



Original Article

First-year osteopathic students' use and perceptions of complementary video-based learning

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ABSTRACT

Objectives: To examine first year osteopathic students' use and perceptions of complementary video-based learning in an osteopathic examination and management unit.

Design: Mixed-method sequential explanatory design.

Setting: Tertiary education facility Melbourne, Victoria, Australia.

Participants: First year osteopathy students.

Main outcome measures: Questionnaire-based surveys and focus groups were used to examine use of video resources and student perceptions. Surveys were analysed based on the frequency of responses made on a 4-point scale. Thematic analysis was performed on long-answer survey and focus group transcripts.

Results: Seventy-four ($n = 74$) students completed the surveys and 12 students took part in the focus groups. Participants reported the online videos had a positive effect on their learning experience in the unit (100%). Themes that emerged from the focus groups included improved understanding, increased exam study and performance, increased exam confidence, decreased exam anxiety, and minor technical difficulties.

Conclusion: Video-based learning appears to be an effective approach in decreasing first year osteopathy students' perceived exam anxiety, and increasing perceived exam confidence and performance. These perceptions are thought to be due to the adoption of a structured learning approach and the reduction in surface learning.

Introduction

Most current tertiary students are seen as 'digital natives' [1,2]. This term implies that, unlike any other previous generation of tertiary students, the current generation have spent their entire life surrounded by computers, mobile phones, video games and other technological devices [1]. Higher education curriculum designers should make the most of the 'web 2.0 tools' that are now accessible because of their adaptability, accessibility, and varied content [3] through blended learning. A major challenge for modern tertiary education institutions is how to best design and integrate the e-learning environments and 'web 2.0' learning tools from which this digital generation of students are learning [3]. Higher education curriculum designers should make the most of these 'web 2.0 tools' that are now accessible because of their adaptability, accessibility, and varied content [3,4].

Most tertiary institutions are implementing modern digital learning approaches in the form of blended learning. Blended learning is a way of improving student experiences and outcomes by combining the use of information and communicative technologies, and the effective parts of face-to-face communication [5]. Blended learning is said to be an essential component of modern teaching and learning because it is

easily accessible, attractive and engaging, makes collaboration easier and assists students and teachers to be life-long learners [6].

Video-based learning (VBL) is a popular form of blended learning [7–10]. Research evaluating the effectiveness of VBL in tertiary health and medical teaching settings suggests that it can have a positive effect on student learning – specifically on their preparedness, self-efficacy, enjoyment and overall understanding [8,11–13]. Furthermore, VBL appears to improve student engagement with the curriculum and discussion of content [3], and also encourages and fosters active and deep learning, especially when it comes to problem solving [13–15].

First year students face many challenges when assimilating into the higher education system. Pre-test anxiety can be one of these challenges. Generally, the cognitive component of pre-test anxiety is the factor most closely related to declines in academic performance [16]. Thoughts commonly exhibited by individuals dealing with high levels of cognitive test anxiety can include: comparing self-performance to peers, considering the consequences of failure, low levels of confidence in performance, excessive worry over evaluation, feeling unprepared for tests, and a loss of self-worth [16]. Fear of failure in particular, has been implicated with a surface learning approach [17]. The negatives associated with a surface approach to learning can be offset by

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Likert and open-ended question survey

First-year osteopathic students' use and perceptions of online video-based learning

This survey has been designed to assess your use and perceptions of the online practical technique video demonstrations available on VU Collaborate for Osteopathic Science 1 & 2.

How old are you? _____

Gender: ☐ Male ☐ Female

Year of Year-12 Completion:

Can you please list any post year-12 study you have undertaken (both completed and uncompleted):

How many times would you say you have accessed the online videos this year?

I use the online videos...

To review techniques before class	☐ Never ☐ Sometimes ☐ Often ☐ Very often
To review techniques after class	☐ Never ☐ Sometimes ☐ Often ☐ Very often
To revise for exams	☐ Never ☐ Sometimes ☐ Often ☐ Very often
To review difficult techniques	☐ Never ☐ Sometimes ☐ Often ☐ Very often
To learn techniques that I could not practice in class	☐ Never ☐ Sometimes ☐ Often ☐ Very often

The online videos...

