Motivating Undergraduate Students via Online Learning to Develop Clinical Competencies

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Abstract

Background: Online learning is becoming increasingly common for undergraduate health professions.

Aims: To examine the effect of an online hypertension management module in motivating undergraduate pharmacy students to further develop clinical competencies during future clinical placements.

Method: The module focuses on approaches to counselling techniques for chronic disease management. It is complemented by therapeutics lectures, counselling tutorial and an objective structured clinical examination. A student survey, constructed based on the Theory of Planned Behaviour, was undertaken after completion of the assessment.

Results: Sixty two percent reported increased motivation to practice what they had learnt during placements, and a majority also reported improved attitudes and perceived self-efficacy. Levels of motivation had significant moderate correlations with improved appreciation of counselling techniques (r=0.489, $p<0.001$), and confidence to further practice blood pressure counselling (r=0.411, $p<0.001$).

Conclusion: Increased motivation to manage hypertension during future placements appears correlated with perceived self-efficacy and engagement with the learning concepts.

Keywords: *Clinical competencies, motivation, online learning, pharmacy, undergraduates*

Introduction

Contemporary thinking around online learning is that a constructivist approach to module design can enhance development of competencies (Auyeung, 2004). This approach requires user engagement with complementary activities to allow reflection on ideas and collaborative problem-solving in an authentic and real-life context (Martens *et al*., 2007). Martens *et al*. (2007) suggests that the 'acid test' for successful constructivist design is whether or not learners become intrinsically motivated to further explore learning so that concepts and ideas are consolidated (Priest, 2000). For undergraduate health professionals, this motivation to continue exploring concepts should ideally extend throughout their degree. This includes during clinical placements, which are key drivers of skills consolidation and competency development for patient care (Henderson *et al*., 2007). However, consolidation may be hampered by student disengagement during university-based skills teaching, often linked to a perceived lack of authenticity (McBrien, 2006; Newton *et al*., 2009). Therefore, developing students' motivation with training that is perceived as relevant seems important to optimising learning during placement. Despite this, research efforts to promote such motivation overwhelmingly focus on interventions during

the placement period (Dornan *et al*., 2005; Bourgeois *et al*., 2011).

Limited evidence suggests that comprehensive face to face theoretical preparation for placements during the curriculum positively influences students' perceived clinical self-efficacy immediately after training, and further during placements (Henderson *et al*., 2007; Happell *et al*., 2008). Self-efficacy is a key component of internal student motivation and may encourage a deeper approach to learning (Prat-Sala & Redford, 2010). However, the capacity to integrate ten hours of extra face to face teaching into most health curricula, as was done for these studies, is limited. The use of online, self-directed learning (SDL) might represent a more feasible approach. In 2011, the STEP UP (Student Transition to Expert Practitioner during Undergraduate Placements, available at http://www.monash.edu.au/pharm/current/step-up/) online module was introduced one year in advance of clinical placements to second-year undergraduate pharmacy students at Monash University's Malaysian campus. This is an online module designed to promote basic competencies around patient behaviour change and counselling in chronic disease management (with a focus on blood pressure [BP] management). It

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was also designed to be a resource for students during placements.

General constructivist principles were incorporated throughout the STEP UP module. We wanted students to readily have access to the technical information they might need, without focusing delivery on communication of information. Instead the learning and assessment processes were built around creating opportunities to simulate and reflect on typical scenarios and construct personal meaning around the required knowledge and skills. While this approach to online learning is designed to motivate students to learn, its ability to instil motivation to explore concepts during future placements is unknown. Because this module was developed at an Australian Monash University campus, and with Australian clinical competencies and settings in mind, there was additional concern that this largely SDL might be insufficient to convey authenticity and instil motivation among Malaysian students. The aim of this paper is to explore the potential effect of an online module, developed in a constructivist manner, on intrinsic student motivation to further develop clinical competencies during future supervised placements.

