1. **Summary**

One of the key objectives of the Scottish Patient Safety Agency (SPSA) is a reduction in adverse drug events (SPSA 2007). With medicines management being a key clinical quality indicator which can enhance patient safety (Scottish Executive Health Department 2006), it is essential that higher education institutions play their part in helping to meet this patient safety objective by effectively educating students in this vital part of their role.

Using existing facilities within Edinburgh Napier University, we developed a media clip to be accessed as an adjunct to taught clinical skills sessions via the University’s Virtual Learning Environment. Evaluation was undertaken through statistical analysis of assessment results and satisfaction ratings, in addition to qualitative data gathered from focus group interviews.

Significant (p = 0.021) (n = 322) statistical evidence of an association between cohort and examination outcome was found, with students in the Intervention cohort performing better. Student satisfaction scores (n = 235) on 11 out of the 21 questions on the survey tool differed between the two cohorts at the 5% level of significance. In each of these questions, students who received the online video were more satisfied. Focus group data analysis identified 2 key Categories; Classroom Learning and Transfer to Practice.

This unique project addresses current gaps in the knowledge base in relation to computer based video instruction as an instructional method for clinical skills, providing strong evidence to support the use of this teaching approach in this context.

2. **Original aims**

The original aim of the project was to produce and evaluate an online media clip to support the teaching and learning of oral medication administration for undergraduate student nurses. The research team aimed to test the hypothesis that:

“Access to an on line media clip to augment the clinical skills teaching of oral medication administration in an undergraduate programme of nursing will enhance performance and student satisfaction”
3. **Methodology**

The study was a mixed methods prospective cohort design. Ethical approval was sought and gained from the university’s ethics committee prior to recruitment. A short media clip was produced in collaboration with colleagues from the School of Arts and Creative Industries as a best practice exemplar. The clip followed the model used to demonstrate the procedure during taught clinical skills sessions. The clip was then added on to the online learning content on the module’s virtual learning environment (VLE) for unlimited access by the Intervention Group.

A schematic of the study protocol is offered below:

![Study Protocol Schematic](image)

### 3.1 Participants

Participants were recruited from 2 successive intakes of a 3 year undergraduate programme of nurse education at Edinburgh Napier University during the period between September 2009 and May 2010. Eligibility for study inclusion was determined by enrolment, at first attempt, of a clinical skills based module (Skills for Practice) delivered during the first trimester of Year 1. Information regarding the study was provided face to face during lectures and during taught clinical skills sessions. Printed information sheets outlining the nature and purpose of the study and what participation would involve were provided, and were also available in electronic format through the university’s VLE and email systems. Students’ consent to participate was sought online through the university’s password protected VLE.

Standard deviations from previous studies were not available; therefore a formal power-based calculation could not be undertaken. We therefore aimed to recruit as many participants as possible to attain the largest achievable sample.

Purposive samples from both the control and intervention groups were sought to participate in focus groups. Eligibility for this phase of the study was determined by at least four weeks of clinical placement experience in which the student had participated in oral medication administration. Students who had indicated on their online consent form that they were interested in participating in the focus groups were contacted via email, sent further written information and invited to attend. Written consent for this phase of the study was gained prior to commencement of the focus groups. In total, 5 focus groups were conducted with 16 (n = 8, n = 8) and 20 (n = 10, n = 5, n = 5) participants from the control and intervention groups respectively. This sample size was determined by an aim to achieve a rich data set within a limited time frame which would enable participants to reflect on their teaching experience in light of their concurrent clinical practice.

In all phases of the study participation was voluntary, did not affect module outcome or academic progression and confidentiality was assured.
3.2 Design

Allocation to control (n = 243) or intervention (n = 266) group was determined by intake. The control group consisted of standard teaching content which comprised 3 hours of lecture input, 3 hour skills session and up to 6 hours of lecturer facilitated drop in sessions during assessment preparation. The intervention group had unlimited access to an online video of a best practice exemplar of the oral medication administration process in addition to the standard teaching content. The same lecturing staff delivered the standard teaching input to both groups.