Are easy to locate	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Are easy to play	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Are of good viewing quality	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Help me review material from class	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Help me prepare for exams	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Allow me to learn independently	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Motivate me to study	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Reduce the need to take notes	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Improved my exam performance	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Reduced my anxiety before the exam	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Improved my confidence for the exam	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Should be used in my other subjects	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree
Have improved my learning experience in this unit	☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly agree

Fig. 1. Likert and open-ended question survey.

promoting a structured learning approach [17] or a deep and active approach [14,15]. Furthermore, practical exams can add an additional layer of anxiety [18] because of their unpredictability and unique examiner-student interaction. This creates a challenge for first year osteopathy students, given the substantial practical and 'hands-on' component in the first year of a teaching program. Theoretically, blended

learning approaches should create an environment where students exhibit decreased exam anxiety, and increased confidence undertaking an exam, due to its ability to help students learn in a deeper and more active way. However, no known empirical literature to date demonstrates this effect.

Despite current tertiary students being thought of as 'digital

Open-Ended Section

- If you need more room for your responses please use the page over and indicate what question are answering.

1. How did the online videos influence your study during the semester?

2. What effect did the online videos have on your exam study and performance?

3. What impact did the online videos have on your anxiety and confidence levels for the practical exam?

4. How easy were the online videos to find and play?

5. In what ways would you suggest that the online videos could be improved?

Thank you for completing this questionnaire.

Fig. 1. (continued)

natives', this term does not necessarily indicate they are willing, or able, to use digital technologies such as VBL [19]. Most tertiary students have access to basic information technology (computers, mobiles, etc.), but an individual student's use of these for learning purposes is highly varied [19]. There is also evidence to show that there is an emerging 'digital divide' between tertiary students of different demographics [20]. In this context, the 'digital divide' refers to the potential social

inequality between those who have enhanced digital access and literacy and those who do not [20]. Therefore, we cannot assume that all tertiary students are able to make the use of modern blended learning tools [20]. Some students also feel that the information technology used in their teaching and learning activities is inadequate [21]. This highlights the need for targeted evaluation of blended learning approaches (including VBL) to ensure the students are both capable and willing to use



Research Project: 'First-Year Osteopathic Students use and perceptions of online video-based learning.'

Focus Group Questions

1. When were you most likely to view the online videos?
2. What did you like best about the online videos?
3. How did the online videos influence your study during the semester?
4. What effect did the online videos have on your exam study?
5. What Influence did the online videos have on your exam performance?
6. What Impact did the online videos have on your anxiety levels for the exam?
7. What Impact did the online videos have on your confidence for the exam?
8. How easy were the online videos to find and play?
9. What were (if any) you reasons for not watching the online videos?
10. What ways would you suggest that the online videos could be improved?
11. Overall, what effects have the online videos have had on your learning experience in this unit?

Fig. 2. Focus group questions.

the new technology, and if they are having positive effects on student learning.

Currently, there is only a small amount of literature pertaining to the use and effectiveness of VBL in the teaching of practical and psychomotor skills in health science education [10,15,22–24]. The present study is designed to evaluate the student usage of VBL, and their perceptions of VBL on their learning approaches and assessment performance in an osteopathic teaching program. This information can act to further inform and shape future pedagogical approaches [25,26].

Method

Ethical approval to conduct the study was obtained from the VU Human Research Ethics Committee (Approval Number: HRE 15-186).

Participants and setting

First year osteopathy students enrolled in the Osteopathic Science 1 and 2 (n = 114) in the Bachelor of Science program at Victoria University (Melbourne, Australia) were invited to participate in the survey and focus groups. The students had access to complementary

VBL material through the university learning management system (LMS). The LMS is an online system that allows students to access all the available content for their units, including resources such as lecture recordings, lecture materials and videos. The Osteopathic Science 1 and 2 units are predominately practical, where students are taught musculoskeletal examination and manual therapy skills, including articulation and soft tissue techniques for the spine and extremities. The unit is designed around students having 5-h of face-to-face practical skill sessions each week, over a 12-week semester. Students are expected to review the supplementary material on the LMS (including the VBL content) equivalent to 50–100% of their face-to face contact hours.

There were a total of 135 videos available to the students throughout the two semesters. The videos ran for 2–3 min each and demonstrated a single or group of assessment or examination techniques for a specific area of the body e.g. orthopedic tests of the shoulder. The unit coordinators both demonstrated and filmed the technique videos in a medium shot frame. They were filmed in the clinical setting, with a senior student as the model. The videos were narrated either during filming or dubbed post-production.