Method

The STEP UP program

The STEP UP website was framed around a number of patient counselling videos that explored core behaviour change principles in pharmacy practice. It integrated opportunities for reflection and encouraged student to consider how they themselves should implement such principles. Instructional text was kept to a minimum, instead web-based hyperlinks were provided to a variety of practice resources so that students could explore further issues they saw as most important. Content was also designed to allow both completion from start to finish and easy access to individual sections and resources. Tutorials, undertaken one-two weeks prior to assessment, asked students to reflect individually on several clinical cases via pre-tutorial exercises. Then they construct a consensus within tutorial groups of the most appropriate approach to counselling and treatment. Each tutorial group examined different cases and then explored their consensus with the entire tutorial class.

Guidelines and blood pressure monitors were provided to the library for student loan, and there was an expressed expectation that students would use these to role-play scenarios with peers. No formal direction was given around 'how' to conduct peer interaction, only guidance that the experience should be used to prepare for Objective Structured Clinical Examinations (OSCEs). Students had complete independence to explore concepts, practice and reflect on personal learning needs with this process.

As assessment drives learning, student competency was determined principally via an open book online multiple choice questions (MCQs) quiz and OSCE. This implicitly drives individual student construction of a knowledge and skills base to enable professional service delivery, without extensive didactic communication by teaching staff. In preparation for these assessments, students were given sample quiz questions and provided details on preparation for the OSCE. In 2012, six extra videos of simulated OSCE were provided to students to demonstrate how competencies would be assessed. These videos featured two high-scoring, two medium-scoring, and two borderline-pass OSCE interviews. Each video was accompanied by a marked assessment grid with comments to identify what was done well, and areas for improvement.

Upon completion of these two assessments, a survey was conducted to explore student experiences with this module. The survey contained 14 multiple choice items – statements for which students' level of agreement was sought – and four open questions seeking general opinions on the module. Multiple choice responses conformed to a five-point Likert scale format and ranged from 'strongly agree' to 'strongly disagree'.

Most multiple choice items were formulated using the Theory of Planned Behaviour (TPB) as a framework (Ajzen, 1991). Originally developed to explain patient behaviours, it's value as a tool to explain health professional practice intentions is increasingly recognised (Kortteisto *et al.*, 2010). TPB suggests that motivation to implement a given behaviour is influenced by personal attitudes towards the behaviour, subjective norms, and perceived self-efficacy (Ajzen, 1991). Subjective norms refers to perceptions of social pressure to engage (or not) in a particular activity. Perceived self-efficacy refers to an individual's belief that they will be able to successfully undertake a given activity. The behavioural intention it was hoped this module would promote was motivation to practice their delivery of BP monitoring and counselling during future community pharmacy placements. This outcome was assessed as a single question. We explored if they were 'enthusiastic' about future counselling, to clearly focus on internal motivation. To ask if they were 'motivated' would have been more generic and encapsulate external motivating factors (*e.g.* perception it will help with grades) (Hartnett *et al.*, 2011). Survey items are listed in Table II.

Behavioural attitudes were assessed using three questions on key issues (A1–A3). These questions determined student appreciation of the beneficial role a pharmacist can play in hypertension control, perceived importance of tailoring hypertension management for individual patients, and appreciation of counselling techniques such as motivational interviewing.

The development of subjective norms around expected standards of practice was promoted by encouraging preparation for OSCE with peers. We measured this domain indirectly via two questions that asked their level of engagement with peers to practice BP measurement and BP counselling (SN1 and SN2).

Five questions were used to investigate perceived self-efficacy (SE1–SE5), owing to its multifaceted nature and its close relationship with expected graduate

competencies. Students were first asked generally about their perceived adequacy of knowledge in key areas (lifestyle, medicines use, and counselling techniques). Importantly, perceived self-efficacy refers not simply to a belief that they possess the skills for a given activity, but also that they will successfully implement that activity in practice if required. Hence, we asked not just about their perceptions of skills and knowledge, but, in a related manner, their confidence that they could apply what they have learnt into practice. We also asked about perceived usefulness of clinical guidelines to support their counselling.

