Evaluation of an Online Screen-based Simulation Initiative in the Adult Child Midwifery Department

EXECUTIVE SUMMARY

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Acknowledgements

Executive summary

In April 2020 the adult child midwifery (ACM) department at Middlesex University started using online screen-based simulation (OSBS) software sourced from Oxford Medical Simulation[1] (OMS). This OSBS initiative was not a response to the COVID-19 pandemic but was seen as way of managing some of the barriers to teaching clinical assessment skills which the pandemic created.

The evaluation of this OSBS initiative was commissioned by the ACM department in April 2020 and data collection was carried out between June and September 2020.

The OSBS initiative had the following learning objectives for 3rd Year (adult and children and young people) nursing students who were to go into practice earlier than anticipated (through an opt in 'extended placement') because of the increased need for staff as a result of the COVID-19 pandemic:

- develop knowledge and understanding of the physical assessment of an acutely unwell patient and reflect on their practice.
- develop the technical and non-technical skills required when assessing and intervening with the acutely unwell patient and reflect on their practice.
- To upskill current third year adult and children and young people nursing students to prepare them for being deployed as a result of the COVID-19 pandemic.

The OSBS initiative was also aimed at adult and children and young people third year nursing students who did not opt for the 'extended placement' (i.e. those continued with the 'normal' pattern of their course as far as the circumstances allowed) and with adult and children and young people second year students; mental health nursing students (2nd and 3rd year); nursing associates (2nd year); third year midwifery students and PG Dip 2nd year students. For these groups there were slightly different learning objectives:

- Enable healthcare students to develop knowledge and understanding of the physical assessment of the acutely unwell patient.
- Enable healthcare students to develop technical and non-technical skills required when assessing and intervening with the acutely unwell patient.

The evaluation objectives were to assess the extent to which these learning objectives are met as well as increase understanding of the experience of students in using the platform (e.g. perceived useability of the platform, satisfaction with the platform and support webinars which were provided for students, barriers to use, things which were most and least useful, things which were viewed as needing improvement or change) and the view and experiences of staff who are involved in teaching via the platform or supporting that teaching.

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[1] See http://oxfordmedicalsimulation.com

Evaluation approach and methodology

A realistic evaluation approach was used which was carried out through a mixed methods research design which incorporated an online survey and online focus groups with students who had participated in the OSBS initiative as well as an online focus group with staff. Relevant secondary data (such as the number of times students participated in each scenario), which was available via the OMS system, was also analysed.

Online survey results

The response rate to the online survey was 25% (617 students invited, 154 wholly or partially completed questionnaires obtained). 13 students took part across two online focus groups. Seven members of staff took part in an online focus group and one took part in a one to one interview (as they had been unable to attend the focus group).

Sample profile

Just over half of respondents (51%) were adult nursing 2nd or 3rd year students, around one fifth (20.5%) were Trainee Nurse Associates; 13.6% were mental health students 2nd or 3rd year students and the same proportion were child and young people nursing 2nd or 3rd year students.

Participation in OSBS initiative

Students were requested to participate in five scenarios and the median number of scenarios participated in was five and only 20 students had participated in more than that. Respondents were asked which scenario they had last participated in The scenarios most frequently cited were Melaine Anaphylaxis (27.4%), Melanie Acute Severe Asthma (22.6%); Maria, Acute Anxiety (14.5%) and James (Non-accidental Injury) and Wilfred, Urosepsis & Delirium (each on 9.7%). Users of these five scenarios accounted for nearly 84% of all responses.

Attitudes to OSBS scenarios

Respondents were very positive (mean ratings above four on a scale of 1 to 5) about the last scenario participated in, on a range of measures including realism, usefulness and overall satisfaction. Items with lower ratings related to access to peer and staff support but this is likely to be because many did not require such support (responses on other questions suggest high satisfaction with staff support). It is also possible that some students did not understand what is meant by 'peer support'. There were no statistically significant differences in attitudes to scenario by learning style, programme or year, nor between scenarios. 59% thought the scenario duration was 'about right' but a large minority (39.3%) thought it was too short. Less than 2% of respondents felt that the scenarios were too long.

