



Evaluation of a Health Education England Simulation Initiative in the Department of Adult Child Midwifery

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1 Executive summary

The HEE SIMS project

This report presents the findings from an evaluation of a Health Education England (HEE) funded project to develop and deliver simulated learning to students at Middlesex University. Simulation is “an educational method which uses a variety of modalities to support students in developing their knowledge, behaviours and skills, with the opportunity for repetition, feedback, evaluation and reflection to achieve their programme outcomes and be confirmed as capable of safe and effective practice.” (NMC, 2023)

The evaluation of the HEE SIMS project was commissioned by the Adult Child Midwifery department at Middlesex University in late 2022 and the vast majority of the data collection was carried out in March 2023, with first-year nursing students who took part in a week of simulation activities, online and in a dedicated simulation suite ('SIMS week') at the StoneX campus in North London and the staff who were responsible for planning and delivering the activities during the week. The evaluation objectives were to assess the extent to which the stated project objectives were met as well as to increase understanding of the experience of students and staff in designing and using simulation scenarios (a simulated healthcare 'episode' involving interaction between the students and virtual patients and colleagues) and associated online activities provided as part of a SIMS week at the StoneX campus. The evaluation also aimed to make recommendations which would inform the further development of SIMS at Middlesex.

Evaluation design, methodology and data collection

A realistic evaluation approach was used (Pawson and Tilley, 1997) which was carried out through a mixed methods research design incorporating an online survey (pre and post SIMS week), non-participant observations of staff and students during SIMS week and the debriefing sessions which involved staff and students. The evaluation also included focus groups with students who had participated in SIMS week (pre and post) as well as an online focus group with staff (pre and post SIMS week).

FINDINGS

The main findings are described below.

Survey findings

There were 35 survey responses (18 pre-SIMS week and 17 post-SIMS week). All respondents were first-year nursing students. Overall, 57% (n=16) of respondents were mental health (MH) students, 28.6% (n=6) adult students and 14.3% (n=4) children and young people students (CYP). Half of the respondents (n=14) were 44 or under and half (n=14) were 45-55. The sample was therefore quite mature in terms of age. At least 57.1% (n=16) of survey respondents were female (a further 11.4%, n=4 chose 'other' but most of those gave responses indicating that they were female); 21.4% (n=6) were male with one respondent identifying as 'non-binary'.

Although the survey did not ask about ethnic or cultural background it seemed, from student focus group responses, that the vast majority of students who participated in the SIMS week evaluation were of Black British or Black African ethnicity/background and this was confirmed in demographic data which the department holds. This data also showed that there was considerable demographic variation by speciality in terms of age, gender and ethnicity. This may have implications for the way in which students in different specialism experience SIMS (e.g. the relationship between age and IT proficiency might impact particularly on online days which requires a reasonable level of IT skills and familiarity with online apps).

Accessing SIMS remotely/from home: Most students did not experience significant barriers to participation in SIMS from home. However, just over a quarter considered that not having a quiet/comfortable environment at home was something of a barrier/significant barrier. Just under 17% felt that issues with broadband/internet were something of a barrier/significant barrier and the same proportion thought that their lack of/poor IT skills or lack of confidence in its skills were something of a barrier/significant barrier. Lack of access to devices or competing with other members of the household for devices was something of a barrier/significant barrier for 25% of respondents.

Participating in SIMS on campus (StoneX)

The perceived barriers to participation were fewer in relation to participation on campus as compared to remote participation; less than 10% of students experienced any barriers to participation in relation to the items mentioned in the questionnaire.

Satisfaction with the SIMS week was extremely high. Nearly all respondents were fairly or extremely satisfied on all aspects of the SIMS week but satisfaction with the remote/online activities was a little lower than for days at the StoneX campus. The proportion who were 'extremely satisfied' was highest in relation to support from staff and the overall experience (83.3% in each case) and lowest with regard to realism of scenarios (those without actors).