3.3 Outcome measures

Student performance outcomes were tested by the 8 station Objective Structured Clinical Examination (OSCE) which forms part of the summative assessment for the Skills for Practice module. The assessors were experienced examiners who were blinded to group allocation, and the study team were not involved in assessing the administration of oral medication station. Each participant was assessed individually within a 5 minute per station timeframe by an examiner in a clinical skills room using a 10 item marking sheet, under exam conditions. The marking sheet had been developed using up date policy, literature, clinical and professional guidelines and had been subject to expert review and extensive field testing during the assessment of cohorts completing the module previous to the study groups. The marking sheet was reviewed again prior for use within this study, but no amendments or modifications were required. Data in relation to overall OSCE pass rate were gathered, in addition to stratifying each student as a high (all 8 stations passed), medium (7 stations passed) or low (6 stations passed) pass or a fail grade (5 stations or less).

The National Student Satisfaction Survey (Ipsos MORI 2011), with its proven test/retest reliability and internal consistency, was adapted for use within this study. The adapted questionnaire was piloted with both staff and students. Minor amendments were made following feedback from the pilot, with the number of items being reduced from 26 to 21 to avoid a perceived repetition in the questions. A bulleted list of the teaching interventions in relation to the administration of oral medications served as a reminder at the start of the questionnaire, with students then being asked to rate their opinion on the 21 items using a 5 point Likert scale ranging from Strongly Agree to Strongly Disagree or Non Applicable. Two open ended questions also asked the students to highlight any positive and negative aspects of the teaching input in relation to this skill (See Appendix 1). The questionnaire was distributed to the students during timetabled classes in the trimester following completion of the clinical skills module. Due to its anonymous nature, the groups were targeted collectively both in person and via email to encourage completion and return of the questionnaire. Responses to each item for every questionnaire were transcribed into Excel, and responses to the open ended questions were collated and used to inform the questions for the focus group phase of the study.

All data were gathered by one member of the study team and double data entry was utilised to control and correct data entry errors.

3.4 Focus groups

In the context of this research project, focus groups provided the opportunity to illicit a holistic understanding of the students’ views and experiences of the oral medication administration educational input and the subsequent impact on their clinical practice. It was felt that focus groups would encourage interaction between participants, which would then redress the perceived power relationship between the lecturer facilitators and the student participants. Four main areas for exploration were identified from the open ended questions within the student satisfaction questionnaire and from this; semi-structured questions were formulated and used as a guide by the facilitators. The same guide was used for all of the focus groups to enable the generation of a
consistent and rich data set which was relevant to the study outcomes. The research team were aiming to achieve data saturation, but were cognisant that this may not have been possible within the study time frame. Respondent validation was conducted throughout the focus group process with the facilitator summarising their interpretations of the participants responses to each of the four main areas identified within the interview guide. The focus groups were held in meeting rooms on campus, and facilitated by two of the research team who were familiar with the Skills for Practice module but did not deliver teaching content. Each focus group lasted up to an hour, was digitally voice recorded and field notes were taken. The recordings were anonymised and transcribed verbatim.

3.5 Data analysis

Descriptive summary statistics were calculated to allow comparison between the control and intervention groups, including the number and percentages in each group who achieved an overall pass. Additionally, the number and percentage of students achieving a High, Medium and Low level of pass was also calculated. Chi – squared tests for independence were carried out to test for associations between teaching method, pass rate and level of pass. Questionnaire data was analysed using Nonparametric Mann-Whitney U-tests to test for differences in student satisfaction scores between the Control and Intervention groups.

Focus group data was initially proof read individually by 3 members of the research team, and preliminary key phrases were identified. Using inductive thematic analysis, the verbatim transcripts were reread and emerging themes were identified from the data. A number of observational techniques as described by Ryan and Bernard (2003) were utilised including looking for Repetitions, Transitions, Similarities and Differences and Linguistic Connectors to aid this process. In depth discussions were then held to examine the individual interpretations and themes generated, specifically seeking both similar and opposing views resultant from data analysis. Transcripts were re-examined and further discussions enabled the emergence of 2 main categories, their underlying themes and subsequent relationships between them. Focus group data was managed using word processing software (Microsoft Word for Windows 2007) to prevent potential fragmentation and loss of communication processes associated focus group discourse that can be a potential consequence of utilising computer assisted qualitative data analysis software (Bryman 2008).

4. Results

4.1 Assessment results and student satisfaction scores

A total of 322 students consented to allow their OSCE results to be used in the experiment to assess performance; 168 in the Control group (52.2%) and 154 in the Intervention group (47.8%) (Appendix 2).