Webinars and self-guided reflection

The OSBS initiative included regular webinars (post-scenario) where students could come together (online) to discuss their experiences of taking part in the initiative and receive support from staff and peer

learning/support. Take up off webinars was low (Just 14.5% of respondents said that they had accessed the webinar associated with the last scenario they participated in) but the fact that just under half of respondents (49.1%) were not sure/did not know if they had accessed the webinar suggests that many students were not sure what was being referred to by the term 'webinar'. There were very positive attitudes to webinars amongst those who did use them (n=16).

There was evidence of the use of the self-guided reflection (post-scenario) and some evidence that students found it useful. However it seemed clear that students would be much more likely to use, and benefit from, the self-guided refection if it was more embedded in the programme (e.g. if there was an expectation that the self-guided reflection would be discussed with teaching staff and/or mentor).

Perceptions of skills gained
A very large majority of respondents felt that they had gained skills in making clinical decisions based on their observations and prior knowledge; escalating issues to senior members of staff and using time effectively across different activities.

Perceptions of learning objectives achieved
Most student respondents felt that they had achieved a range of learning objectives/outcomes including understanding of handover, physical assessment and interventions in the treatment of acutely unwell patents and clinical decision-making. There were no statistically significant differences by year of programme (although 3rd year students tended to get slightly higher mean scores on these questions than 2nd year students) and few differences by programme.

Barriers to participation in OSBS initiative
Most student respondents did not consider that they were experiencing major barriers to participation in the OSBS initiative. Most potential barriers listed in the questionnaire received a similar rating (between 2.31 and 2.83) indicating that they were between 'something of a barrier' or 'not a barrier at all' but it should be taken into account that students who had tried the scenarios only very briefly or had been put off trying them at all, for whatever reason, would be much less likely to take part in the survey so the data may underestimate the significance of some of these barriers. The items which were most likely to be considered a barrier were 'difficulty in installing the software or logging in' which was the biggest barrier (something of a barrier or significant barrier for 52.9%) followed by feeling stressed due to COVID-19 lockdown and not having enough time to do the scenarios.

There were no statistically significant differences in perceived barriers to participation by scenario, age, learning style, programme or year of programme, but men were statistically significantly more likely to experience 'having to compete with other members of the household for internet access or use of a device'

as a barrier than women (focus group data suggested that this was also a problem for women with school age children who had to share devices with those children so that they could do their homework).

Most and least useful aspects of scenarios and things to be improved

Student respondents were asked (in an open-ended survey question) to identify which aspects of the scenarios they had found most and least useful and things which could be improved. The aspects of the scenario (which students had last participated in) which respondents found most useful were improving clinical assessment skills; the realism of the scenario and learning about liaising with team members (especially delegating or escalating). The aspects of the scenario (which they last participated in) which respondents found least useful were the (perceived) short duration of the scenarios, technical problems (e.g. freezing/crashing) and aspects of usability around menu/mouse interaction with the scenarios.

Focus group findings

Three online focus groups were carried out – two with students and one with staff. The themes which were common to both staff and student focus groups were 'feedback assessment and support for students', 'realism of the scenarios' and 'peer support/learning'. These are briefly described below.

Feedback, assessment and support for students

Staff drew attention to the fact that the marking criteria/algorithm of the OMS software was not transparent and in a small number of instances the learning activities in the scenario did not map onto competencies which are required for pre-registration nursing in the UK, making the software unsuitable for purposes of summative assessment, although an extremely useful supplement to more didactic teaching formats. Staff explained that students had support available for participating in the OSBS initiative from a number of sources - they could contact the skills team directly for technical support, participate in webinars after each scenario and had access to pastoral support via their personal and professional development tutor (PPDT) whose role was to ensure that they had completed the scenarios and give them pastoral support if needed or to refer them to other sources of clinical or technical support which they might need.

