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ORIGINAL ARTICLE

ORAL SURGERY

# Development and impact of a clinical instructional video on self-confidence in luxator use amongst dental undergraduates

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## Abstract

**Objectives:** The aim was to develop a clinical instructional video to increase the self-reported confidence levels of dental undergraduates in different aspects of using a luxator.

**Methods:** Distribution of a questionnaire allowed fourth- and final-year dental students ($N = 165$) at the University of Leeds to report their confidence in different aspects of luxator use. After the development and distribution of a clinical instructional video, student could evaluate the effectiveness of the video and report their confidence levels through a second questionnaire and focus group interviews. The pre- and post-video questionnaire results were compared using descriptive statistics. Reflexive thematic analysis was used to analyse data collected through focus group interviews.

**Results:** The response rate of completed questionnaires was 49% pre-video ($N = 82$) and 29% post-video ($N = 49$). The mean percentage of students who reported high confidence levels was lower before viewing the video (26.8%) than after (69.4%). The reasons behind reported confidence levels varied for each individual. The video was considered to be highly effective in allowing visualisation of technique and viewed as a valuable resource for revision. Whilst students perceived that the video had a positive impact on their self-confidence, they still expressed need for small-group practical teaching regarding luxators.

**Conclusions:** The utilisation of a clinical instructional video resource increased the self-reported confidence levels of dental undergraduates in different aspects of using a luxator.

KEYWORDS
dental education, instructional films and videos, oral surgery, self confidence

## INTRODUCTION

Over the last decade, the volume of referrals from primary care to specialist oral surgery services has significantly increased.[1] Therefore, it is key that dental schools produce graduates confident and competent in their exodontia skills. Such graduates would be able to recognise and safely carry out Tier 1 treatment, subsequently helping to alleviate an already high demand placed on hospital-based oral surgery services.[1,2]

Previous studies have shown a high self-perceived confidence of undergraduates in simple forceps extractions.[3–5]

However, students report less confidence in performing procedures which may necessitate the use of luxators and elevators.[5,6] Despite being widely used instruments in exodontia, there is no indication that any UK dental school assesses competency in using luxators or elevators.[7] Furthermore, few studies report on undergraduates' confidence in using elevators and none which specifically focuses on luxators.[8]

At the University of Leeds only 41% of dental undergraduates surveyed reported having received teaching specific to luxator extraction technique.[9] Due to the sharp nature of luxator blades, knowledge of safe technique is paramount in order to avoid injury to both the patient and the operator.[7] As there is a lack of existing academic literature outlining safe luxator technique, it is vital that teaching on their correct handling and application is delivered within the curriculum.

An important aim of all dental school curricula is to produce graduates who are confident in their clinical skill. Consequently, self-confidence of undergraduates in performing oral surgery procedures has been investigated using quantitative means.[5,6,10] However, there is a lack of qualitative studies which analyses the underlying reasons behind students' confidence in the aforementioned areas.

The aim of this mixed-methods study was to develop a clinical instructional video to increase dental students' self-reported confidence levels and to assess the effectiveness of the video through questionnaires and focus group interviews.

**Clinical Relevance**

*Scientific rationale for study*: Lack of previous literature investigating dental students' self-perceived confidence in luxator use. Our study explores the impact of a clinical instructional video on the self-reported confidence levels of dental undergraduates.
*Principal findings*: Generally low levels of confidence in all aspects of luxator use was reported by the dental students surveyed. Introduction of the instructional video was perceived to have a positive impact on self-perceived confidence levels.
*Practical implications—suggestions for clinical practice*: The reasons behind dental students' self-confidence in luxator use are multi-faceted and warrant further study. The integration of video resources alongside teaching in a small-group setting could be beneficial to the preparation of students for extractions which require the use of a luxator.

## MATERIALS AND METHODS

### Questionnaires

Two online questionnaires were designed to collect information on the students' self-reported confidence levels before and after the video. To pilot both questionnaires prior to distribution, the authors tested the questionnaires on two university staff selected from the School of Dentistry. Questionnaire 1 collected information on confidence levels prior to students viewing the video, whilst Questionnaire 2 collected information after. Students had 7 days after the distribution of the Questionnaire 1 before the video link was made available to them through a separate email. The Questionnaire 2 was distributed 7 days after the video link was published. To encourage completion of the questionnaires, both emails were sent on a second occasion 2 days after their initial distribution. Both questionnaires were distributed using an electronic link to an online survey platform which ensured anonymity.

Both questionnaires utilised a four-point Likert-type scale and were developed based on previous surveys utilised in similar studies.[5,6]

Ethical approval was granted by the University of Leeds Research Ethics Committee, School of Healthcare (SHREC).

