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Original Article

Reducing the distance: providing challenging and engaging online postgraduate education in pain management

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Summary points

1. Health professionals need access to flexible, high-quality, advanced education in pain management.
2. There are multiple pedagogical distances to be negotiated in the delivery of effective postgraduate education.
3. A critical consideration in the design and delivery of effective online learning for postgraduate education in pain management is how to: actively engage students in the learning process; and encourage students to become lifelong learners.
4. Conceptual frameworks for encouraging student interaction online provide a useful tool in the design of postgraduate online learning activities.

Keywords

Postgraduate education, distance education, online learning, student engagement

The provision of flexible, high-quality, advanced education for healthcare professionals is an increasingly important consideration as widespread concern mounts about the extent of the problem of pain.^{1–3} The Declaration of Montreal in 2011, which stated that access to pain management is a fundamental human right, is a testament to this concern.⁴ Added to this is a recent survey that highlighted working healthcare professionals are lacking essential pain education, knowledge and skills.⁵ Helping to address this educational need is the growing number of fully online Master's programmes in pain management.

In traditional university settings, however, where the focus is primarily on the delivery of on-campus education, there are a number of pedagogical distances to negotiate in the provision of high-quality graduate online distance education.⁶ Some are focused on the student population itself and the desire for engaging yet challenging learning experiences. Others are more closely associated with pragmatic concerns such as programme management and delivery, course costs and faculty involvement. This paper reports on how

such pedagogical distances are being managed across two traditional universities (the University of Sydney, Australia, and the University of Edinburgh, UK), which have been working in partnership since 2005 to deliver an online Master's programme in pain management. Using this experience as a case study, this paper reviews how structured e-learning activities can be designed to provide students with a rich, engaging and connected online experience.

To set the scene, the paper briefly reviews the growth of e-learning and the establishment of the

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partnership between the Universities of Sydney and Edinburgh. Then, drawing on the literature, the processes involved in developing e-learning capacity and self-regulated learning skills, while fostering student interaction and building understanding of course content, are explored, and some key conceptual frameworks for fostering student engagement online are introduced. Drawing on this discussion, four structured online discussion tasks are outlined and the affordances of these activities in alleviating pedagogical distances are discussed: how they enable student engagement and connectivity, develop specific knowledge and generic skills, build appreciation of alternative professional perspectives, aid student retention and accommodate needs of busy professionals. The implications for curriculum design, the importance of encouraging self-regulated learning and the provision of adequate student engagement online provide the concluding comments.

The growth of e-learning

Within education, particularly at a tertiary level, there has been a rapid increase in the number of students that are completing all or part of their education by 'online distance learning'.^{7,8} The reasons for this growth are varied and complicated but contain elements of organisational structure and change, revenue generation, internationalisation and the increased and rapid access to knowledge.⁸⁻¹⁰ At the University of Edinburgh, as an example, there has been an increase of approximately 800% wholly online distance learning taught postgraduate programmes in less than 10 years. The University of Sydney has also experienced similar growth in its provision of online distance education at a graduate level. With the increase in the provision of online distance learning comes the navigation of new methods of teaching and learning as well as opportunities for increased international collaboration. Some of the key challenges encompass how to introduce and support students in the online learning environment, engage students in the learning process and encourage them to take responsibility for their learning.

Establishing the programme and the partnership with the University of Edinburgh

The Master's in pain management programme was established at the University of Sydney in 1996, originally as a campus-based programme for a multidisciplinary target audience. Within a few years of its initial launch, student demand for the programme, nationally and internationally, prompted its redevelopment into an

online format: making it one of the first programmes of its kind to be offered worldwide. This shift in the delivery mode has become an increasingly common approach to enable busy professionals access to advanced education, somewhat time and place independent.

Currently, the course is structured as a two-year Master's programme, with entry and exit options at postgraduate certificate and diploma levels. All students are required to complete the four core units that comprise the postgraduate certificate. These units provide the foundational core, covering the fundamental knowledge and skills required by any health professional working in, or with an interest in, pain management (Table 1). The International Association for the Study of Pain core curriculum,¹¹ as in other pain management Master's programmes, underpins the course design. Students studying beyond the postgraduate certificate level undertake electives, providing them with opportunities to deepen understanding in specific areas and tailor their learning to meet specific professional needs and interests.