It was considered logical that a successful constructivist design encouraging reflection, peer engagement, and collaborative problem-solving in an authentic context, would positively influence the three domains outlined above, and thereby promote increased motivation. Evaluation of the OSCE process (three questions, CA1–CA3), along with the measurement of peer engagement outlined above (SN1–SN2), enabled an assessment of the degree to which students engaged with the module's intended constructivist approach. This would provide further indication as to whether module design might be influencing student motivation. The survey was examined for face and content validity by several academics, and was initially trialed with pharmacy students on an Australian campus.

The survey was carried out in a scheduled class that aimed to provide feedback to students with regard to their performance in the OSCE. Students were briefed about the purpose of the survey and informed that their involvement was voluntary and anonymous. The questionnaires were given to students by a teaching staff member and were collected back before the session begins. The same mode of delivery and identical survey were done for two consecutive cohorts. All students from both cohorts participated in the survey. Data gathered consisted of 39 and 42 set of questionnaires in 2011 and 2012, respectively. Basic demographic data (not linked to survey data) was obtained from university administrative records for descriptive purposes. This study has been reviewed and approved by the Monash University Human Research Ethics Committee (CF12/2471 -2012001322).

Analysis

Likert responses to questions were assigned a score from 1 (strongly agree) to 5 (strongly disagree). To compare results between 2011 and 2012, differences in median scores were evaluated using Independent Samples Mann-Whitney tests. Bivariate correlations of Likert variable scores used Spearman's coefficient to test for significance. R-values of 0 – 0.2 were considered very weak; 0.2 – 0.4 weak; 0.4 – 0.7 moderate; 0.7– 0.9 very strong. Significant correlations with improved motivation to practice counselling during future placements are highlighted in the text. P-values of less than or equal to 0.05 were considered statistically significant. Analysis was performed using IBM SPSS Statistics 20.

For open-response questions, a semi-qualitative evaluation was done. Students were asked to identify: (1) what they liked most about the STEP UP module; (2) what they least liked; (3) what they felt could be improved upon; and (4) if there were any other comments they would like to share. Student responses to each question were categorised based on the nature of the comments, *i.e.* it carries the same meaning or indication. The category that has the highest number of responses represents majority of student views for that question.

Results

Demographic data

A total of 81 students (39 students in 2011 and 42 students in 2012) provided feedback on the STEP UP module through the semi-structured questionnaire. Students were predominantly female, almost entirely Malaysian, and the average age was 21 years (Table I). The proportion of males increased from 21% to 38% between 2011 and 2012.

Table I: Demographics of Pharmacy students who completed the survey in years 2011 (N = 42) and 2012 (N = 39)

Category	2011		2012	
	Mean	SD	Mean	SD
Age	20.91	1.44	20.91	0.93
Gender (%)	**2011**		**2012**	
Female	78.57		61.54	
Male	21.43		38.46	
International students (%)	2.38		2.56	

SD standard deviation

Evaluation of student responses to the survey

Responses to all multiple choice questions were majority positive (Table II). Almost all students strongly agreed or agreed that they had practiced BP monitoring with peers, while five out of every six students strongly agreed or agreed that they had practiced counselling with peers.

Overall, 62% agreed or strongly agreed that they were more motivated to practice counselling during future supervised placements. More than four out of every five students strongly agreed or agreed that they had greater appreciation of the pharmacist's role in managing hypertension and an improved understanding of how to approach hypertension management for different patients. Similarly, 80% of students strongly agreed or agreed that they had the confidence to measure BP during future clinical placements, compared with 58% who felt confident to practice BP counselling. The proportion indicating adequate knowledge of BP monitoring and counselling was notably higher than the respective proportions who expressed confidence to undertake these activities.