### Video resource

A clinical instructional video resource was developed by the authors, one of which at the time was a final year dental surgery student and one a Specialist Oral Surgeon. The video demonstrated luxator technique both on a phantom-head with model teeth and clinically on a patient (Figure 1A). The topics covered included features of different luxators, correct hand grip (Figure 1B) and correct positioning (Figure 1C). Appropriate consent was obtained from the patient as per the Trust's protocol. The video was three and a half minutes in length with a voice-over narration and was available to view on the University of Leeds, School of Dentistry's YouTube channel via an electronic link emailed to students.

### Participants

Questionnaires 1 and 2 (see Appendix A) and information sheet (see Appendix B) were distributed to all fourth- ($N = 79$) and fifth-year ($N = 86$) undergraduate dental students at the University of Leeds. Both questionnaires were distributed via email with an attached information sheet which outlined the purpose of the study and explained that participation is anonymous and voluntary. Consent was implied by completion of the questionnaire.

An invitation to participate in the focus group interviews was also sent out via email at the same time as the first email containing Questionnaire 1. Participant selection was on a voluntary, first-come-first-served basis.

At the University of Leeds, both fourth- and fifth-year dental students would have received the same baseline of

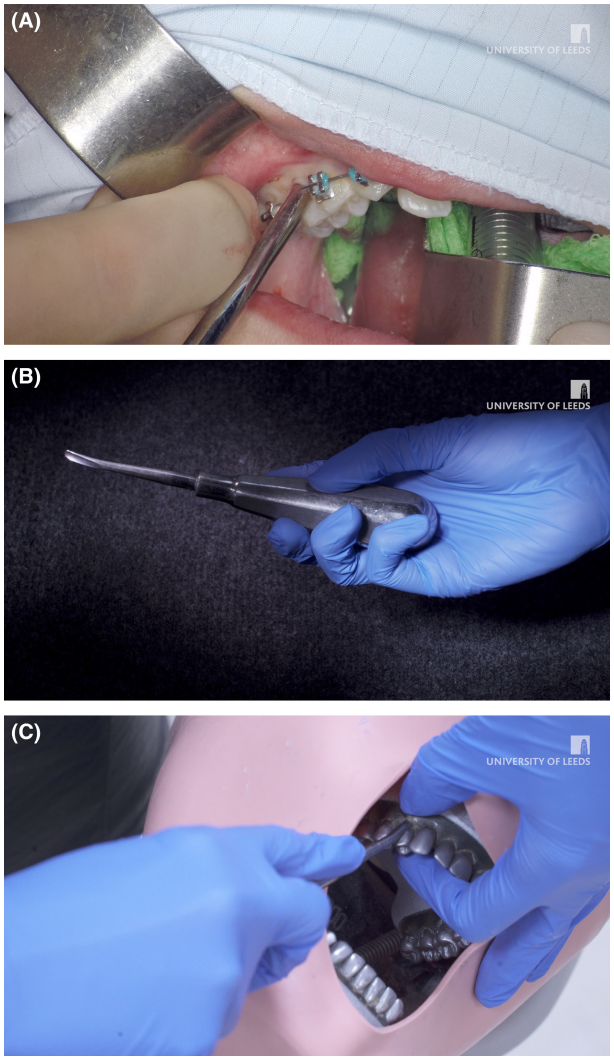


**FIGURE 1** (A) Screenshot from instructional video demonstrating luxator application clinically on a patient. (B) Screenshot from instructional video demonstrating correct hand grip on a luxator. (C) Screenshot from instructional video demonstrating correct positioning on model teeth.

lecture-based teaching prior to the questionnaires' distribution. Lectures and handouts would have covered the topics of instrumentation (the use of forceps, elevators and luxators) and managing complications following an extraction. All students would have undergone a 'Forceps extraction test' in their third year, which would assess correct technique and instrument selection regarding forceps only, conducted in the style of an Objective Structured Clinical Examination. At the time of this study, there was no competency assessment in place for using elevators or luxators. Students would receive hands-on teaching when performing extractions at the acute dental clinic (ADC) on a fortnightly basis. Final-year students were expected to have a greater level of practical experience as they would have had an additional year of timetabled ADC sessions, although experience varied greatly between each student due to the unpredictable nature of the clinics. By the end of their fifth-year, students were expected to perform at least 50 extractions overall but there was no yearly requirement in place for the end of fourth year.