The students were informed of the present study through an information session at the beginning of the unit, including the fact that

the researcher was one of their educators. They were also provided with an information to participants form and paper version of the questionnaire. Students who wished to participate in the study could complete the consent form and questionnaire at a time of their choosing and return it to a drop-box. Responses to the questionnaire were anonymous. Students who were interested in participating in the focus groups were asked to contact the researcher via email. Consent for the focus groups was gained via a separate section on the questionnaire consent form.

Evaluation

A three-part mixed-method sequential explanatory design was used. Part one involved retrieving student video access data from the LMS. It was discovered that the LMS was inaccurate when describing total views, so percentage of total videos viewed was the only variable reported. Access data from the LMS was extracted by the author and data were anonymous. Part two was a questionnaire that evaluated the students' usage and perceptions of the VBL resources for the subjects (Fig. 1). The survey consisted of demographic questions including age, gender, previous studies and year of secondary education completion. All items on the questionnaire were developed from analogous research in medical education [12,13]. Students rated each item on a 4-point scale ranging from *strongly disagree* to *strongly agree*. The questionnaire also contained five open-ended questions exploring similar themes to the items. These additional questions were designed to increase the volume of qualitative data, and provide the students not participating in the focus groups with an opportunity to comment on the VBL resources. Part three involved a focus group. The focus group interview was conducted by the study author and guided by a set of questions (Fig. 2) that were developed from analogous research in medical education [12,13]. These questions were largely an extension of the questionnaire as to enrich the data received from the entire study.

Data analysis

Quantitative data was entered into Microsoft Excel for analysis, and descriptive statistics were generated for each questionnaire item. Questionnaire responses were categorised as positive (often, very often, agree, strongly agree) and negative responses (never, sometimes, disagree, strongly disagree). Focus groups were recorded on an electronic recording device then transcribed and manually analysed, along with the long-answer survey questions. The researcher identified the total number of common and emerging themes using methods from previous research [27]. To negate the potential for bias the researcher asked two colleagues to analyse the qualitative data individually. The researcher and colleagues then came to a group consensus on which themes were most evident.

Results

Student demographic

One-hundred-and-fourteen (N = 114) students were enrolled in the Osteopathic Science 1 and 2 units and had access to the online videos through the LMS. Seventy-four (n = 74) students (40 M, 34 F) completed the survey, representing a 65% response rate. Twelve (n = 12) students (7 M, 5 F) took part in the focus groups (11%). The mean was age 21.2 years old. Thirty-nine participants had completed other post-Year 12 study, while 35 had not.

Video access and usage in the learning management system

In semester one, students accessed an average of 74.7% of the total available videos (59 available). In semester two, students accessed an average of 76.3% of the total available videos (76 available). Students

on average accessed the video collection a total of 21 times throughout the year.

Survey – Section 1 use of online videos (Table 1)

Students appeared to access the online videos the most when preparing for exams and to review difficult techniques. Conversely, students were less likely to use the videos before class and after class. Students differed on whether they used the videos to learn techniques they could not practice in class.

Survey – Section 2: perception of online videos (Table 2)

Most students appeared to find the online videos easy to locate, easy to play and of good viewing quality. The students reported the online videos strongly helped them review material from class, prepare for exams and learn independently. Students also found the online videos beneficial to their study motivation, and reduced the need to take notes during class time. The students appeared to find the online videos very beneficial for their practical exam performance, for reducing their pre-exam anxiety and for their exam confidence. Students also thought that online videos should be used in their other subjects. The students were unanimous in their response that the online videos improved their learning experience in the unit.

Focus group and long-answer survey question findings

The focus group interviews were split into two main themes: positive and negative. Within the two main themes, multiple sub-themes were identified: *Positive* – (1) Good viewing quality; (2) Improved understanding; (3) Increased exam study and performance; (4) Increased exam confidence; (5) Decreased exam anxiety; (6) Good accessibility; and *Negative* – (7) Decreased use during semester and (8) Minor technical difficulties (Fig. 3).

A content analysis of the themes and subthemes was then conducted (Table 3). The majority of responses were positive impressions of the online videos, whilst negative impressions totalled 14% of the coded responses. Of the positive sub-themes, improved understanding and good accessibility were the most common responses, followed by increased exam study and performance, increased exam confidence, decreased exam anxiety and good viewing quality. Of the negative sub-themes, minor technical difficulties ranked the highest, followed by decreased use during the semester.