In 2005 a partnership was forged with the University of Edinburgh, via a licence agreement, allowing access to the course materials developed by the University of Sydney. Since this time, the University of Edinburgh has been delivering the Master's programme within a defined geographical area (UK and European region) using its own infrastructure, administration and faculty. Effectively, this partnership has helped to improve the programme's market reach and affordability. With the involvement of the University of Edinburgh, there is a closer connection to the student market in this region, at a much more affordable rate. Although beyond the scope of the current paper, the potential for institutional collaboration across both programmes offers many exciting possibilities for greater student interaction and engagement internationally. However, pragmatic issues (such as differences in semester timeframes), and university boundaries (such as enrolment requirements and copyright provisions) must be overcome if these possibilities are to be fully realised.¹²

Student engagement and self-regulation

Key to successful use of any learning activity is the concept of student engagement and self-regulation. Early work on engagement and interactive online environments by Stoney and Oliver¹³ highlights that well-designed programmes led to increased learner engagement, as was exemplified by greater levels of higher-order thinking such as planning and strategy and predicting and imposing meaning. More recent work by Richardson and Newby¹⁴ also suggests that as students gain experience with online learning, they begin to take

Table 1. Units of study

Core courses	Elective courses
Introduction to Pain Management	Cancer Pain
Pain Mechanisms and Contributors	Musculoskeletal Pain
Principles of Pain Treatment and Management	Concepts of Pain
Pain Conditions	Independent Studies in Pain
	Pain in Children
	Pain in Older People
	Psychological Approaches in Pain Management
	Disability and Pain Rehabilitation
	Orofacial Pain
	Pharmacology of Pain
	Neurobiology of Pain
	Psychology of Pain

increased responsibility for their own learning, again having implications for the design, structure and facilitation of online courses.

Research studies have shown that learner engagement is a key factor in both learning success¹⁵ and student retention.^{16–18} A number of definitions of engagement have been proposed, ranging from that by Krause and Coates,¹⁹ who identify that student engagement is related to the participation in sound educational strategies that lead to measureable outcomes, through to the Higher Education Funding Council for England's²⁰ observation that 'engagement and the shaping of the learning experience is supported by institutions making deliberate attempts to involve and empower students'.

In this paper we explore student engagement in a broad sense, encompassing both the academic and non-academic components of the student experience. We view engagement as 'the mobilization of cognitive, affective and motivational strategies for interpretive transactions'²¹ that occur through interaction with others.¹⁶

Closely linked to this is the concept of self-regulation, which refers to a student who is regulating his or her own learning. Although there is variation in the specific theories of self-regulated learning, all focus on the central concept that cognitive, contextual and motivational factors influence the learning process and that self-regulated learners are able to set task-related goals, take responsibility for their own learning and maintain motivation through the use of various strategies.^{22–24}

Conceptual frameworks for designing effective e-learning

There are a number of conceptual frameworks that have been developed to guide thinking about, and

planning for, the provision of an effective and engaging student learning experience. From an e-learning perspective, three specific frameworks are often put forward as useful models: the five-stage model;^{25,26} the community of inquiry model;^{27,28} and Bloom's digital taxonomy.²⁹ Collectively, these models provide conceptual tools for progressively guiding the design of learning, from the introduction of students to the online environment through to the role of the teacher in this process and how this facilitates the development of students' technical competence and content expertise.

The community of inquiry model²⁷ provides a useful overarching framework. It suggests that deep and meaningful learning occurs within the online learning community through the interaction of three separate, yet interconnected, core elements:

- cognitive presence;
- social presence; and
- teaching presence.

Here, each of the elements needs to be progressively developed and revisited as a course of study evolves. That is, social presence is concerned with how to promote effective and open communication as well as group cohesion; cognitive presence is concerned with how to develop knowledge collaboratively and reflectively; and teaching presence is concerned with the role the teacher plays in facilitating these processes.²⁷

Similarly, Bloom's digital taxonomy²⁹ also provides a useful, and somewhat more pragmatic, framework. This taxonomy, which builds on Bloom's seminal work of the 1950s³⁰ and Bloom's revised taxonomy,^{31,32} maps the various forms of online activities and communication tools that can be used to develop student understanding and skills, alongside the learning outcomes across lower- and higher-order thinking skills.²⁹

Both Garisson et al.'s^{27,28} and Churches's²⁹ frameworks are useful for designing effective e-learning. Notwithstanding the merit of these two models, for the purpose of this paper, we have elected to use Salmon's²⁶ five-stage model primarily because it offers an extremely workable approach and focus for scaffolding online discussion activities. Importantly, it provides a framework for the development of content knowledge, while building technical competence as the level of interaction and task engagement increases. The stages of Salmon's model are:

1. access and motivation;
2. online socialisation;
3. information exchange;
4. knowledge construction; and
5. development.