Table II: Degree of agreement of each individual item in the questionnaires

Domain	Item	Year	Agreement in percentage (number of responses)					P (diff)[a]
			Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	
Constructivist Approach	CA1. The objectives were clearly defined for each OSCE station	2011	12.82 (5)	76.92 (30)	7.69 (3)	2.56 (1)	0.00	<0.001
		2012	7.14 (3)	45.24 (19)	14.29 (6)	26.19 (11)	7.14 (3)	
Constructivist Approach	CA2. The scenarios presented for each OSCE station were a fair representation of challenges faced in practice.	2011	10.26 (4)	66.67 (26)	15.38 (6)	7.69 (3)	0.00	0.04
		2012	7.14 (3)	45.24 (19)	33.33 (14)	14.29 (6)	0.00	
Constructivist Approach	CA3. Use of the OSCE assessment method is significantly better than written assessment to help develop my competency for practice.	2011	28.21 (11)	48.72 (19)	15.38 (6)	7.79 (3)	0.00	0.79
		2012	21.43 (9)	57.14 (24)	16.67 (7)	4.76 (2)	0.00	
Social norms	SN1. I prepared for the OSCE by practising to take blood pressure with my peers.	2011	56.41 (22)	38.46 (15)	2.56 (1)	2.56 (1)	0.00	0.27
		2012	42.86 (18)	52.38 (22)	2.38 (1)	0.00	2.38 (1)	
Social norms	SN2. I have practiced counseling with my peers.	2011	35.90 (14)	41.03 (16)	15.38 (6)	7.69 (3)	0.00	0.84
		2012	28.57 (12)	59.52 (25)	11.90 (5)	0.00	0.00	
Attitude	A1. I have greater understanding of the roles of community pharmacists in managing hypertension.	2011	17.95 (7)	69.23 (27)	12.82 (5)	0.00	0.00	0.63
		2012	14.29 (6)	71.43 (30)	9.52 (4)	4.76 (2)	0.00	
Attitude	A2. I have greater understanding of the principles of blood pressure management and how different patients should be managed differently.	2011	10.26 (4)	76.92 (30)	10.26 (4)	2.56 (1)	0.00	0.80
		2012	14.29 (6)	66.67 (28)	11.90 (5)	4.76 (2)	2.38 (1)	
Attitude	A3. I have a better appreciation of the counseling techniques that should be employed to facilitate patients to change their health behaviours.	2011	17.95 (7)	66.67 (26)	15.38 (6)	0.00	0.00	0.04
		2012	7.14 (3)	61.90 (26)	26.19 (11)	4.76 (2)	0.00	
Self-efficacy	SE1. The 'Guide to Hypertension Management' provided during the OSCE was useful.	2011	28.21 (11)	51.28 (20)	7.69 (3)	7.69 (3)	5.13 (2)	0.06
		2012	19.05 (8)	35.71 (15)	21.43 (9)	19.05 (8)	4.76 (2)	
Self-efficacy	SE2. I know enough about blood pressure management to deliver basic lifestyle advice to patients.	2011	20.51 (8)	71.79 (28)	5.13 (2)	2.56 (1)	0.00	1.00
		2012	23.81 (10)	64.29 (27)	11.90 (5)	0.00	0.00	
Self-efficacy	SE3. I know enough about blood pressure management to deliver basic advice about medicines use.	2011	5.13 (2)	76.92 (30)	17.95 (7)	0.00	0.00	0.04
		2012	9.52 (4)	47.62 (20)	28.57 (12)	11.90 (5)	2.38 (1)	
Self-efficacy	SE4. I am confident enough to practice blood pressure counseling during my future supervised placements.	2011	7.69 (3)	69.23 (27)	20.51 (8)	2.56 (1)	0.00	0.001
		2012	4.76 (2)	35.71 (15)	35.71 (15)	21.43 (9)	2.38 (1)	
Self-efficacy	SE5. I am confident enough to practice blood pressure monitoring during my future supervised placements.	2011	12.82 (5)	74.36 (29)	12.82 (5)	0.00	0.00	0.16
		2012	9.52 (4)	64.29 (27)	23.81 (10)	2.38 (1)	0.00	
Motivational Outcome	I am more enthusiastic about practising patient counseling during future supervised placements.	2011	7.69 (3)	64.10 (25)	23.08 (9)	5.13 (2)	0.00	0.26
		2012	11.90 (5)	40.48 (17)	45.24 (19)	2.38 (1)	0.00	

[a] Responses were assigned as score from 1 (strongly agree) to 5 (strongly disagree), and differences in median scores between 2011 and 2012 were compared using Independent Samples Mann-Whitney tests.