Student confidence increased from pre to post SIMS week on nearly all aspects which were asked about (e.g. a 26.7% increase on 'your overall confidence as a student nurse', from 73.3% to 100% being fairly or extremely confident). This is consistent with what students said they had wanted to get from SIMS week (increased confidence, especially in practice and increased skills). Although the percentage changes from pre to post on many items was large, the pre-post differences were not statistically significant and this is likely to be because of the small sample sizes, which gave low statistical power to the tests (i.e. it is difficult to detect an 'effect' when there is a small sample size).

The realism and duration of scenarios was rated highly (i.e. the scenarios were seen as being very realistic and seen as being of appropriate length).

OBSERVATIONS of staff and students

Non-participant observations of staff and students were carried out on all five day of SIMS week by experienced researchers, using a semi-structured observation schedule. Some of the key findings from the observations were:

- Across a range simulated scenarios, students could immerse themselves into a situation where they could explore their feelings, absorb knowledge and practice skills they may encounter within clinical practice.
- The blend of online and face-to-face learning over the week of the pilot appeared to the observers to lend itself to integrating learning and lecturers continually reinforced the learning themes from day one across the online and face-to-face learning modes.
- The simulations, both online and face-to-face, evoked emotional reactions from the students which were observed and recorded by the observer, increasing the experiential benefit of simulation.
- Debriefing explicitly allowed lecturers to focus on feelings experienced in learning (and thereby integrate learning) and encouraged students to process their emotions from the experiences. The debriefing sessions themselves drew on prior learning about reflective practice elsewhere in the curriculum and students were adept at reflecting on their learning. Lecturers appeared skilled facilitators of learning through emotions. The debrief following the scenario allowed the reworking of theory in practice
- Peer learning in both online and face-to-face simulated scenarios was observed by the researchers. Students processed information together, problem-solved in pairs or small groups, came to shared decisions and led their peers where there was uncertainty in both technical and non-technical skills. Students drew on existing knowledge and understanding by working through scenarios within timed frameworks supervised safely by skilled expert teachers.
- The manikins and actors appeared to increase the fidelity of the simulation.

There was some evidence of digital inequity. Although all students are entitled to borrow a laptop from the university, it was not clear what percentage had taken advantage of that entitlement and therefore not all students had access to laptops. Some students participated in the online days through their phones which caused difficulty for some in accessing the course materials or activities.

Student focus groups

Focus groups were held with students on day two of SIMS week (their first day on campus at StoneX) and towards the end of the final day. 12 students attended the former and seven students attended the latter. The main themes which emerged from the student focus groups were:

- **Barriers to participation in SIMS week** included accessibility of the StoneX campus, cost of travel and the fact that SIMS week was occurring very close to a coursework deadline. Some of these issues

were not mentioned in the questionnaire so it was useful that they were picked up in the focus groups, albeit that the travel /accessibility issues may be hard to address.

- **Attitudes to online activities** Most students valued online learning but some did not see their relevance/value and there were issues for a few with being distracted at home or by other tasks, issues with internet or device access. Some students felt that the instructions for online activities should be clearer and that there was a lack of engagement of students in the online activities.
- **Realism of the scenarios** was considered to be high, but much more so in relation to actor-based scenarios in face-to-face settings. Scenarios were seen as having some advantages over placements (e.g. the ability to practice rare scenarios, having a safe learning environment and having better teaching/learning support and much greater opportunity for reflection/feedback).
- **Skills or procedures** Students described acquiring or improving skills such as basic measurements, blood pressure, cannula care/removal of cannula, handovers, injection technique, observations, sliding sheets, urine test, vital signs. More generally, escalation was an aspect of some scenarios which helped students learn when to refer to more senior staff for advice or support.
- **Impact or change over the week** The main changes noted by students over the SIMS week were:
 - Confidence increased generally
 - Confidence increased in relation to future placements
 - SIMS week was generally experienced as an intense and sometimes exhausting experience but one which was very rewarding – the balance of on campus and remote working is important and (possibly) one day off is needed during the week.

Further research would be needed to determine whether the SIMS week experience will result in longer term change (impact) as this evaluation did involve follow students into their placements.