Each stage of this model requires that participants master certain technical skills before proceeding to the next level of competence. With its dual emphasis on learning about and with technology, it provides a practical approach for developing online discussion activities while acknowledging the technical support and e-moderation requirements.

Engaging students via asynchronous discussion activities

With these theoretical frameworks in mind, in this section we outline four structured e-learning discussion activities. These activities are used as examples to illustrate the processes involved in the promotion of online socialisation, open communication and group cohesion, and the development of an understanding of, and skills in, multidisciplinary pain management practice. They also demonstrate how students are introduced to the online environment and then challenged to progressively take more responsibility for the learning process.

The use of discussion as a teaching strategy for facilitating learning has a longstanding history in university education.³³ Not surprisingly, given the continuing advances in information and communication technologies, the use of online discussion forums have now become common practice for facilitating interactions that support the shared construction of knowledge among participants of a learning community.¹⁷ Two distinct modes of text-based communication – synchronous (real time) and asynchronous (delayed time) – have emerged within e-learning environments. Results of investigations have shown little evidence for the superiority of one mode over another;³⁴ rather, they are used to facilitate different objectives and types of learning. In an online postgraduate pain education

context – with a multidisciplinary audience who are generally studying part time and juggling multiple, time-consuming demands – the use of asynchronous discussion forums is a particularly useful strategy for engaging students in the learning process. The asynchronicity provides opportunities for student participation at a time and place of their choosing. It also enables opportunities for more considered thought and reflection (something that is not always possible in a classroom environment, particularly for quieter students), and the active process of shared knowledge production.³⁵ Asynchronicity is also a key benefit when engaging in discussion across international time zones, where synchronicity would be realistically unmanageable by students.

Using Salmon's²⁶ five-stage model we now highlight how the four asynchronous online discussion activities outlined in this paper provide students with technical and motivational support, in addition to a structured and developmental approach to learning about pain.

First, it is important to identify that these discussion activities form an assessable component (20% of the total mark) that students must complete in order to pass a unit of study. While this clearly influences student motivation to participate, in our experience the majority of students are highly motivated to learn and keen to develop their understanding about pain management: some are already working in this specialty area, while others are interested in gaining employment in the field. Student engagement in each task is monitored and encouraged by the facilitator, and students are assessed according to the quality, quantity and relevance of their participation.

Another point of note is that each of these activities, which are constructively aligned with the content and objectives of the unit of study,³⁶ is structured over a 4- to 6-week timeframe, with the provision of student supports in the form of either online readings or activity instructions and guidelines. Typically, students complete each of the discussions progressively, moving through the four activities over a two-term timeframe. As the student completes each activity, the demands and complexity of the task increase in an attempt to encourage self-regulated learning. Importantly, the assessment of each task reflects this approach and students are progressively assessed on the development of content expertise and capacity to communicate and interact in an online format. Students are provided with specific assessment criteria for each online discussion and its associated tasks.

In the first term, the initial asynchronous discussion activity (in the Introduction to Pain Management unit) is divided into two tasks: in task 1, students consider various definitions of pain and discuss how these definitions fit within their own professional frames of

reference; in task 2, students review and reflect on the current debate on pain management and human rights. This focus reflects the introductory content of the unit and provides students with a relatively non-threatening activity that principally draws on their personal professional experience. In the next unit (Pain Mechanisms and Contributors), students complete a case study activity with a focus on the mechanisms and contributors of pain. As with the previous unit, this activity is directly aligned with the content and structure of the unit, providing a relatively non-threatening and authentic discussion task. A key point for facilitators of these asynchronous discussions is that learners, particularly in the early stages of their course of study, may lack the learning strategies to participate in such discussions and, as such, both of these activities are closely moderated, with a skilled online facilitator who ensures that students are actively participating, remaining on task and extending the discussion. This focus on the importance of skilled online facilitation, with the provision of guidance and feedback, was highlighted some years ago by Harasim et al.³⁷

In the second term the first discussion (in the unit Principles of Pain Treatment and Management) is an online debate activity in which students consider the statement 'Pain is merely a symptom, not a disease'. Allocated into one of two teams of between 6 and 12 participants (depending on student numbers), students collaborate in small groups to develop a position paper and a rebuttal either for or against this statement. At the end of the activity students are asked to submit a self-assessment in the form of a written reflection about the debate topic and their role in the process of group collaboration. Students often report (anecdotally and via the written reflection) that this is a challenging task.