Correlations between different responses are shown in Table III. Levels of motivation to practice counselling during future placements had significant, moderate correlations with both improved appreciation of counselling techniques (r=0.489, *p*<0.001), and confidence to further practice BP counselling during future clinical placements (r=0.411, *p*<0.001). Significant but weak positive correlations with improved motivation were found for higher level of agreement in terms of reported understanding of BP management principles for different patients (r=0.388, *p*<0.001), preference for OSCE over written assessment (r=0.344, *p*=0.002), adequacy of knowledge to counsel on medicines use (r=0.312, p=0.005), greater understanding of the pharmacist's role (r=0.290, *p*=0.009), and a belief that OSCE scenarios were a fair representation of practice (r=0.267, *p*=0.016). There was no indication that engagement in practice with peers was associated with increased enthusiasm for the activity.

Student comments

Most positive comments largely reflected on the usefulness of the module for guiding future practice, and the clarity of presentation. One-third of the 64 respondents commended that the embedded videos are very useful resources to learn about counselling skills and professional expectations, and the information available on the website was comprehensive and helpful. Terms such as 'practical' and 'hands-on' were regularly used, as was the impact on their understanding of how to adapt counselling for behavioural change with different patients. Six respondents indicated the usefulness of guidelines. When asked what was least liked about the STEP UP module, comments given related almost entirely to assessment. From the 56 students who provided feedback, 22 of them expressed dissatisfaction over the lack of guidance on patient counselling and practice for OSCE preparation, while 13 students felt that the time limit for counselling during OSCE should be longer. Consistent with their feedback, as suggestion to further improve student experience with this process, 24 students requested for more guidance and details about the OSCE, and a preference for extra face to face tutorial sessions. A number of students highlighted the stress associated with the OSCE assessment format, the difficulty experienced in performing under pressure and in the time allowed. When asked for additional comment, although only 22 students responded to the question, 50% of students thought the module provided good experience, was useful and stimulating. A small number of students suggested that OSCE scenarios might be more complex than real-life scenarios.

Discussion

Results indicate that the STEP UP module facilitated motivation to develop competency during placements. If the 'acid test' for successful constructivist design is the development of student motivation to further explore

Table III: Selected correlations that were present between specific questions in the survey. Each question reflects a specific behavioral response from students to the online module. Behavioral response was categorized into three categories: self-efficacy (SE), subjective norms (SN) and attitude (A)[a]