Students were generally satisfied with the automated feedback which they got within the scenario although there were a small number of instances where it was felt that the feedback was unclear. Students generally felt they had been able to get technical support from staff when needed but many seemed unaware of the support which they could access in the form of post-scenario webinars.

Realism

Generally speaking, staff considered the scenarios had a high degree of realism in terms of reflecting situations which nurses might have to deal with although some also felt that, while the scenarios did allow some multitasking, this was still rather linear in nature. Students felt that the scenarios were very realistic and had given them a real sense of what it was to be a nurse, particularly in terms of the professional

responsibilities and making decisions under pressure. However, many students felt that the scenarios were too short in duration, which might detract from the realism.

Peer support/learning

The platform does not have any built-in support for peer communication, learning or support. Staff were of course aware that OSBS creates limitations or challenges for students to support and learn from each other, as they might do in 'classroom' situations. It also limits what things staff can do to facilitate peer learning. There was some evidence that students were supporting each other informally, through various online channels (email, social media), with technical advice about downloading or installing the software or exchanging notes regarding aspects of scenarios which they found challenging. Students perhaps did not fully realise the value or potential of peer learning so might be unaware that it was hard to access this type of support while using the platform remotely.

Conclusion

The OSBS initiative project objectives were (in relation to 3rd year students who opted for 'extended placement'):

- develop knowledge and understanding of the physical assessment of an acutely unwell patient and reflect on their practice.
- develop their technical and non-technical skills required when assessing and intervening with the acutely unwell patient and reflect on their practice.

There is strong evidence of the OSBS initiative objectives having been met (in relation to 3rd year students in general) which comes from survey evidence regarding which skills students perceived they had gained which could be transferred into practice and learning outcomes or objectives they felt they had achieved, and this is supported by focus group evidence.

There was some evidence from student focus groups that the self-guided reflection tool which the skills team created, to be used by students after completing scenarios, was being used by some students but there was limited evidence regarding the use of self-reflection generally.

The OSBS initiative also aimed to achieve some specific learning objectives in relation to 3rd year students who did not opt in to extended placements and adult and children and young people second year students; mental health nursing students (2nd and 3rd year); nursing associates (2nd year); third year midwifery students and PG Dip 2nd year students. These were to:

- Enable health care students to develop knowledge and understanding of the physical assessment of the acutely unwell patient.
- Enable health care students to develop technical and non-technical skills required when assessing and intervening with the acutely unwell patient.

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Again, survey and focus group evidence suggests that students felt they had achieved the learning objectives in these areas and furthermore on most survey items which were tested, there were no statistically significant differences by year which suggests that 2nd and 3rd years were experiencing these benefits from the OSBS initiative to a similar extent.

Recommendations

In this section some recommendations are made, based on the evidence gathered and the conclusions reached. It is recognised that the use of OSBS in the ACM department at Middlesex is still at a relatively early stage, and that there are limitations of the evaluation data. Therefore these recommendations are framed as ideas for consideration and to inform discussion.

- It may be useful to discuss with the platform developers what other scenarios are available, which ones may be in development, and whether there is any potential to commission or influence particular scenarios

- It may be useful for staff to review whether the duration of the scenarios is appropriate and if so, whether students need any particular preparation or support in relation to the stress which some may experience in the scenarios.

- It may be useful to have a plan to address barriers to student participation in the OSBS initiative. Overall, the top three barriers to student participation (based on survey evidence) were: difficulty in installing the software or logging in, feeling stressed because of living under lockdown (hopefully a temporary factor) and not feeling confident about using IT.

- Take up of the OSBS initiative should be monitored by programme, year and possibly demographic characteristics to make sure that no segments of the student population are being disadvantaged or inadvertently excluded.