### Focus-group interviews

Data were collected through two focus-group interviews led by one of the authors, using a semi-structured interview style and lasted 30 min each. Focus group one had fifth-year student participants and focus group two had fourth-year student participants to allow for comparison. The interviews were audio-recorded and transcribed verbatim for later analysis.

### Analysis

Data from Likert-type scale were grouped into positive responses indicating higher confidence (very confident/confident) or negative responses indicating lower confidence (slightly confident/not confident) for analysis.

Qualitative data of free-text responses and transcription of the focus groups were coded by the researcher using NVivo 12 Plus ® software. A reflexive thematic analysis[11] was utilised as it allowed initial themes developed from questionnaire written responses to guide data collection during focus group interviews. The resulting themes were reviewed, defined and formed the basis of the results presented.

## RESULTS

### Demographic information

Eighty-two of the 165 fourth- and fifth-year students completed the Questionnaire 1 and 49 completed the Questionnaire 2 giving a response rate of 49% and 29% respectively. Fifth-year students had a higher response rate in both Questionnaire 1 (59%) and Questionnaire 2 (69%).

Of the 15 students who initially volunteered for the focus group, 12 students attended the appointment, of which six were fourth-year and six were fifth-year students.

### Measure of current self-perceived confidence

Table 1 summarises the results from section 2 of both questionnaires.

Before viewing the instructional video, the mean percentage of students who indicated higher confidence levels (confident/very confident) in different aspects of using a luxator was 26.8%. Students felt they were least confident in their ability to choose an appropriate type of luxator for a clinical situation (90.2%) and their ability to use a luxator without any assistance (79.3%).

Comments from focus groups [FG1], [FG2] and written responses [WR] from both questionnaires showed a

**TABLE 1** Results from section 2 of questionnaire 1 and 2

| Before video | Total $n = 82$ | | After video | Total $n = 49$ | |
|---|---|---|---|---|---|
| Statement | Ranking | | Statement | Ranking | |
| "How confident are you in … | Slightly confident/not confident $n$ (%) | Very confident/ confident $n$ (%) | How confident are you in … | Slightly confident/not confident $n$ (%) | Very confident/ confident $n$ (%) |
| 3.1. … being able to describe how to use a luxator?" | 57 (69.5) | 25 (30.5) | 3.1. … being able to describe how to use a luxator?" | 9 (18.5) | 40 (81.6) |
| 3.2. … being able to identify a clinical situation where the use of a luxator is indicated?" | 64 (78.1) | 18 (22) | 3.2. … being able to identify a clinical situation where the use of a luxator is indicated?" | 15 (30.6) | 34 (69.4) |
| 3.3. … being able to use a luxator during tooth extraction on a patient without any assistance?" | 65 (79.3) | 17 (20.7) | 3.3. … being able to use a luxator during tooth extraction on a patient without any assistance?" | 20 (40.8) | 29 (59.2) |
| 3.4. … being able to describe the benefits and risks of using a luxator?" | 53 (64.6) | 29 (35.4) | 3.4. … being able to describe the benefits and risks of using a luxator?" | 15 (30.6) | 34 (69.4) |
| 3.5. … being able to differentiate a curved luxator from a straight luxator?" | 47 (57.3) | 35 (42.7) | 3.5. … being able to differentiate a curved luxator from a straight luxator?" | 8 (16.3) | 41 (83.6) |
| 3.6. … being able to identify a clinical situation where the use of a curved luxator would be indicated as opposed to a straight luxator, and vice versa?" | 74 (90.2) | 8 (9.8) | 3.6. … being able to identify a clinical situation where the use of a curved luxator would be indicated as opposed to a straight luxator, and vice versa?" | 23 (47) | 26 (53.1) |
| Mean reported confidence level (%) | 73.2 | 26.8 | Mean reported confidence level (%) | 30.6 | 69.4 |

recurrent theme of the 'need for visual learning'. Students repeatedly reported that one-on-one visual demonstrations prior to using a luxator in a clinical setting had a positive effect on their self-perceived confidence. Students reported that in hindsight, the demonstrations made them feel more confident in subsequent clinical sessions:

> I felt unprepared, and the tutor demonstrated on a model how to use it before she let me. Before then I had not seen the technique demonstrated to me. I felt more confident after I was shown, but I asked the tutor to watch me after.
>
> [WR]

> A luxator was required to remove a retained root … My tutor showed me precisely how to use the instrument for my clinical situation using metal teeth models. Without this I wouldn't have felt confident using it.
>
> [WR]

> My confidence greatly increased once given a one-to-one demo by the tutor. Then I felt I knew what I was doing when I went on clinic.
>
> [FG2 – Student 2]

## Evaluation of previous teaching

Twenty-eight percent of the respondents indicated that they either did not receive or could not remember if they received any pre-clinical teaching on luxators from the School before patient exposure. Figure 2 illustrates that of those students that received teaching via lectures, 55.9% found it was only slightly effective in increasing their confidence to use luxators. Not all students received teaching with regard to luxators on ADC, but 62.7% of respondents reported the demonstrations to be effective/very effective on increasing their confidence.