Category	SE1	SE2	SN1	SE3	SN2	SE4	A1	A2	SE5	SE6	SE7	SE8	SE9	A3
SN1	-.020	-.109	1.000	.104	.629**	.070	.157	.088	.238*	.170	.195	.236*	.189	.179
	.859	.334		.355	.000	.536	.161	.432	.032	.129	.081	.034	.090	.110
SN2	.000	-.133	.629**	.129	1.000	.106	.289**	.192	.046	.215	.199	.085	.110	.148
	.997	.236	.000	.252		.348	.009	.086	.685	.053	.075	.452	.329	.188
SE4	.148	.284*	.070	.371**	.106	1.000	.490**	.427**	.311**	.180	.400**	.254*	.111	.344**
	.187	.010	.536	.001	.348		.000	.000	.005	.108	.000	.022	.323	.002
A1	.260*	.155	.157	.233*	.289**	.490**	1.000	.646**	.234*	.232*	.360**	.246*	.159	.290**
	.019	.168	.161	.036	.009	.000		.000	.035	.037	.001	.027	.156	.009
A2	.234*	.169	.088	.249*	.192	.427**	.646**	1.000	.398**	.363**	.481**	.247*	.227*	.388**
	.036	.131	.432	.025	.086	.000	.000		.000	.001	.000	.026	.041	.000
SE5	.031	.038	.238*	.144	.046	.311**	.234*	.398**	1.000	.318**	.310**	.321**	.298**	.193
	.786	.739	.032	.200	.685	.005	.035	.000		.004	.005	.004	.007	.084
SE7	.203	.207	.195	.248*	.199	.400**	.360**	.481**	.310**	.452**	1.000	.443**	.206	.489**
	.069	.064	.081	.025	.075	.000	.001	.000	.005	.000		.000	.066	.000
SE8	.130	.373**	.236*	.309**	.085	.254*	.246*	.247*	.321**	.470**	.443**	1.000	.354**	.411**
	.246	.001	.034	.005	.452	.022	.027	.026	.004	.000	.000		.001	.000
SE9	.126	.215	.189	.127	.110	.111	.159	.227*	.298**	.233*	.206	.354**	1.000	.110
	.263	.053	.090	.257	.329	.323	.156	.041	.007	.036	.066	.001		.329
A3	.057	.267*	.179	.059	.148	.344**	.290**	.388**	.193	.312**	.489**	.411**	.110	1.000
	.615	.016	.110	.604	.188	.002	.009	.000	.084	.005	.000	.000	.329	

[a] Data are correlation coefficient and significant level of each correlation, measured collectively for both cohorts of students (N = 81).

[b] ** Correlation is significant at the 0.01 level (2-tailed).* Correlation is significant at the 0.05 level (2-tailed).

[c] Spearman's Rho

learning so that concepts and ideas are consolidated (Martens *et al.*, 2007), we can reasonably claim that the STEP UP module appears successful in this regard for most students. Importantly, it suggests that content designed with an Australian context in mind did have a motivational effect for Malaysian students. Following training, most students also perceived themselves to have adequate knowledge and confidence to manage hypertension.

More generally, the results of this analysis are consistent with other work suggesting that TPB, increasingly used to explain behavioural motivation among health professionals, might be applicable to undergraduate health profession students (Terry & O'Leary, 1995). By inference, it also supports the argument that motivation can be positively influenced with purpose-built online modules (Rovai *et al.*, 2007). Appreciation of counselling techniques and confidence to further practice BP counselling following training, indicators of positive attitude and improved self-efficacy, respectively, were clearly correlated with motivation to further practice. This aligns with previous work identifying a positive correlation between increasing self-efficacy for academic (reading and writing) tasks with more intrinsic motivation and a deeper approach to learning (Prat-Sala & Redford, 2010). Our study further explores this concept by suggesting a relationship between clinical self-efficacy and motivation to further practice under clinical supervision. Large majorities of students responded that these attributes had been positively influenced by undertaking the STEP UP module. Student comments suggest that the applied nature of content, embracing guidelines for practice and embedded counselling videos, were critical factors to success in these areas.

Most previous research examining best practice for online learning has focused on its ability to motivate learning, student satisfaction with online courses, and efficacy with respect to grades (Chen & Jang, 2010). Indeed, it is well-established that student motivation to learn drives learning success (Harnett *et al.*, 2011; Rovai *et al.*, 2007). Our research adds to this by suggesting that online learning might facilitate internal motivation to further develop clinical competencies above and beyond the immediate assessment requirements.

Self-regulation is also an important concept in student motivation - students are more effective when they take a purposeful role in their own learning (Wolters, 2003). Online learning modules can promote self-regulated learning (SRL) by providing clear orientation to the content, opportunities for support, and enabling students to self-direct learning at their own pace (Jeske *et al.*, 2014). SRL is therefore consistent with constructivist approaches in that students are considered to actively participate in the learning process, and given opportunities to reflect on what they have learnt (Pintrich, 2004). In this sense, our constructivist approach to design created a module with SRL. While we measured motivational components as outcomes, we did not measure the success of SRL-related components to mediate these effects.