Table 1 and Figure 2 show the number and percentages of students who gained a fail, low pass, medium pass or high pass in each of the two groups.
The Pearson chi-square test is significant (p = 0.021) providing statistical evidence of an association between group and examination outcome. The percentages of students gaining a medium or high pass are similar for the two groups (32.1% and 16.1% respectively in Control and 33.1% and 18.2% in Intervention). However, 34.5% fail in the Control group compared to only 20.8% in Intervention group, and 17.3% achieve a low pass in the Control group compared to 27.9% in the Intervention group. These results imply that although similar proportions in each of the two groups achieve medium and high passes, the teaching input appears to have more of an effect for ‘borderline’ students, with fewer students failing in the Intervention group.

A total of 235 students completed the Student Satisfaction Questionnaire; 164 students from the Control and 71 from the Intervention group (See Appendix 3).
The median satisfaction scores are as good as or better in the Intervention group compared to the Control. Results from nonparametric Mann-Whitney U-tests provide evidence that 11 of the 21 scores differ between the two groups at the 5% level of significance (i.e. when $p < 0.05$). In each of these questions, students are more satisfied in the Intervention group.

4.2 Focus group findings

The two main categories identified from the focus group data were Classroom Learning and Transfer to Practice.

Classroom Learning

This category encompassed 4 themes of Peers, Self, Teaching and Time. Each of these themes were found to be interdependent, with overlaps clearly demonstrating this symbiotic relationship.

Peers

This theme relates to the students’ perceptions of their peers in relation to clinical skills learning and assessment. Several students spoke of the supportive role of their peers, including providing feedback on their skill performance when this was not available from teaching staff. Some students found working with peers easier as they were less nervous. However, several students questioned their fellow students’ ability and accuracy in providing feedback:

“they (peers) might not be teaching you right and that’s the risk, isn’t it?” [Joe]

The presence of peers was intimidating to some and discouraged them from seeking feedback from teaching staff. In this case, students were reliant on their more confident peers to ask the questions on their behalf. Feedback, therefore, emerged as a key component of the Peer theme.

Further comments indicated that students learn by example and by role modelling their peers. The video was also used for this:

“It was just nice to see someone doing it in front of you and picking up ways of communicating and presenting yourself, I suppose, while administering medication” [Anna]

The importance of peers in the learning process is summarised by James:

“If you were working with someone...whether it was facilitated (by teaching staff)...or not, if you were there with someone else they could read out the criteria while you were doing it. It was all there for you I felt” [James]

Peers appear to replace the need for the teacher in this example, and are a comparable resource for learning when the “criteria” for an expert performance are made visible. Not all peers offer this type of learning opportunity; “it generally depends on who you are working with and how the help you” [Sam]. Another key component emerging from the data analysis is, therefore, is motivation and how this influences clinical skill development. This is further discussed in the next theme.

Self
This theme relates to the role of self in the learning of clinical skills. Aspects of self were discussed by the participants. Being motivated and taking ownership was perceived as necessary for successful learning to take place. This was perceived to be independent of teaching method or amount:

“take it upon yourself to go and make yourself sure, you have been given every opportunity for the person to learn the skill but it is up to them” [Paul]

A growing awareness of the responsibility and seriousness associated with medicine administration was revealed as the students discussed their learning experience and satisfaction and relief when they “get it right” [Sam]:

“I think that it is a massive responsibility but I think it is a bit worrying as well. But you do get a lot of satisfaction when you complete a drugs round and everyone’s got what they should have” [Emma]

Interestingly, the video helped to instil this awareness in the students:

“when we went into the practical class, it was...wearing uniforms and the video and it was all quite serious and it was taken quite seriously” [Graeme]

Students spoke of “practicing by myself was beneficial” [Heather], as it allowed them to engage in self assessment and feedback to “highlight where your strengths and weaknesses are” [Mary]. Some students, however, were reticent in trusting their own perceptions of their performance, expressing concern that they “could have been making the same mistake for 3 weeks but you wouldn’t know” [Fiona]. This is where the video was particularly useful to refer to for guidance during self directed study:

“the online video was a good idea because it gives you a kind of reference point...if you have got a video it is kind of like following by example” [Irene]

This self perception went beyond the performance of the skill, with students also speaking of their self perceived confidence in relation to the administration of medicines:

“I am fine with the administration process, I know exactly how to do that” [Rachel]
“I feel really confident about it now” [Alex]