While teaching on ADC was valued, students in the focus groups commonly reported that they could not engage fully with the luxator demonstrations if they were given during an extraction. Students attributed their disengagement to the high-pressure nature of the environment or due to lack of explanation and reflection from clinical tutors:

> When you're on ADC and doing an extraction, it's already nerve-racking … anything that [the tutors] say, you're only kind of 'half-taking in.'
>
> [FG2-Student 11]

> Sometimes [on ADC] it's just "Go and get a luxator". If there was just a little more explanation that goes along with it, then you might learn more from that experience …
>
> [FG1-Student 5]

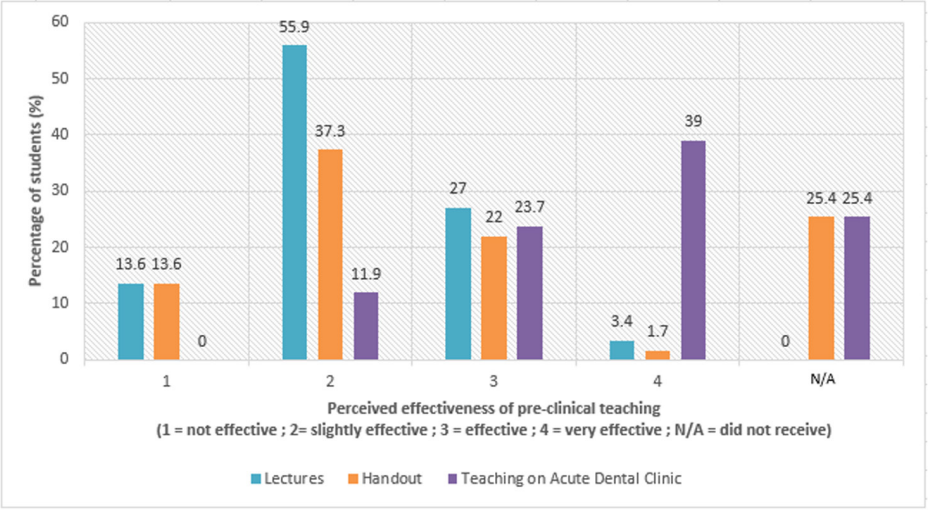


**FIGURE 2** Perceived effectiveness of pre-clinical teaching in oral surgery reported by dental undergraduates at the University of Leeds.

## Evaluation of video resource

Students responded positively when evaluating the video's effect on increasing their confidence regarding theoretical understanding (96%) and practical ability (79.6%). After watching the video, a mean percentage of 69.4% reported a higher level of confidence in all aspects of using luxators. Compared to before watching the video, students indicated the greatest increase in confidence within their ability to describe how to use a luxator and the ability to identify a situation where a luxator is indicated.

Focus group comments indicated a difference between how fourth-year students and fifth-year students perceived the video. A theme amongst fourth-year students was that they expressed a greater 'need for kinaesthetic learning' to enhance the knowledge gained from the video. Students reported that small group tutorials would make them feel more confident in their practical ability:

> Practical seminars … would be useful. The video gave me good knowledge, but I would like to hold and try how to use [a luxator] as well.
>
> [FG2-Student 8]

> The video is really good, but I feel like that alone would not make me comfortable in doing it straightaway on a patient. I would like to have a practical [tutorial] and then I would feel more comfortable…
>
> [FG2-Student 9]

On the other hand, the theme amongst fifth-year students was that they already reported a benefit from using the video as a 'revision tool' prior to clinical sessions:

> I watched the video and then I had some extractions, and I remember thinking about the video … I think I will keep using [the video] as a refresher.
>
> [FG1 – Student 4]

> It's useful to have [the video] because we only have [ADC] once a fortnight. It's nice to have a refresher.
>
> [FG1-Student 1]

Overall, the students' feedback revealed that they felt reassured that the knowledge provided by the video was 'university-approved':

> I think we all need that baseline from the video. Otherwise, you leave dental school knowing only what your tutor told you, but you all have different ones.
>
> [FG2-S10]

## Experience in using luxators

Fifth-year students reported higher levels of previous clinical experience in using luxators (89.3%) than fourth-year students (34.2%).