Staff Focus Groups

An online focus group was carried out with staff just before the start of the SIMS week and again a few days after the end of SIMS week. Six staff attended each focus group. The main themes are described below.

- **Aims and objectives of the SIMS project:** Staff were clear that the university's main motivation for making the application to HEE and developing the scenarios was to replace some placement hours with simulation. This replacement was seen as being necessary for variety of reasons including the difficulty of getting placements and the perceived deterioration in the quality of the NHS learning environment due to the staffing crises and a variety of other factors such as more rapid turnover of patients (shorter hospital stays).
- **Importance of realism:** Staff were aware of the importance of realism in SIMS and that scenarios involving actors were more realistic than those just involving manikins, even if both were of value. It

was noted that the scenarios with actors were more conducive to reflection as the actors could give detailed feedback about how they had felt in the role of the patient.

- **Pressure on staff:** Organising the SIMS weeks involved a great deal of work for staff, especially the clinical skills team. This was in terms of deciding the details of the scenarios and mapping learning outcomes onto them and physical aspects of organising, installing and managing the equipment and actors at StoneX, delivering the scenarios and activities to students and administering the students' participation.
- **Training needs of staff:** Some staff had limited previous experience of SIMS, some had specific training but in any case most were on a very steep learning curve. Staff explained that training for SIMS can be expensive and was not always easy to source.
- **Pedagogy:** Staff did not have an explicit or single pedagogical approach but generally aligned themselves to constructivist approaches and placed great value on reflective learning, briefing sessions and teaching in small groups.
- **Safe learning environment:** SIMS was seen as a safe learning environment in which students could feel free to make mistakes, without consequences; this was repeatedly stressed by staff.
- **NHS as a learning environment:** Staff were aware of weaknesses/gaps in the NHS learning environment due to staff shortages and faster 'turnaround' of patients amongst other things.
- **Outcome/impact of the project:** Staff perceived that SIMS week had:
 - Greatly increased student confidence and helped students link theory and practice
 - Increased students' clinical skills (especially handover, injection techniques escalation etc)
 - Improved student decision-making
 - Potentially improved student retention and possibly also improving staff retention, post-registration
- **Integration of SIMS into the pre-registration programme:** Some staff considered that they were ready to roll out SIMS in the main programme from September 2023 but were also aware of considerable barriers and work remaining to be done. Some barriers to the integration of SIMS into programmes were identified (cost of training, staff time cost of actors, electricity and other running costs at StoneX and low tariffs from HEE).
- **Staff see further expansion of SIMS is seen as 'the way to go'** and they were aware that it is used more widely in other countries than in the U.K.

Lessons learned (staff): Staff identified a number of things which they considered as "lessons learned".

- The scheduling of SIMS week should be more sensitive to coursework deadlines (the first-year students had a coursework deadline on the Monday after the end of the SIMS week).
- The first day of a SIMS week should be face to face, to allow students and staff to get to know each other and build up a rapport (the first day was online which made it a little difficult for students to establish rapport with each other and staff; this was a barrier to interaction in online activities).

- Staff felt that the balance of online days and on campus days was felt to be about right (two of the former, three of the latter) although some staff thought that students would prefer five days on campus. Staff felt that this was unaffordable in terms of staff time.
- Some staff identified that there was a need for improved consultation and communication with students about which students should attend and that the week was compulsory for those students who were chosen.
- Many staff recognised the value of learning/across fields of study in SIMS week.

Prebriefing sessions

Prebriefing sessions of around 30 minutes were the start of each day's activities. These sessions recapped on the previous day and laid out the programme for the coming day. Many students joined the prebriefing late (perhaps exacerbated by public transport strikes during SIMS week) and perhaps it was not viewed by students as a full part of the days teaching or activities per se, as it should have been.