The debate is followed by another group activity in the next unit of study (Pain Conditions). Using a role-play approach, this activity is designed as a round table discussion in which a multidisciplinary team is meeting to discuss a patient case. Once again, students are allocated into small groups (usually four participants per group) and are asked to assume a specific role (often outside their own professional background). From this alternative role position, students review the case and then present their position about the treatment and management requirements, and participate in a multidisciplinary team meeting to determine the appropriate course of action. At the end of the activity, students are asked to provide a written reflection that reviews the multidisciplinary team process and reconsiders the treatment and management of this pain condition from the perspective of a paediatric rather than an adult patient.

Although these discussion activities provide the main focus for the online interaction for each unit of

study, the facilitator's role extends beyond the provision of support and guidance in these tasks. They also play an important role in troubleshooting technical issues, particularly in the initial stages, and responding to questions about course content. Importantly, as students gain confidence in the e-learning environment and build their skills in online communication, the focus of the interaction is predominately student to student. Effectively, the facilitator's role progressively shifts from being 'a sage on the stage' and/or 'a guide on the side' to becoming 'a ghost in the wings'.^{38,39}

Table 2 maps the progressive development of knowledge and course content alongside e-learning skills and self-regulation as it relates to Salmon's five-stage model. We also briefly highlight the assessment requirements at each stage.

Each of the discussion activities outlined above has been designed to mimic the developmental approach advocated in the conceptual frameworks outlined previously.

Is good course design all that is needed?

In terms of designing and structuring a course curriculum, one cannot design activities without taking into consideration both the design of the specific online activities that structure learning and the online learning management 'tool' itself (e.g. Blackboard (www.blackboard.com); Moodle (<http://moodle.org>)). The question of whether the online learning management tool itself can address pedagogy is ongoing⁴⁰⁻⁴² and is outside the scope of the current paper; however, there are areas that are eligible for closer consideration by those designing and teaching online courses. Appropriate technical and student support and access to programme administrators all are important considerations.⁴³ Motivational factors, sharing of professional perspectives, appropriate levels of feedback and facilitator presence,⁴⁴ and the use of a clear theoretical framework can aid course design and encourage student engagement. Further, acknowledging the student cohort as busy professionals who are often time poor, asynchronous discussion activities provide a sound pedagogical approach for the development of advanced knowledge in pain management while fostering a learning community that encourages interaction and collaboration.

Conclusion

As has been demonstrated, clear conceptual frameworks (such as Salmon's five-stage model from 2004), can provide useful tools for scaffolding learning in key

Table 2. Application of Salmon's five-staged model

Course name	Stage in Salmon's model	Students' online activities	Role of facilitator/tutor
Orientation	Stage 1: Access and motivation	Logging in (simple, easy to navigate user interface, with print-based/phone support) Introductory readings Accessing first module Listening to students' experiences ('student voices') Completing simple tasks (e.g. uploading assignment cover sheet)	Welcomes students Provides practical support (technically, administratively, personally) Provides print-based/telephone support as required Provides interesting starting points
	Stage 2: Online socialisation	Getting to know the group (survey, posting introductions)	Encouragement and feedback from online moderator Encourages students to introduce themselves using 'ice-breaking' activities Explains 'netiquette'
Introduction to Pain Management	Stage 2: Online socialisation	Continue getting to know fellow students through introductions and sending and receiving messages	Introduces, comments and provides feedback on activity Welcomes latecomers and/or new team members Introduces any weekly content experts who may contribute to content
	Stage 3: Information Exchange	Discussion tasks that draw on personal student experiences Comparing and contrasting perspectives about definitions of pain Reviewing a current issue and considering its application Students are assessed on quality and level of participation in the discussion and use of theory and its relevance to the discussion	Facilitates structured discussion activities Encourages discussion Encourages students to post messages Summarises any findings and/or discussions Encourages quieter students
Pain Mechanisms and Contributors	Stage 3: Information exchange	Discussion task that involves reviewing a given case study Case study in multiple parts that builds on previous case material	Provides and facilitates the structured activity Encourages participation Encourages students to post messages Asks questions of the students
	Stage 4: Knowledge construction	Course content-related discussion Application of critical thinking to course content about pain mechanisms and contributors Students are assessed on quality and level of participation in the discussion and use of theory and its relevance to the discussion	Asks questions Encourages reflection Facilitates the process for students
Principles of Pain Treatment and Management	Stage 3: Information exchange	Discussion task that involves student collaboration in small teams to develop their understanding of their allocated position in the debate	Provides activity briefing and access to introductory supports Clarifies understanding of task Monitors and encourages student-to-student collaboration