When asked about their previous experiences of using luxators, students described themselves as feeling 'unprepared' or 'incompetent'. Common overarching themes included feedback that students did not know what they were 'feeling for' with a luxator and whilst they knew they could cause damage with it they were unaware of how to apply safe practice.

Of the participants who had previous extraction experience with a luxator, 69.1% still reported lower confidence levels when asked about their ability to use luxators without assistance. Focus group comments from students with previous experience of using a luxator indicated that lower

confidence was linked to three repeated themes: a fear of 'causing damage', a fear of 'forgetting' the taught material due to lack of frequent clinics or due to a 'previous negative experience' with a luxator:

> We just get told that [a luxator] can cause a lot of damage. We don't get taught how to prevent [damage] or what to do after.
>
> [FG1-Student 3]

> I was quite lucky to do a few extractions, especially using luxators and elevators. But I wouldn't say that [previous experience] has made me much more confident in using them in the future because I've forgotten it all …
>
> [FG1 – Student 2]

> "The second time I ever used a luxator … it slipped. It really put me off [using luxators]". And because of this experience I am now always very cautious about [using luxators].
>
> [FG1 – Student 6]

Of the students who reported that they have performed an extraction with a luxator after having watched the video, 91% reported that it positively impacted their confidence level of using the instruments. Students commented that similar video resources would be beneficial for distinguishing between exodontia techniques:

> We always hear "You can't elevate with a luxator" … it gets confusing between what is an elevating motion and what is a luxating motion
>
> [FG1-S4]

## DISCUSSION

The results obtained from this mixed-methods project are indicative of a low level of self-confidence in using luxators amongst fourth- and final-year students, based on previous teaching from the School. This is in line with previous studies which show that dental students feel less confident performing oral surgery procedures which may require instrumentation other than forceps.[5,6]

The work of Stewart et al.[12] suggested that increased experience enhanced self-reported confidence in medical house officers. However, it was apparent from this study that the reasons behind students' low confidence levels cannot simply be attributable to one factor such as a low-level of exposure but have a more multi-faceted cause. Experiential teaching via experience of providing a service on ADC under direct supervision was the most well-received educational method provided by the School and it is a method frequently utilised in dental education.[13] Nevertheless, the University of Leeds students perceived that teaching on ADC often lacked key elements of experiential education such as explanation or reflection, making previous learning experiences insufficient at impacting how students approached new experiences with luxators.[14]

Moreover, students described a growth in their self-confidence after an experience of 'seeing' (visual learning) and 'feeling' (kinaesthetic learning) with a luxator, prior to patient exposure. The instructional video provided the platform for students to visualise luxator technique in a uniform, efficient way within a safe environment. This enabled them to grasp basic techniques in their self-study and enhanced their ability to focus during a clinical session, in agreement with previous literature.[15,16] The current study reinforced findings from other studies that video-instruction enhanced perceived confidence in clinical skill and theoretical understanding.[17,18] Reported levels of confidence are not equal to competence however under- and over-confidence does have an important implication for practice, resulting in graduates who are either overtly reliant on trainers or who may risk patient safety. Future studies are needed to investigate perceived confidence alongside a competency test when evaluating the effect of instructional videos on skill acquisition.

Although positive perceptions of the video were evident in the study, students expressed that it should not be the stand-alone teaching in the curriculum with regard to luxators but rather a revision-aid to compliment small-group practical sessions. This preference may be due to the ability of practical sessions to combine visual and kinaesthetic methods of learning generally favoured by dental students and provide opportunities to question the tutor.[19] This differs to findings by Smith et al.[20] who reported that students preferred video as opposed to live demonstrations.

This research is a pilot study and was limited to recruit only students from the University of Leeds Dental School, therefore the attitudes and perceptions of the students may differ in other UK dental schools due to differences in delivery of the curriculum. Distribution of questionnaires to other dental schools may be needed to assess whether confidence levels in luxator use are equally low nationwide. Both questionnaires had a low response rate which may have influenced the accuracy of the results. Furthermore, as response rates to the questionnaires were lower than initially expected, grouping the Likert-type scale responses into two options allowed for a more straightforward presentation. In hindsight, due to the low response rates a simple confident/not confident question would have been more beneficial.

The questionnaires did not collect information about participants' gender or their clinical experience (in terms of number of teeth extracted) prior to this study. Previous studies suggest that these factors can influence how students self-report on confidence within oral surgery and in hindsight, could have provided a greater depth of insight when interpreting the results of this study.[8,21]It is also plausible that the positive feedback on the instructional video was because students who benefited more from it had a greater tendency to respond to the second questionnaire or volunteer for the focus group. Therefore, a more randomised

participant selection method may be favourable to eliminate volunteer bias.