Teaching

There was much discussion about the teaching and learning experience. One key area was how real the experience was and how it related to current practice:

“I thought that it was pretty accurate of how it is on placement, I found that it (the teaching) was pretty useful” [Chris]

The learning environment had an effect on this and little things like wearing uniform helped the students to enter into simulated practice:

“the video was very useful to let you see what would happen and put your mind at ease” [Alice]

The demonstration of the skill as a whole in context appeared to promote the realism and therefore relevance of the teaching for the video group:
“it maybe flows better and you can see the relevance to certain parts of it and that helped to make it, make more sense. So that was certainly useful, the video” [Elliot]

In contrast there was much discussion in the control group about “going through stages you have learned...” [Charlie], indicating that the students saw the skill as a series of steps:

“you just went through them and you hoped that you’d done everything right” [Charlie]

Without the video the clinical skills teaching appears to be de-contextualised and fragmented to the students and results in an uncertainty of their capability. In addition the growing awareness of the seriousness and responsibility of the administration of medicines discussed in relation to the Self theme was not evident in the Control group. This appeared to be resultant from the perception that the skill was simplistic and “it doesn’t seem that difficult to do a sort of step by step” [Lily]:

“It’s just a tablet, you know, you just pop it in and that’s it”[Aimee]

The students in the Control group repeatedly spoke of a perceived lack of consistency in teaching:

“there was a lot of discrepancies between how the groups had been taught, the lecture itself was quite thorough but the actual skills class itself there was a lot of discrepancies, a lot of things missed off” [Shannon]

This perceived inconsistency was viewed very negatively by the students as they questioned “why were you taught this, and why were we taught that?” [Aimee]. Students recognised that “there should be a uniform way to teach things” [Elisa] otherwise “it meant that you were at a disadvantage” [Heather]. In direct contrast this concern was not highlighted by the Intervention focus groups, suggesting that the video has the ability to address these issues.

The students looked for and appreciated feedback from teaching staff:

“The fact that you could ask questions of the lecturer, was one of the things I found useful” [Tara]

and found that the video also provided this by providing an example for good practice to measure their performance against. Overall the video was considered a very positive aspect of the teaching input:

“I thought that the video for the administration bit was excellent and the teaching was great too” [Elaine]

Time

Time was also a topic that threaded throughout the discussions. This related to “the time constraints of a class and the skills lab where the lecturers only got x amount of time to devote to you” [Aimee] Time available with the lecturers to practice the skill was seen as beneficial and promoted learning and students spoke of a desire to have “more time with the lecturer...they will generally give you more time and give you a rationale why it is like that and I found it much more helpful” [Lily].

Although the Intervention group were positive about the video, this was not valued above time with the lecturer as “the reality is that people would rather have face to face teaching, especially for topics such as that” [Gillian]
They also discussed the timing of the teaching sessions in relation to the assessment, whereby a significant gap between teaching input and OSCE was perceived as a disadvantage. In this instance the video provided a useful revision tool:

“by the time you actually came round to do the OSCE it’s nice to look and actually see it being done and help you memorise it” [Elaine]

However some students experienced technical difficulties in accessing the video and this was perceived as being particularly problematic when it was during assessment preparation time:

“I couldn’t open the video...I mean I would have quite liked to have seen it before my OSCE exam and tried quite a few times” [Hannah]

Classroom Learning

Each theme was found to be closely related, and overlaps were present. When all of the themes were well addressed, successful Classroom Learning took place:

“I am fine with the administration process, I know exactly how to do that...what the drug is for, why am I giving it to the patient”[Rachel]

which prepared the student well for their clinical practice:

“the preparation that we got with regards to the oral medication I felt really comfortable going into a ward or care home and being able to dispense based on the lecture that we got, the drop ins and all the teaching we had” [Louise]

The video appeared to positively influence several of the themes within this category, enhancing the overall Classroom Learning experience.