Table 2. (Continued)

Course name	Stage in Salmon's model	Students' online activities	Role of facilitator/tutor
Pain Conditions	Stage 4: Knowledge construction	Students collaborate in small groups online to develop a position paper and a rebuttal to the statement 'Pain is merely a symptom, not a disease'	Facilitates the process of the discussion Asks questions Encourages reflection
	Stage 5: Development	At the end of the activity students are asked to submit a self-assessment/reflection about the debate topic and their role in the process of collaboration Assessment is based on participation (as previously) and the written reflection	Supports students Encourages reflection on the activity Tutor is less active and allows students to develop knowledge
	Stage 3: Information exchange	Discussion task that involves student collaboration in small teams to develop understanding of an alternative role perspective	Allocates students to groups Provides activity briefing and access to supports Clarifies understanding of task Monitors and encourages student to student collaboration
	Stage 4: Knowledge construction	Activity designed as a multidisciplinary team 'meeting'. Students are asked to assume a specific clinical role and to review the case; present their position about the treatment and management requirement; and determine an appropriate course of action	Monitors the process of the discussion Asks questions Encourages reflection
	Stage 5: Development	Students provide a written reflection (individually) that reviews the multidisciplinary team process and reconsiders the treatment and management of this pain condition from a paediatric context Assessment is based on participation (as previously) and the written reflection	Supports students Encourages reflection on the activity Tutor is less active and allows students to develop knowledge

areas of pain management education. They enable students access to a staged approach to their learning in which the acquisition of knowledge about the subject area is matched not only to the development of the students' technical skills, but also to the level of facilitator participation and input. With a skilled facilitator providing the support and encouragement that is needed, and the informed selection of suitable online learning management tools, students have the necessary supports they need to begin to engage in the process of learning. Add to this a clearly developed and logical curriculum that has been thoughtfully structured in line with a learning framework suitable for a digital environment, and the circumstances for student engagement are greatly enhanced.

So, too, is the opportunity for developing self-regulated learners who are motivated to actively gain a deeper understanding about multidisciplinary pain management practice.

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Multiple choice

1. Which of the following statements represents the sequence of Salmon's five-stage model of e-learning?

- (a) Access and motivation; online socialisation; knowledge construction; information exchange; development.
- (b) Access and motivation; online socialisation; information exchange; knowledge construction; development.
- (c) Access and motivation; information exchange; online socialisation; knowledge construction; development.

- (d) Access and motivation; online socialisation; information exchange; development; knowledge construction.

2. Which of the following statements is NOT an indicator of student engagement?

- (a) Active participation in learning activities.
- (b) Helpful and cooperative students.
- (c) Student-to-student as well as student-to-teacher interaction.
- (d) Willingness to participate in learning activities.
- (e) Desire to be successful and develop understanding.
- (f) Improved academic outcomes.

3. Which of the following terms can be used to describe the role of the teacher in an online environment?

- (a) E-moderator.
- (b) Online facilitator.
- (c) Guide on the side.
- (d) Ghost in the wings.
- (e) All of the above.

4. The common features of self-regulated learners are:

- (a) willingness to tackle challenging academic tasks.
- (b) ability to plan, monitor and evaluate learning.
- (c) motivation to learn and develop a deep understanding of content.
- (d) awareness of academic strengths and weaknesses.
- (e) all of the above.

5. Asynchronous discussion has which of the following advantages (select all that apply)?

- (a) It happens in real time.
- (b) It allows greater reflection from students.
- (c) It allows for instant replies to messages.
- (d) It provides opportunities for student participation at a time of their choosing.
- (e) It is useful for students studying in different time zones.

Answers

1b; 2b; 3e; 4e; 5b,d,e.