The low levels of confidence in luxator use reported by students across both years is of concern and may indicate a need for the introduction of mandatory competency assessments by the School, for example by using direct observation of procedural skills which are common workplace-based assessments for foundation trainees.[22] Whether similar levels of low confidence are present nationally in dental undergraduates should be investigated. If not addressed, there may be a risk of creating newly qualified graduates whose low confidence in luxator exodontia technique could become an additional deterrent to undertaking minor oral surgery procedures.[23] Minor Oral Surgery referrals currently represent the largest in cost to the NHS, out of the referrals made from GDP to secondary care and therefore seeking to produce graduates more confident in areas of this speciality may aid in future cost reduction for the NHS.[24,25]

Overall, video resources have the potential to enhance the learning experience of students by delivering information through visual, textual and auditory means. Whilst this study was conducted prior to the outbreak of the novel coronavirus disease (COVID-19) in December 2019, the implications caused by the pandemic if anything, highlight the need for incorporating blended learning within dental education.[26,27] The results of this study are limited to investigating the impact of video-based teaching in exodontia. However, it would be worthwhile to further explore the effects of faculty-developed videos on students' long-term retention of knowledge and their perceptions of these resources within oral surgery, as well as in other areas of the dental undergraduate curriculum too.

## CONCLUSION

Final and fourth-year dental students at the University of Leeds generally reported a low level of confidence in all aspects of luxator use. Introduction of an instructional video demonstrating correct luxator technique was perceived to have a positive impact on students' self-perceived confidence levels. The reasons behind students' self-confidence levels are multi-faceted but the integration of video resources alongside teaching in a small-group setting could be beneficial to the preparation of students for extractions which require the use of a luxator.

### CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## APPENDIX A

**Questionnaires 1 and 2**

## QUESTIONNAIRE 1

### Part 1 – Personal information

Which year of your dental undergraduate degree are you currently in?

- *4th year*
- *5th year*

Did you receive pre-clinical teaching regarding luxator instruments prior to being expected to use the instruments during exodontia on patients?

- *Yes*
- *No*
- *Cannot remember*
- If you answered 'Yes' to the previous question, please indicate which form of pre-clinical teaching you received from the Dental School and its effect on increasing your confidence in the use of luxator instruments *prior* to using them on patients (1 = not effective and 4 = very effective and N/A if did not receive)

| | 1 (not effective) | 2 (slightly effective) | 3 (effective) | 4 (very effective) | N/A (did not receive teaching) |
|---|---|---|---|---|---|
| Lectures | O | O | O | O | O |
| Handout | O | O | O | O | O |
| Teaching on acute dental clinic | O | O | O | O | O |
| Other (please specify) | O | O | O | O | O |

**Part 2 - Clinical confidence**

Please indicate your CURRENT level of confidence regarding the statements below on a scale of 1–4 (1 = not confident 4 = very confident).

| How confident are you in …? | 1 (not confident) | 2 (slightly confident) | 3 (confident) | 4 (very confident) |
|---|---|---|---|---|
| … being able to describe how to use a luxator | O | O | O | O |
| … being able to identify a clinical situation where the use of a luxator is indicated | O | O | O | O |
| … being able to use a luxator during tooth extraction on a patient without any assistance | O | O | O | O |
| … being able to describe the benefits and risks of using a luxator | O | O | O | O |
| … being able to differentiate a curved luxator from a straight luxator | O | O | O | O |
| … being able to identify a clinical situation where the use of a curved luxator would be indicated as opposed to a straight luxator, and vice versa | O | O | O | O |

Please indicate your level of agreement with the statements below on a scale of 1–4 (1 = strongly disagree 4 = strongly agree).

| | 1 (strongly disagree) | 2 (disagree) | 3 (agree) | 4 (strongly agree) |
|---|---|---|---|---|
| 'The pre-clinical teaching I received from the dental school enhanced my theoretical understanding of luxators' | O | O | O | O |
| 'The pre-clinical teaching I received from the dental school made me feel confident in practically using a luxator during a tooth extraction on a patient' | O | O | O | O |
| 'If I received more "practical" pre-clinical teaching (such as workshops, tutorials) on luxators, I would feel more confident about using a luxator' | O | O | O | O |

Do you have any experience in using a luxator on a patient during a tooth extraction?
O*Yes* O *No*.
If you indicated 'Yes' for the previous question:
Please give details of your first experience of using a luxator on a patient during a tooth extraction, with regard to how *prepared* you felt and your level of *confidence* in your own skill at the time:

If you indicated 'No' for the previous question:
Please indicate your level of agreement with the statements below on a scale of 1–4 (1 = strongly disagree 4 = strongly agree).

| **'I have not used a luxator during a tooth extraction yet because …'** | **1 (strongly disagree)** | **2 (disagree)** | **3 (agree)** | **4 (strongly agree)** |
|---|---|---|---|---|
| '… there was no clinical opportunity where it was appropriate to use one'. | O | O | O | O |
| '… there was an appropriate clinical opportunity, but I did not feel confident enough to use one'. | O | O | O | O |
| '… I am unable to identify a clinical opportunity where it would be appropriate to use one'. | O | O | O | O |

## QUESTIONNAIRE 2

### Part 1 – Personal information

Which year of your dental undergraduate degree are you currently in?

- *4th year*
- *5th year*

**Part 2 - Clinical confidence**

Please indicate your CURRENT level of confidence regarding the statements below on a scale of 1–4 (1 = not confident 4 = very confident).

| **How confident are you in …?** | **1 (not confident)** | **2 (slightly confident)** | **3 (confident)** | **4 (very confident)** |
|---|---|---|---|---|
| … being able to describe how to use a luxator | O | O | O | O |

| How confident are you in …? | 1 (not confident) | 2 (slightly confident) | 3 (confident) | 4 (very confident) |
|---|---|---|---|---|
| … being able to identify a clinical situation where the use of a luxator is indicated | O | O | O | O |
| … being able to use a luxator during tooth extraction on a patient without any assistance | O | O | O | O |
| … being able to describe the benefits and risks of using a luxator | O | O | O | O |
| … being able to differentiate a curved luxator from a straight luxator | O | O | O | O |
| … being able to identify a clinical situation where the use of a curved luxator would be indicated as opposed to a straight luxator, and vice versa | O | O | O | O |

**Part 3 – Assessment of the educational videos**

Please indicate your level of agreement with the statements below on a scale of 1–4 (1 = strongly disagree 4 = strongly agree).

| | 1 (strongly disagree) | 2 (disagree) | 3 (agree) | 4 (strongly agree) |
|---|---|---|---|---|
| ' Watching the video has increased my confidence in my *theoretical understanding* of what a luxator is and how to use it' | O | O | O | O |
| 'Watching the video has made me feel more confident about *practically* using a luxator during a tooth extraction, without any assistance' | O | O | O | O |
| 'My confidence regarding using luxators would benefit from having access to the video prior to a tooth extraction' | O | O | O | O |
| 'I would regularly make use of the video to refresh my memory prior to a tooth extraction' | O | O | O | O |
| 'The content of the video needs improvement to make them beneficial to my learning' *(If strongly agree/ agree = give reasons for your answer)* | O | O | O | O |
| 'The length of the video should be shorter' *(If strongly agree/agree = give reasons for your answer)* | O | O | O | O |

Is there anything else about the video you would like to say? (Please comment below).

## APPENDIX B

### Student participation information sheet

### STUDENT PARTICIPANT INFORMATION SHEET

**Study Title:** A study to assess the impact of an instructional video on the self-confidence of fourth and final-year dental undergraduates in using luxators.

**What is the purpose of the study?**
I am doing this study to find out how confident dental students are in their knowledge of and ability to use luxators and whether their confidence levels are increased by watching a teaching video which demonstrate how to use luxators. This research is part of my Final Year Project and I plan on communicating my studies with the School of Dentistry, University of Leeds to allow further developments in how the curriculum is taught regarding luxator instruments. My findings will be communicated to a wider audience through presentations and publications.

**Why have I been invited?**
I am contacting you because you are in either the fourth or fifth year of your dental degree and therefore have received teaching on luxators from the School of Dentistry; these are the criteria for being a participant in this study.

**Do I have to take part?**
No—it is completely up to you to decide.

If you are interested in participating in the first part of this study, you can do that by filling out the pre-video questionnaire, watching the teaching video and completing the post-video questionnaire. They will be available for you to access through three separate e-mails sent to you, and each email will have the information sheet attached. I will assume that you consent to participating in the study by completing each questionnaire. However, even if you consent to complete the first questionnaire, that does not mean you have to continue to participate in the whole study by completing the second questionnaire; you are free to withdraw from it any time up to the point when data is anonymised.

If you are interested in participating in the second part of this study through a focus-group interview, I will go through this information sheet with you beforehand to ensure your understanding and you will be given a consent form to sign. You can ask me any questions you may have before deciding to take part, via the email address above. Even after giving consent by signing the consent form, you are free to withdraw from participation in the interview until the audio-recording is started; then you cannot withdraw after that point.