Transfer to Practice

Students spoke of a development of their classroom learning once they had been out in practice. The students in the Intervention group saw their classroom learning as having prepared them well for practice:

“I have learned a lot about the ward placement and about the procedure of the administration of medications, so it (clinical practice) is just really practice of what we were taught in the first trimester” [Elaine]

Interestingly, the Control group did not link their Classroom Learning with their clinical practice to the same extent or describe the same relationship between the two. They did acknowledge the input of the teaching, but saw taught content being separate from “your practice experience, which will be different” [Charlie]. The perception that the clinical practice “will be different” [Charlie] was evident in both groups, but the manifestation of this perception was different. This influenced how the students saw the clinical skills teaching they received. The Control group perceived this to be preparation and training for their assessment:

“It was more just the robotic get through it (the OSCE). I need to pass this, learn it for the purposes of that. And then actually learn it from there”[Stuart]
The teaching was seen as “good in terms of the OSCEs but I didn’t think it was in practice” [Heather], and once they were in practice they would “actually learn it from there” [Stuart]. In contrast, the Intervention group saw their teaching input as preparing them with:

“the basics so you are familiar with the kardex, you know the non touch rule, expiry date, date of birth confirmation and stuff like that” [Gillian]

The Intervention group described their learning as a set of principles which they would adapt once out on clinical placement. Students spoke of their teaching as having “stayed in there as a pattern that you have adapted as you go along, so it has been useful” [Susan].

In relation to this category, the video appeared to enhance the usefulness and relevance of the taught content, enabling Classroom Learning to better Transition to Practice.

5. Discussion

This study aimed to evaluate the use of an online best practice exemplar as an adjunct to the clinical skills teaching of oral medication administration to undergraduate student nurses through quantitative and qualitative outcomes. The findings support the use of an online video to augment face to face clinical skills teaching sessions to enhance not only assessment results, but also the student experience and overall satisfaction.

The administration of medication is a strong feature of modern health care, and one which is inherently linked to the patient safety agenda (Scottish Executive Health Department 2006, Scottish Patient Safety Programme 2007). Concern is centred on two key areas; safe prescribing practice and medicines management. With the former generally associated with the role of the medical practitioner, the area of medicines management which includes the administration process is internationally recognised as a domain of the nurse’s role. It has been estimated that up to 40% of a nurses time is spent administering medications (Council of Europe Expert Group on Safe Medication Practices 2006), however despite this error rates as high as 47.5% have been reported (Armitage and Knapman 2003). There are more opportunities for error during medication administration than any other part of the process, with nearly half of clinical incidents involving drug errors being reported at this stage (National Patient Safety Agency 2009). Findings from a UK based study identified that of these errors, 3 – 5.5% were linked to the administration of medication by the oral route (Ho, Dean and Barber 1997). It is therefore essential that higher education institutions play their part in helping to meet this international patient safety objective by effectively educating nursing students in this vital part of their role.

Early work by Latter et al (2000) evaluating the educational preparation of nurses in providing medication education highlighted that there was a lack of opportunity within curricula to integrate the knowledge and skills required for this role. Although the authors did not look at medication administration as a standalone skill, a key finding was the importance attributed to learning which was applicable and relevant to practice in relation to the medication role. Simulation is recommended as a way of providing students opportunities which allow for the integration of taught classroom content to clinical practice. With limited opportunities for practice affecting the skill fluency of students (Dyjur, Rankin and Lane 2011), it appears that augmenting clinical skills teaching with online video may provide an educational solution to these problems identified by previous authors. This is supported by findings from the current study through the emergence of Transfer to Practice as one of the two key Categories from qualitative data analysis, in addition to the statistical (p=0.006) improvement in self rated confidence levels of students in tackling the skill of the administration of medicines. Pre-registration nursing students from Hemingway, Stephenson and
Allmark’s (2011) mixed methods study rated “practical” teaching methods the highest when asked about their experiences of medicines management training, with direct observation of the administration process being ranked second highest as the preferred clinical skills learning strategy amongst the student sample. This positive evaluation of direct observation is congruent with the findings from the current study, whereby an improvement of both the student performance of the administration of medicines was achieved, alongside a statistically significant improvement in satisfaction with the teaching strategy through the availability of unlimited opportunity to observe the skill. Interestingly, Hemingway, Stephenson and Allmark’s (2011) sample rated computer simulation as the least preferred method of teaching and learning medicines management, however this finding is more representative of how the simulation was used rather than a reflection of the potential benefits of using computer technology for this purpose.

It is recognised within the literature that using the internet in collaboration with clinical instruction can be successfully used to support self-directed clinical learning (Baier 2001). Indeed, Chaffin and Maddux (2004) commend nurse educators who incorporate computer technology within their teaching as it allows for students to develop skills not only in the taught content, but with using information technology affectively; a skill recognised as being essential for today’s nurse to be competent in supporting their work and in empowering and supporting patients (Bond 2009).