Sub-theme 1: viewing quality

Some students were quite happy with the viewing quality and production value, in particular the videos' resemblance to what was taught in class. They also appreciated the short duration of the videos for ease of study.

"I liked the videos because they were very similar to the way we were shown techniques in class."

"The camera angles [of the online videos] were really good, because they were able to zoom up quite close"

Sub-theme 2: improved understanding

The students almost unanimously responded positively when asked if the online videos had improved their understanding of the unit. Students reported that they improved their familiarity with the content, believed they were a good study tool and that they allowed them to both revise material before and after class.

"[The videos] were a good general overview available before class, so that the content was not so new during class."

"[The online videos] helped me review what content we had already

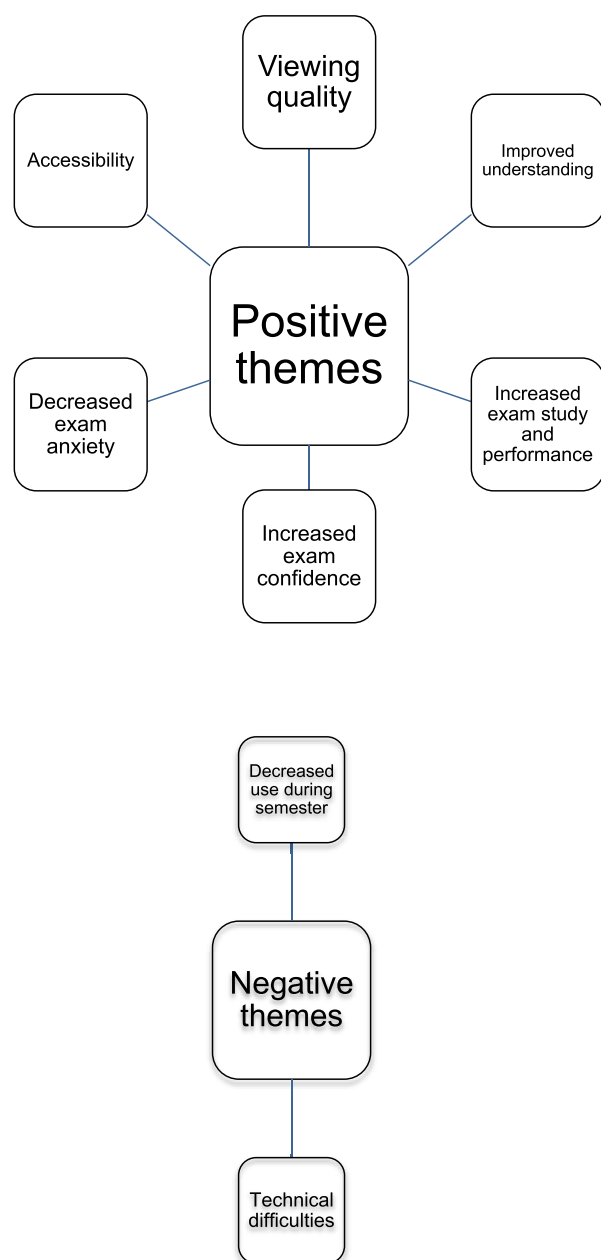


Fig. 3. Thematic map including sub-themes.

Table 1
Survey – Section 1 (use of online videos).

Questions (I use the online videos...)	Never (%)	Sometimes (%)	Often (%)	Very Often (%)
To review techniques before class	37.8	48.6	9.5	4.1
To review techniques after class	21.6	33.8	31.1	13.5
To revise for exams	0	5.4	18.9	75.7
To review difficult techniques	2.7	25.7	27.0	44.6
To learn techniques I could not practice in class	17.6	31.1	28.4	23.0

covered and helped me review difficult techniques.”

Sub-theme 3: increased exam study and performance

Students reported the online videos increased the amount and quality of exam study they undertook and thus had a positive effect on their overall exam performance. Students particularly enjoyed the ease of study that the videos allowed for, and the fact that they could easily review difficult content and content in which they were less familiar with.

“I used the videos mainly for exam study, they definitely improved my exam performance.”

“They [the videos] greatly helped me prepare for my exam, I was quite happy with my performance.”