Several other factors relating to positive attitude and self-efficacy had significant, but less pronounced levels of positive correlation with motivation. This is in keeping with TPB. However, no relationship was evident between peer engagement and student motivation. This merits further exploration, as it runs counter to the principles of both constructive alignment, and previous research on student motivation (Lee *et al.*, 2011). Potentially, the fact that almost all students engaged in peer learning for this module has made estimation of its effect unfeasible. Other possible explanations are that the influence of peers might be bidirectional, making any impact more difficult to detect. Our survey only measured the level of engagement and not the direction of engagement.

Reviews of online learning suggest that it is comparable with or slightly superior to face to face learning (Means *et al.*, 2010) in terms of assessment results. However, this statement hides considerably varying results between studies. This highlights the need to adequately describe the content and format of online learning being researched – the fact that learning is online is just one attribute of that teaching. It is noticeable that confidence around topics both largely learnt via STEP UP – monitoring BP and lifestyle counselling – remained high and was largely unchanged between cohorts. Conversely, perceived therapeutics knowledge declined in 2012, as did perceptions of ostensibly quite fixed attributes such as the usefulness of clinical guidelines, or representativeness of OSCE scenarios to practice. It would appear that factors unrelated to the module may have influenced responses.

Previous research suggests persistent student desires for interaction with teachers when learning online, and that overall student satisfaction and perceived learning is significantly related to their perceived support during online courses (Lee *et al.*, 2011). Our results suggest that it might also influence motivation towards future development of skills. Facilitating student motivation is a core component of effective teaching and needs to be maintained (Hartnett *et al.*, 2011; Young, 2006). Research into online discussion groups indicates that interaction with academics carries far greater weight than peer interactions (Swan, 2001; Wu & Hiltz, 2004; Garrison & Cleveland-Innes, 2005). Further work is required to determine how to strike a balance between real and perceived needs for academic support of online modules, and how this is influenced by the wider context of learning.

Limitations

A prospective cohort study of how this module influenced long-term motivation and actual uptake of BP counselling and monitoring during supervised placements, would be a more meaningful outcome. Such a study should also examine actual performance during clinical placements. We have established an immediate motivation, but this study does not establish if the motivation is sustained to the point of undertaking clinical placements, or the impact of increased motivation on translation to improved

competency. The cross-sectional nature of this study does not objectively measure a change in motivation, only student perceptions of change. However, we believed that most respondents would not have felt capable of meaningful reflection on most questions prior to undertaking the module, due to a lack of knowledge about concepts discussed. Equally, as a new area of course content, there was no equivalent didactic module, or historical cohort against which we could compare the module's efficacy.

Additional assumptions of SRL, that are perhaps less tied to a constructivist design, include that the student is trying to accomplish some goal, and that the student can monitor and control their own performance, motivation and cognition (even if they do not; (Pintrich, 1995)). While we established that course objectives were clear to them, we did not establish that accomplishing these objectives was their primary goal. For example, some students may have prioritised technical or knowledge aspects instead of overall competency. Also, while students had the ability to drive their learning for considerable aspects of the module, we did not measure their actual competency to do so or how it might have influenced self-efficacy and motivation.

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Conflicts of interest

There were no conflicts of interest.

References

Ajzen, I. (1991) The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* **50**, 179-211.

Auyeung, L.H. (2004) Building a collaborative online learning community: a case study in Hong Kong. *Journal of Educational Computing Research*, **31**, 119–136.

Bourgeois, S., Drayton, N. & Brown, A-M. (2011) An innovative model of supportive clinical teaching and learning for undergraduate nursing students: The cluster model. *Nurse Education in Practice*, **11**, 114-118.

Chen, K. & Jang, S. (2010) Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior*, **26**, 741-752.

