little evidence of a hierarchical dynamic.
The ability to achieve this productive and exciting working environment in a short period of time is testament to the positive attitudes and respectfulness of all parties involved.
For example, Brian, a staff partner, explained that he "[loves] the experience of seeing the students planting the seeds of their own learning packages and then harvesting those plants in a form of high quality, engaging and interactive activity-focused resources." This positivity and respect was echoed by Claire, the Educational Technologist, who wrote:

Having worked with many academic staff . . . , it was different and quite refreshing to work with the students, with their insights into design and the drive that they showed to complete the project on time. . . . I was so pleased to see the dynamics of the group develop over time as well as watch their confidence grow in technical as well as "soft" skills like group working. (Claire, Educational Technologist)

In summary, this was a true "win-win" exercise for all parties involved. The students' perception of learning needs and the type of e-learning tool that would satisfy the requirements were combined with the academic and technical skills of the staff members,

with all parties reporting very positively on the experience. The student members gained a significant number of new skills, many of which were transferable graduate attributes, and also gained immense satisfaction from developing a digital learning package that is now used for undergraduate teaching. This is true student-centred learning and teaching in all its forms.

STUDENT USER PERSPECTIVE

As part of the SSM, feedback on the packages developed was sought from two groups of undergraduate students using an online questionnaire. This questionnaire, using a five-point Likert scale, asked to what extent respondents agreed with the following statements:

1. The content of the e-learning package was consistent with the intended learning outcomes outlined.
2. The material was set out in a clear and logical way.
3. The self-paced nature of the learning was a good feature of the e-learning package.
4. I would recommend this e-learning package to others.
5. The quiz appropriately tested the material presented within the e-learning package.
6. I would use this e-learning package for revision purposes.
7. The package has improved my understanding of this topic.

One of these groups (BDS 2; n=68) had used the package in a flipped classroom exercise on endodontics, and a second group (BDS 3; n=89) had already completed their endodontics pre-clinical skills teaching. Whilst the focus of this paper is on the staff-student co-creation of the e-learning package, the combined data in Table 1 demonstrate the high level of acceptability of the final product by both groups of students surveyed.

Table 1. Student feedback on the endodontics e-learning package co-created by the student-staff SSM team (n=157)

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1			1	67	88
2		1	1	61	95
3			2	61	95
4		1	5	76	76
5		2	19	85	50
6	1	2	14	66	75
7	1	2	30	88	37

CONCLUSIONS AND FUTURE PLANS

One of the palpable sentiments threaded through the independent reflections is the sense of fulfilment experienced by all the team members as a result of their joint success. This was evident in their personal satisfaction with the excellent working relationship that developed, the digital product itself, the positive feedback from users, and the presentation

by the student and staff joint team, which won the prize for the best presentation at the ninth University of Glasgow Learning & Teaching Conference. It was enlightening for the staff members to see the perspective of the students in the package design, but also an eye-opener for the students about academic life and the effort that is required to produce effective teaching materials.

The reflections from the various stakeholders in this SSM, based on co-creation of digital teaching materials, speak for themselves. The comments by authors quoted in the introduction to this paper about active student engagement in co-creation (McCulloch, 2009; Bovill et al., 2011) came to life during the six-month project, and the possibility of breaking down traditional student-staff boundaries to share expertise and insight into development of learning tools was fully realised. In addition to the valuable learning and experience gained by both student and staff partners, an excellent digital learning resource has been created by students for students. The quality assurance built into the process has resulted in a package that has been incorporated directly into our flipped classroom model for pre-clinical skills teaching (Crothers et al., 2017).

There were, not surprisingly, some challenges that needed to be addressed. The issue of scoping the work in relation to the time available was a particular problem, but guidance from the staff members ensured that aims were achievable. Even so, the students expended considerable effort in their free time to ensure completion, a mark of their commendable enthusiasm and drive.

Following the success of this first year of the e-learning SSM, it has been continued for a second year. Once again, the student-staff working relationships have matured swiftly to result in the completion of two further e-learning packages. On the basis of experience gained, groups will be limited to a maximum of two student partners per project in future years, since this seems to result in a better working dynamic than groups of three student partners.

We have been extremely fortunate that the students who have chosen this SSM to date have been exceptionally well motivated and engaged and respond well to the inclusive and welcoming behaviours of the staff involved. It is clear that the students who opt for this SSM greatly value the freedom and autonomy it provides within the setting of a clinical programme. The SSM is now a permanently embedded element of the curriculum and we look forward to continued success with this model of co-creating teaching materials for the BDS course. The success of the SSM is evidence that given the right circumstances, co-production partnerships have a place in professional degree programmes.

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REFERENCES

Bovill, C., Cook-Sather, A., & Felten, P. (2011). Students as co-creators of teaching approaches, course design, and curricula: Implications for academic developers. *International Journal for Academic Development, 16*(2), 133-145. https://doi.org/10.1080/1360144X.2011.568690

Bovill, C., Cook-Sather, A, Felten, P., Millard, L., & Moore-Cherry, N. (2016). Addressing potential challenges in co-creating learning and teaching: Overcoming resistance, navigating institutional norms and ensuring inclusivity in student-staff partnerships. *Higher Education*, *71*(2), 195-208. https://doi.org/10.1007/s10734-015-9896-4

Byrne, P. A., Lewis, S. E. M., & Thompson, L. W. (1999). Special study modules: A student's perspective. *Medical Teacher*, *21*(3), 299-301. https://doi.org/10.1080/01421599979572

Crothers, A., Bagg, J., McKerlie, R. (2017). The flipped classroom for pre-clinical dental skills teaching: A reflective commentary. *British Dental Journal*, *222,* 709-713. https://doi.org/10.1038/sj.bdj.2017.409

Curran, R., & Millard, L. (2016). A partnership approach to developing student capacity to engage and staff capacity to be engaging: Opportunities for academic developers. *International Journal for Academic Development*, *21*(1), 67-78. https://doi.org/10.1080/1360144X.2015.1120212

General Dental Council (2015). *Preparing for practice: Dental team learning outcomes for registration* (2015 revised edition)*.* Retrieved from www.gdc-uk.org

Healey, M., Flint, A., & Harrington, K. (2014). *Engagement through partnership: Students as partners in learning and teaching in higher education.* The Higher Education Academy. Retrieved from https://www.heacademy.ac.uk/system/files/resources/engagement_through_partnership.pdf

Jarvis, J., Dickerson, C., & Stockwell, L. (2013). Staff-student partnership in practice in higher education: The impact on learning and teaching. *Procedia – Social and Behavioural Sciences*, *90*, 220-225. https://doi.org/10.1016/j.sbspro.2013.07.085

Lam, P., Au Yeung, M., Cheung, E., & McNaught, C. (2009). Using the development of eLearning material as challenging and authentic learning experiences for students*. Same places, different spaces: Proceedings of ASCILITE Auckland 2009.* Retrieved from http://www.ascilite.org.au/conferences/auckland09/procs/lam.pdf

Marquis, E., Puri, V., Wan, S., Ahmad, A., Goff, L., Knorr, K., & Woo, J. (2016). Navigating the threshold of student-staff partnerships: A case study from an Ontario teaching and learning institute. *International Journal for Academic Development*, *21*(1), 4-15. https://doi.org/10.1080/1360144X.2015.1113538

McCulloch, A. (2009). The student as co-producer: Learning from public administration about the student-university relationship. *Studies in Higher Education*, *34*(2), 171-183. https://doi.org/10.1080/03075070802562857