Sub-theme 4: increased exam confidence

Students identified the online videos increased their confidence for the practical exam in the unit. Students reported the main reasons for this were increased revision, and the confidence that they were performing the techniques properly because they were doing exactly what was on the videos.

“I was able to gather more confidence for the exam when I did watch the videos.”

“[The videos] improved my exam confidence as I was sure I was using the right technique and performing in the correct way.”

Sub-theme 5: decreased exam anxiety

Some students also commented that the online videos decreased their anxiety levels for the practical exams. Despite this not being reported as often as increased confidence, students mostly said that they were less anxious because the videos allowed them to prepare much better.

“The videos relieved my stress and lowered my anxiety because they gave simple and clear instructions.”

“I was still a bit anxious, but the extra revision from the videos definitely helped reduce my anxiety somewhat.”

Sub-theme 6: accessibility

Students almost unanimously reported the videos were very easy to access. They also liked the instruction and encouragement they were given on how to access the online videos throughout the semester.

“[The videos] once you knew how to log-in and navigate through [VU] collaborate the videos where easy as to find.”

“[The videos] are really easy to find and play especially as they are short and specific.”

Sub-theme 7: decreased use during semester

Despite some students using the online videos significantly throughout the semester, many students identified that they did not use them often, if at all, throughout the semester. Students said that time constraints were a major issue in not watching the online videos, and also that the videos were quite similar to what was taught in class.

“I only watched the videos during the exam period because I didn’t have enough time during the semester.”

“I only used the videos to study before exams.”

Sub-theme 8: technical difficulties

Although students found the online videos easy to access, some students reported that there were minor technical difficulties when

Table 2
Survey – Section 2 (perception of online videos).

Questions (The online videos...)	Strongly Disagree (%)	Disagree (%)	Agree (%)	Strongly Agree (%)
Are easy to locate	0	6.8	52.7	40.5
Are easy to play	2.7	25.7	52.7	18.9
Are of good viewing quality	1.4	9.5	64.9	24.3
Help me review material from class	0	1.4	62.2	36.5
Help me prepare for exams	0	0	32.4	67.6
Help me learn independently	0	2.7	63.5	33.8
Motivate me to study	0	28.4	59.5	12.2
Reduce the need to take notes	1.4	29.7	43.2	25.7
Improved my exam performance	0	2.7	64.9	32.4
Reduced my anxiety before the exam	2.7	18.9	51.4	27.0
Improved my confidence for the exam	0	12.2	55.4	32.4
Should be used in my other subjects	0	6.8	60.8	32.4
Have improved my learning experience in this unit	0	1.4	70.3	28.4

Table 3
Content analysis of identified themes from the focus group and long-answer survey question responses.

Theme/Sub Theme	Count	Percentage Text Represented
<i>Positive</i>	310	76
Good viewing quality	15	4
Improved understanding	70	17
Increased exam study and performance	64	16
Increased exam confidence	57	14
Decreased exam anxiety	35	9
Good accessibility	69	17
<i>Negative</i>	62	15
Decreased use during semester	18	4
Minor technical difficulties	44	11

trying to play the videos. Students commonly said they sometimes had trouble loading the videos, and that occasionally all the videos on a given page would play simultaneously.

“[The videos] were easy to find, but it was annoying because sometimes they played all at once.”

[The videos] were easy to find, however sometimes I had difficulty loading them.”

Quantitative and qualitative data comparison

When comparing positive and negative responses between the surveys and interviews, the data showed that students answered Survey 1 slightly more positive (55.1%) than negative (44.9%). There was an increase in positive responses for Survey 2 (88.1%). The total positive responses for the focus groups made up 76% of the coded answers.

Discussion

The aim of the current study was to evaluate first year osteopathic students' use and perceptions of the practical video demonstrations available to them in the Osteopathic Science 1 and 2 units. The videos were designed as a tool to supplement the classroom teaching and provide students with an opportunity to prepare for class, and revise the content pre and post-class, thus aiming to promote an active approach to learning. The students' use of the videos varied throughout the study period. However, the results from the study illustrate the majority of the students who participated in the project perceived VBL to have a positive impact on their learning. This finding is consistent with other authors [13,14,28].