Several authors have looked at using web based teaching to deliver clinical skills instruction. Salyers (2007) compared classroom to web based instruction using interactive videos, instructional media and reading materials. It was found that although the web based instruction group performed better in terms of final assessments of theoretical and practical skill acquisition, the student satisfaction scores were lower. Although this finding appears in direct contrast to the results from this study, it must be noted that Salyers’ (2007) web based instruction group did not receive any lectures with teaching staff, therefore missing out on the benefits of the student - staff interaction highlighted in the Classroom Learning Category.

Bloomfield, While and Roberts’ (2008) systematic review aimed to report on available research investigating computer assisted learning specifically for use in the clinical skills education of nurses. Of the 12 included studies, only 2 were identified which examined the skill of medication administration (Jeffries 2001, Schneider et al 2006). Of these studies, both demonstrated a development in the learners’ cognitive and applied knowledge of the skill, however neither study gave the students unlimited access to the educational resource. The current study, therefore, has addressed gaps in the current literature base by utilising online clinical instruction in a unique, evidence based way to produce strong evidence to support the study hypothesis that:

“Access to an on line media clip to augment the clinical skills teaching of oral medication administration in an undergraduate programme of nursing will enhance performance and student satisfaction”

6. Future research

Recommendations for future research are summarised below:

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Rationale</th>
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<tbody>
<tr>
<td>Online video as a teaching adjunct to taught clinical skills sessions should be evaluated in other settings and professions</td>
<td>To examine whether the findings from the current study are transferable to a wider range of contexts and professional groups</td>
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<tr>
<td>Follow up work with the research sample as they progress through their undergraduate programme to registration</td>
<td>To examine if the findings from the current study are consistent over time</td>
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</table>
Future evaluations of teaching interventions for clinical skills should incorporate larger sample sizes and control groups

The sample sizes in current studies are restricted, thereby limiting the extrapolation of findings to this population. Researchers should aim to recruit sample sizes large enough to enable statistical inferences. The majority of currently available evaluations lack Controls, thereby limiting the strength of evidence.

7. Dissemination

The findings of the project have been presented at the Scottish Clinical Skills Network annual conference in St Andrews in September 2011. The project has been submitted for presentation at the international Nurse Education Today and Nurse Education in Practice (NETNEP) annual conference 2012. The project is currently being written up for publication in the International Journal of Nursing Research for international dissemination.

8. Research workers

No changes were made to the research team outlined in the Proposal. Statistical support for the project team was provided Dr Kay Penny (Lecturer) School of Management, Edinburgh Napier University.

9. Financial summary

<table>
<thead>
<tr>
<th>Row Labels</th>
<th>Sum of Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff costs</td>
<td>629.90</td>
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<tr>
<td>Quantitative data analysis</td>
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<tr>
<td>• Statistician</td>
<td>719.75</td>
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<tr>
<td>Other costs</td>
<td>497.93</td>
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<tr>
<td>Transcription costs</td>
<td>516.67</td>
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<tr>
<td>Income to date</td>
<td>-2536</td>
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<tr>
<td><strong>Grand Total</strong></td>
<td><strong>-171.75</strong></td>
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| Summary                           |               |
| Salary payments                   | 1866.32       |
| Other costs                       | 497.93        |
| **Total spend**                   | 2364.25       |
| **Income to date**                | **-2536**     |
| **Current balance**               | **-171.75**   |

**Costs still to be charged:**

• **Video production** 1305
10. References


Appendix 1

Student Satisfaction Questionnaire

During your Skills for Practice module, one of the skills you were taught and learned about was the Administration of Medicines. This input consisted of:

- Administration of Medicines – Part 1 (Lecture)
- Administration of Medicines – Part 2 (Lecture)
- Administration of Medicines – Skills session
- Administration of Medicines – Video of procedure used both in class and available on WebCT
- Lecturer facilitated OSCE drop-in sessions where Administration of Medicines could be practiced.

You were then assessed on the Administration of Medicines in Station 2 of your OSCE.