**What does the study involve?**
If you choose to participate in the first part of the study, you will be asked to follow a link emailed to you to complete an online questionnaire through which I can find out about your opinion on the teaching you have received from the School in terms of luxators, and your self-perceived confidence in using luxators as a result. After a short amount of time, you will receive another e-mail with a link to the teaching video; you will be asked to watch it. After 7 days, a third and final email will ask you to complete the post-video questionnaire to find out how your confidence levels have changed. Each questionnaire should take roughly 2–3 min to complete and the video you will be asked to watch will be no more than 3 min 30 s long.

In the second part of the study, I will invite up to 15 dental students to take part in a focus-group interview. If you choose to volunteer to take part, you will be asked to attend a short session (lasting no more than 30 min) to discuss both questionnaires in more detail, to allow me to gain insight into the reasons behind your confidence levels relating to luxator use. You will also be encouraged to express your opinion on past teaching and the usefulness of the videos. I will audio-record the session so that I can remember the opinions expressed, and I may choose to quote some of the things you said in my study. You are not obligated to answer any of my questions made to you during the focus-group interview, however you cannot withdraw from the study once the audio-recording has begun.

**Where will the research be done?**
You can complete the questionnaires and watch the video anywhere as they will be online.

All the focus-group interview sessions will take place in private seminar rooms in the School of Dentistry at the University of Leeds. We will agree mutually convenient times to meet.

**What about anonymity and confidentiality?**
Your participation by completing the questionnaires in this project is confidential to you. All data from the questionnaires will be automatically anonymised.

If you choose to partake in the focus-group interviews, I ask that you also maintain the confidentiality of others taking part in the interview by not revealing their participation to others or relaying any information or opinions expressed during the interviews. To maintain confidentiality, I also ask that you do not mention your own name, the names of your peers or your clinical tutors during the interview.

The audio recordings will be confidential and only accessible by me and my supervisor. The audio recording will be kept securely on an encrypted USB memory stick, in a locked personal safe. Your consent form and the audio tape will be kept in a locked cabinet in the Dental Institute only accessible to me. In order to protect your identity your name and details will not be available to anyone else and the data I collect from this study will be anonymised. I may share the results of this study, for example by presenting them at a conference or publishing them in a journal, however no details which could potentially reveal your identity will be shared. My supervisor may become aware of the names of who is taking part but will keep this information confidential.

I must make you aware that there are some limits to confidentiality in research. It is unlikely to be relevant to this research, however I am obliged to tell you that if you reveal to me any criminal activity you have been involved in, or any intention to harm yourself or others, I will be obliged to contact my supervisors to discuss what to do, which could mean informing relevant authorities. However, I can reassure you that my interview does not actively seek such information.

**Are there any risks in taking part?**

I do not expect there to be any significant risks in taking part; the focus-group interviews will be conducted in a supportive manner. I am interested in your opinion about how previous teaching on luxators and watching the videos has affected your confidence, which areas you feel more confident in when using luxators and the possible reasons behind that. You can choose to share your past experiences to do this, however, the interviews will focus away from evaluating your past performance or the performances of others.

You do not have to answer any particular question if you do not wish. If you find anything unsettling during the process, the details of support services are available at the bottom of this sheet.

**Are there any benefits in taking part?**

Your self-reflection through the focus-group interviews and/or the online questionnaires on your confidence in using luxators may highlight any areas for development and therefore improve your skills as a clinician. Hopefully, watching the teaching videos will contribute to your understanding of luxators and enhance your clinical skills when using them in the future.

The data from this study will also advise the School of Dentistry, University of Leeds by providing feedback on their past teaching and aid in them and other dental schools to deliver the curriculum in such a way which helps dental students feel confident when using luxators in the future.

As an appreciation for taking the time to complete the surveys, you can choose to provide your email address to be entered into a prize draw to win one of five £10 Amazon vouchers; each survey completed counts as one entry.

If you decide to volunteer for the focus-group interview, this will earn you an additional two entries into the prize draw. You will also receive complementary snacks after the interview.

**Ethics**

This project has been granted ethical approval through the Dental Research Ethics Committee (DREC) which is part of the Faculty of Medicine and Health at the University of Leeds (Ethical approval number: FYP2018LUXATOR date: 14/11/18).

If you have any complaints about my contacting you, or anything that happens during our meetings, please contact my supervisor, who will be happy to discuss what action to take.

I hope you have enough information about my study, but if you would like to ask any questions please send me an email.

Support services:

If you feel you need support or advice, please contact your personal tutor or alternatively advice is available from:

The student counselling centre: 0113 343 4107.