An active and deep approach to learning is generally promoted in the higher education context, as it allows students to actively engage and think deeper about the content, relate it to real-life situations and improve overall student understanding and assessment performance

[14,29,30]. VBL has been shown to assist in the promotion of active and deep learning [14,15], and also higher level learning and thinking [31]. Despite this, the findings from the present study do not appear to indicate the adoption of an active and deep learning approach, but rather a shift away from a surface learning approach and the adoption of a strategic learning approach. A strategic approach to learning occurs when the student focus is on doing well academically and avoiding factors that may harm their academic performance [32]. The strategic model is based on four key tenants: study organisation, time management, alertness to assessment demands and intention to excel [17]. The majority of students reported that they did not use VBL to prepare for class during the semester; rather they used it mainly for exam preparation. This finding closely aligns to a strategic model of study, where the student focus is on alertness to assessment demands and intention to excel, rather than a deep approach, where the intention is to fully understand content and relate it to previous ideas and concepts [17].

Practical exams are associated with high anxiety levels amongst students [18], and high anxiety levels can impact negatively on exam performance [16]. Pre-test anxiety leads to feelings of low confidence, poor self-worth and a fear of failure. Student fear of failure has been shown to be associated with a surface learning approach [17]. Students in the present study reported that access to VBL decreased their exam anxiety and increased their exam confidence. The reported decrease in pre-exam anxiety, and thus decreased fear of assessment failure, through using the VBL resources appears to be a factor in facilitating the shift away from a surface approach to a structured one. It is likely that the aforementioned shift is a key component in the reported positive perceptions on student practical assessment performance.

Lack of good access to computer-based learning has been shown to be a hurdle in the use of class material from students who are considered 'digital natives' [19] and is thought to be a factor in the potential for a 'digital divide' between students [20]. Despite the students' heavy use of the online videos during the exam period, the present study found that a number of students were not accessing the videos often, or at all, during the semester. Reasons that were highlighted by the participants included experiencing minor technical difficulties when accessing the videos, but there were no reported widespread major accessibility hurdles. Taking this into account, in addition to the high survey response rate and the large proportion of positive survey responses, fortunately there appears to be no major 'digital divide' emerging between this cohort of students. Adult students better comprehend course content when understanding the reasons underpinning a curriculum structure [33]. Given that the use of blended learning (including VBL) in higher education is rapidly increasing and evolving [15,22], designers of modern tertiary curriculum should look at all aspects in improving student access to and engagement in blended learning material. Perhaps by placing a greater emphasis on the benefits of accessing the videos before class via the flipped classroom model [34], it could result in an increased use of VBL during the semester.

It appears that overall, VBL facilitated a positive learning environment for the students because it promoted effective and increased exam revision, allowing students to focus on the finer, deeper details of the practical components, predominately during the exam study period. These findings indicate that VBL, and more broadly blended learning, is an important part of current and future pedagogical practices in Osteopathic clinical education. Students overwhelmingly reported that they would like to see VBL used more across their course. Future research should investigate the learning effects of VBL across other units, courses and institutions, in different locations and demographics. It should also evaluate and correlate the effect of VBL on assessment results.

Limitations

Despite the positive findings of the study, there were several research limitations found. There was no comparison between the students' exam results and their use of the online videos. This was not possible however, given the surveys were confidential and because the students only receive a pass or fail grade for the subject and exam. In addition, the self-reported log data was used due to the inaccuracies in the LMS log data reporting. There was also no post-analysis review of the qualitative analysis of the focus groups to confirm its accuracy, however this was negated by having peers independently review the qualitative data. Finally, the researcher was also a part of the Osteopathic Science teaching team at the time of data collection and perhaps a social desirability scale to correct for socially desirable response bias could have been used [35]. However, given the results of the study are in-line with similar research [13,14,28], the author's feels their involvement did not have a major impact on the study findings and therefore a social desirability scale was not used.

Conclusion

This study indicates that complementary VBL in a first year osteopathic practical skills based subject is effective in promoting a structured approach to learning. The present study also illustrates, via a shift away from a surface approach to learning, that complementary VBL can help reduce exam anxiety, improve exam confidence and thus lead to an improvement in perceived exam performance. Overall, most students reported that VBL had a positive effect on their learning in the unit. Future research should evaluate the effectiveness of VBL across different units, courses and institutions and aim to directly correlate student use and perceptions to assessment scores.

Statement of competing interest

The author declares there are no conflicts of interest.

Ethical approval

Ethical approval to conduct the study was obtained from the VU Human Research Ethics Committee (Approval Number: HRE 15-186).

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijosm.2018.09.004>.

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