Thinking of your experience of both the teaching and assessment of the clinical skill of Administration of Medicines, please rate your experience below.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Definitely agree</th>
<th>Mostly agree</th>
<th>Neither agree or disagree</th>
<th>Mostly disagree</th>
<th>Definitely disagree</th>
<th>Not applicable</th>
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<tbody>
<tr>
<td>1. Staff were good at explaining things</td>
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<td>3. Staff were enthusiastic about what they were teaching</td>
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<td>4. The criteria used in marking was made clear in advance</td>
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<td>5. Assessment arrangements and marking have been fair</td>
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<td>6. Feedback on my performance has been prompt</td>
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<td>7. Feedback on my performance has helped me clarify things that I did not understand</td>
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<td>8. I received sufficient advice and support with my studies</td>
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<td>9. The teaching was well organised and running smoothly</td>
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<td>10. The resources were good enough for my needs</td>
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<td>11. I was able to access general IT resources when I needed to</td>
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<td>12. I was able to access specialised equipment, facilities and rooms when I needed to</td>
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<td>13. Learning materials made available have enhanced my learning</td>
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<td>14. The range and balance of approaches to teaching have helped me to learn</td>
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<td>15. The delivery of the teaching has been stimulating</td>
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</tr>
<tr>
<td>16. My learning has benefited from teaching that is informed by current research</td>
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<td></td>
</tr>
<tr>
<td>17. Practical activities as part of the teaching have helped me to learn</td>
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</tr>
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<td>18. The teaching has helped me to present myself with confidence</td>
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<td>19. My communication skills have improved</td>
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<td>20. As a result of the teaching, I feel confident in tackling the administration of medicines</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>21. Overall, I am satisfied with the quality of teaching in relation to the administration of medicines</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Thinking back on the experience, are there any particularly positive or negative aspects you would like to highlight?

Appendix 2

Participant summary
### Appendix 3

**Student satisfaction scores for each Group, highlighting cores which differ at the 5% level of significance**

<table>
<thead>
<tr>
<th>Core</th>
<th>Control group</th>
<th>Intervention group</th>
<th>Mann-Whitney test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Staff were good at explaining things</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.011</td>
</tr>
<tr>
<td>2. Staff made the subject interesting</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.074</td>
</tr>
<tr>
<td>3. Staff were enthusiastic about what they were teaching</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.105</td>
</tr>
<tr>
<td>4. The criteria used in marking was made clear in advance</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.068</td>
</tr>
<tr>
<td>5. Assessment arrangements and marking have been fair</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.136</td>
</tr>
<tr>
<td>6. Feedback on my performance has been prompt</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.001</td>
</tr>
<tr>
<td>7. Feedback on my performance has helped me clarify things that I did not understand</td>
<td>4 (3, 5)</td>
<td>4 (4, 5)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>8. I received sufficient advice and support with my studies</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.012</td>
</tr>
<tr>
<td>9. The teaching was well organised and running smoothly</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.066</td>
</tr>
<tr>
<td>10. The resources were good enough for my needs</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.556</td>
</tr>
<tr>
<td>11. I was able to access general IT resources when I needed to</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.849</td>
</tr>
<tr>
<td>12. I was able to access specialised equipment, facilities and rooms when I needed to</td>
<td>4 (3, 5)</td>
<td>4 (3, 5)</td>
<td>0.984</td>
</tr>
<tr>
<td>13. Learning materials made available have enhanced my learning</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.149</td>
</tr>
<tr>
<td>14. The range and balance of approaches to teaching have helped me to learn</td>
<td>4 (4, 4)</td>
<td>4 (4, 5)</td>
<td>0.001</td>
</tr>
<tr>
<td>15. The delivery of the teaching has been stimulating</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.036</td>
</tr>
<tr>
<td>16. My learning has benefitted from teaching that is informed by current research</td>
<td>4 (4, 5)</td>
<td>4 (4, 5)</td>
<td>0.057</td>
</tr>
<tr>
<td>17. Practical activities as part of the teaching have helped me to learn</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.028</td>
</tr>
<tr>
<td>18. The teaching has helped me to present myself with confidence</td>
<td>4 (3, 5)</td>
<td>5 (4, 5)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>19. My communication skills have improved</td>
<td>4 (3, 5)</td>
<td>5 (4, 5)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>20. As a result of the teaching, I feel confident in tackling the administration of medicines</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.006</td>
</tr>
<tr>
<td>21. Overall, I am satisfied with the quality of teaching in relation to the administration of medicines.</td>
<td>4 (4, 5)</td>
<td>5 (4, 5)</td>
<td>0.003</td>
</tr>
</tbody>
</table>