- An assessment should be made of the suitability of existing Middlesex University laptops for use in OSBS initiatives in order to inform future procurement of laptops for students in the department (ACM) since it is likely that most will be using the current platform or some other simulation software in the future but that many laptops were apparently struggling to cope with the processor/memory demands of the current platform.

- Staff may wish to consider what training/support may be needed for staff who do not feel confident about using OSBS as part of their teaching. The evaluation was not able to directly obtain the views of staff who did not engage with OSBS so further research or consultation may be needed with staff about this.

- It might be useful to consider how student demand for OSBS (which seems strong) will be met and what resources that may be needed to achieve that (e.g. staff time, equipment, licenses).How OSBS is integrated into the curriculum is a closely related issue and it may be useful to consult with staff and students on the detail of this.

- Students may be losing important aspects of peer support when working remotely .Therefore, some consideration may be needed as to how peer support in relation to OSBS can be facilitated (other than in post-scenario webinars and noticeboards). Students might be encouraged to share and discuss their self-guided reflections with each other as a way of strengthening peer learning support around OSBS.

- It is important that teaching staff are explicit with students about intended learning outcomes (e.g. regarding their decision-making/clinical assessment and that they should view the simulation as part of a suite of related learning activities e.g. webinars and perhaps the self-reflective exercise). Awareness/take up of webinars associated with each scenario seemed to be low. The webinars (currently offered post-scenario) seem a very valuable way to consolidate learning and are also an opportunity for peer learning and support in relation to the OSBS initiative. Therefore it would seem important to increase awareness of the webinars and the benefits of participation.

- The system data which is available at the 'back end' of the OMS platform (i.e. that which is available to staff or system administrators) seems to be very limited in some important respects (e.g. it does not seem possible to generate reports/metrics at individual student level. This data could potentially be very useful for understanding individual student learning. Therefore, perhaps this is something that can be discussed with the developers of the platform in the context of a 'wish list' of improvements to inform future development.

- Finally, it may be useful for staff to consider how the OSBS initiative relates to other educational technology which the ACM department uses such as the anatomy and physiology mannequin and the Lucine and 'Super Tori' midwifery mannequins and whether it is possible or even desirable to have a single strategy that encompasses all simulation and virtual reality facilities, across all programmes in the ACM department.

OMS – the user experience - by Josh Sharman

Online Screen Based Simulation (OSBS) has been utilised by Middlesex University to teach many of the skills required by student nurses to achieve registration. The software evaluated for this project is Oxford Medical Simulation (OMS) which was originally designed to be used with virtual reality hardware and delivered in the classroom setting. However, due to COVID-19 restrictions the delivery of the programme was remote and online only i.e. students participated in these simulations on their own computers, and mostly at home.

This simulation platform places students into a virtual ward or single bedded area, students are then able to control their environment and interact with the surrounding equipment as in clinical practice. There is a usually a support worker present in the room who the student can interact and communicate with. Each of the simulations features a patient presenting with a specific medical condition with certain scenarios also involving patients presenting with a variety of social or psychological issues. The student is then required to undertake a clinical assessment of that patient, using their clinical knowledge to draw conclusions and make decisions regarding patient care within a safe environment.