Dornan, T., Hadfield, J., Brown, M., Boshuizen, H. & Scherpbier, A. (2005) How can medical students learn in a self-directed way in the clinical environment? Design-based research. *Medical Education*, **39**, 356-364.

Garrison, D.R. & Cleveland-Innes, M. (2005) Facilitating Cognitive Presence in Online Learning: Interaction Is Not Enough. *American Journal of Distance Education*, **19**, 133-148.

Happell, B., Robins, A. & Gough, K. (2008) Developing more positive attitudes towards mental health nursing in undergraduate students: part 2-the impact of theory and clinical experience. *Journal of Psychiatric and Mental Health Nursing*, **15**, 527-536.

Hartnett, M., St. George, A. & Dron, J. (2011) Examining motivation in online distance learning environments: Complex, multifaceted and situation-dependent. *International Review of Research in Open and Distance Learning*, **12**, 20-38.

Jeske, D., J. Backhaus, Stamov Roβnagel C. (2014). "Self-regulation during e-learning: using behavioural evidence from navigation log files". *Journal of Computer Assisted Learning,* **30**(3), 272-284.

Henderson, S., Happell, B. & Martin, T. (2007) Impact of theory and clinical placement on undergraduate students' mental health nursing knowledge, skills, and attitudes. International *Journal of Mental Health Nursing*, **16**, 116-125.

Kortteisto, T., Kaila, M., Komulainen, J., Mantyranta, T. & Rissanen, P. (2010) Healthcare professionals' intentions to use clinical guidelines: a survey using the theory of planned behaviour. *Implementation Science*, **5**, 51.

Lee, S.J., Srinivasan, S., Trail, T., Lewis, D. & Lopez, S. (2011) Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *The Internet and Higher Education*, **14**, 158-163.

Martens, R., Bastiaens, T. & Kirschner, P.A. (2007) New Learning Design in Distance Education: The impact on student perception and motivation. *Distance Education*, **28**, 81-93.

McBrien, B. (2006) Clinical teaching and support for learners in the practice environment. *British Journal of Nursing*, **15**, 672–674.

Means, B., Toyama, Y., Murphy, R., Bakia, M. & Jones, K. (2010) *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. Washington, DC: Technical Report. U.S. Department of Education.

Newton, J.M., Billett, S., Jolly, B. & Ockerby, C.M. (2009) Lost in translation: barriers to learning in health professional clinical education. *Learning in Health and Social Care*, **8**, 315-327.

Pintrich, P.R. (1995). Understanding self-regulated learning. *New Directions for Teaching and Learning,* **63**, 3-12.

Pintrich, P. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review,* **16**(4), 385-407.

Prat-Sala, M. & Redford, P. (2010) The interplay between motivation, self-efficacy, and approaches to studying. *British Journal of Educational Psychology*, **80**, 283-305.

Priest, L. (2000) The story of one learner: a student's perspective on online teaching. In *The online teaching guide: a handbook of attitudes, strategies, and techniques*

for the virtual classroom (eds. K.W. White & B.H. Weight), Allyn and Bacon, Boston, MA., pp. 37-44.

Rovai, A., Ponton, M., Wighting, M. & Baker, J. (2007) A comparative analysis of student motivation in traditional classroom and e-learning courses. *International Journal on E-learning,* **6**, 413-432.

Swan, K. (2001) Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education*, **22**, 306-331.

Terry, D.J. & O'Leary, J.E. (1995) The theory of planned behaviour: The effects of perceived behavioural control and self-efficacy. *British Journal of Social Psychology,* **34**, 199-220.

Wu, D. & Hiltz, S.R. (2004) Predicting learning from asynchronous online discussions. *The Journal of Asynchronous Learning Networks*, **8**, 139–152.

Wolters, C.A. (2003). Regulation of motivation: evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologis*t, **38**(4), 189-205.

Young, S. (2006) Student Views of Effective Online Teaching in Higher Education. *American Journal of Distance Education*, **20**, 65-77.