Students have a total of 20 minutes to carry out the assessment and make decisions regarding the required care. Students are able to see the time remaining in the simulation on a clock behind the patient. As the environment is interactive, students are required to speak with the multidisciplinary team regarding care, such as the prescribing of required medications or make an assessment on the requirement for existing prescribed medications based on a comprehensive A-E assessment.
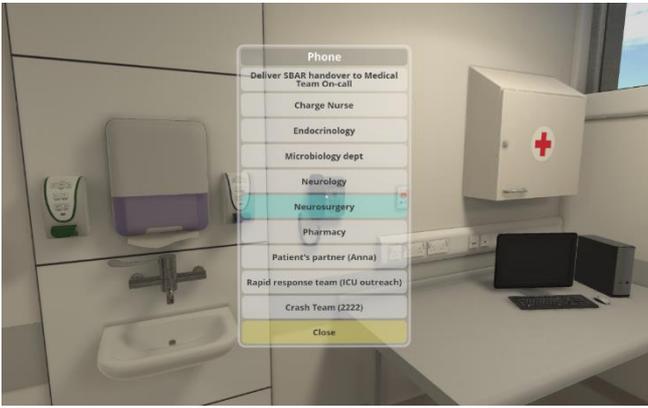
Students should carry out a systematic A-E assessment and the support worker is able to provide prompts when required. As in clinical practice there is an expectation that the student documents their clinical findings following information obtained in the clinical assessment. Vital signs are displayed on a virtual cardiac monitor and are documented on electronic patient records. This information can be accessed if required for re-assessment. Aspects of clinical assessment should also be obtained from communicating with the patient.

Following the completion of the simulation, the student is taken to an area of self-directed reflection where they are asked how they feel they performed and what areas can be focused on for improvement in the future. Following a period of reflection, the student will be presented with a score of their overall performance and a detailed breakdown of actions they performed correctly and areas which they can improve on in the future. Each of the actions

has a link to clinical guidance or further reading to embed clinical guidance and also provide references for further reading.

Students can repeat the same simulation and also apply learned knowledge from these simulations in further simulations that they undertake with the same system.
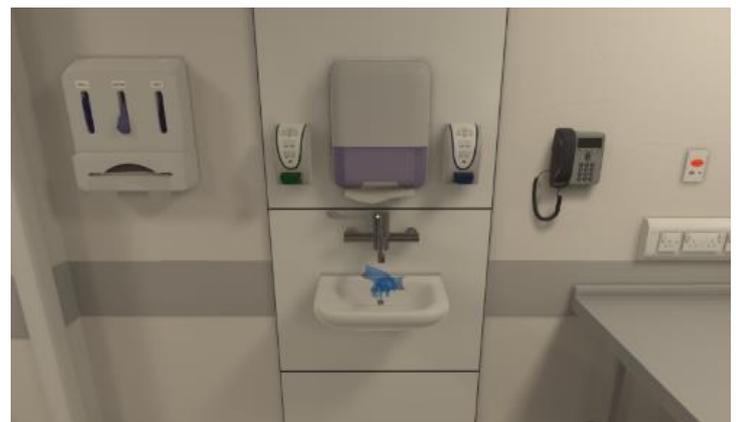
1   Appendix 3 - Glossary

Some of the key terms used in this report are defined below.

Term	Definition	Notes
Extended placement	During the peak of the COVID-19 infection in the UK, special arrangements were made for healthcare students, which meant that they either opted-in to extended paid placements or temporarily moved into theory-only education.	Council of Deans of Health (2020) https://www.rcot.co.uk/file/7176/download?token=NtEx1dwC
OMS	Oxford Medical Simulation	A provider of simulation software focussed on education of health professionals. **See** https://oxfordmedicalsimulation.com/
OSBS	Online screen-based learning	Learning taking place online and where the interaction is mainly through a conventional two dimensional screen (as distinct from virtual reality or augmented reality).
OSBS initiative	The project in the Adult Child Midwifery department in the school of Health and Education at Middlesex University which is the subject of this evaluation	The initiative included the introduction of OMS and a framework of teaching and support around that, including webinars , self-guided reflection and dedicated support from staff regarding technical issues or other barriers to participation that the students might encounter.
PPDT	Personal and professional development tutor	
Scenario	A simulated healthcare 'episode' involving interaction between the students and virtual patients and colleagues	
Self guided reflection	A process that encourages students to reflect on personal experience of a learning activity in order to gain insight into their performance	
Webinar	a seminar conducted online	In the OSBS initiative, students were offered a dedicated webinar for each scenario which they took part in.