Debriefing Sessions

The teaching staff (clinical skills team) carried out debriefing sessions with students at the end of each day of SIMS week. The researchers observed two debriefing sessions on the last day of SIMS week, lasting an hour each. The themes from analysis of these sessions are described below:

- **Realism of the scenarios:** The students were clear that the realism was high and was greatly enhanced when actors were in the scenarios as opposed to manikins, although both offered degrees of realism.
- **What students will take into practice:** increased confidence was by far the aspect which students most frequently mentioned in terms of what they think they will take into practice. This was especially in relation to handovers, injection technique, better organisational skills, improved communication skills with patients and their families and being sensitive to what patients may overhear. Students also expressed greater confidence in knowing when to escalate, developing a more holistic perspective and a greater willingness to 'question everything'.

Discussion

The findings tend to confirm those of published literature in that simulation is effective but that high-fidelity simulations including life-like manikins and actors are more realistic and are valued more highly by students. The findings also tend to confirm literature which shows that simulated experiences provide opportunities for learning as students are required to integrate knowledge learned in other parts of the curriculum (lectures for example) to practice situations and skills and through the practice of skills and the importance of debriefing. There are some important gaps in the literature which mean that some aspects of simulation have not been rigorously researched (e.g. its long term 'impact').

Limitations

The number of students invited to participate in SIMS week was relatively small (n=45) and not all of those participated in the various parts of the evaluation. It also seemed that participation in the evaluation was quite unbalanced by branch/specialty with a disproportionately large number of participants from mental health (MH) and relatively few participants from adult or CYP (children and young people) in some parts of the evaluation. It is not clear if this was because there was unequal participation in the SIMS week (by branch/specialty) or whether some specialties were less likely to participate in the evaluation. The small sample size made it difficult to detect statistically significant effects from 'pre' to 'post' so that although there were large percentage increases in aspects such as confidence, these were not statistically significant so we cannot be sure that the differences did not occur by chance. However, the qualitative evidence from focus groups, observations and debriefing sessions suggest very strongly that there was real and positive change during SIMS week and it is likely that had the sample been larger, statistically significant effects would have been found.

The evaluation design did not allow for following students into placements or into practice, post registration, so it is not clear whether the changes which occurred over SIMS week will translate into longer term sustained change (impact). The evaluation design did not include a control group (i.e. a group of students who did not experience SIMS week) to compare with the SIMS week group on outcome measures (this would be very difficult, given the need to make sure that all students are offered the same opportunities).

The evaluation only looked at the experiences of first-year students. It is possible that these students are more likely to benefit from SIMS week than students from years two or three who have already had several placement experiences and are obviously further along on their preparation generally. The evaluation might therefore tend to over-estimate the benefits of SIMS week.

Notwithstanding all of the above, the evaluation research design was a sophisticated and rigorous mixed methods design which allowed for a very in-depth and nuanced evaluation and the gathering of very rich insight into the experiences of staff and students during SIMS week and we hope that it will be helpful in informing the progress of SIMS aspects of the pre-registration programmes.

Conclusion

There is considerable evidence of progress towards most of the stated objectives during SIMS week. There is strong evidence from all data sources that students found SIMS week to be a safe learning environment and that they were immersed in the scenarios. Survey, focus group and observation data provide strong evidence that students improved their clinical skills, and their confidence generally across SIMS week and there was some evidence that decision-making skills were also developed. Observations show strong evidence that emotions and feelings were present in learning in the scenarios and the debriefing sessions were effective in encouraging exploration of feelings, emotions and learning. The observations of the

debriefing sessions suggests that these were successfully used to encourage and facilitate links between theory and practice.

Recommendations

- a) On the whole, students clearly enjoyed SIMS week and felt that they got a lot from it in terms of skills, learning outcomes and confidence and that was also the view of most staff. However based on observation data it seemed that there was a need to improve the instructions to students during online teaching sessions before students go into breakout groups and for more supervision by a staff member to ensure that students are actively participating in the breakout groups, that they understand the activities and to underline the importance of students having their cameras switched on, even if it was not possible to insist on this.
- b) Related to the above point, it may be worth reviewing the extent to which students are made aware of the need to assist and support each other's learning (i.e. peer learning) and the extent to which this can assist student learning especially in the online days of the SIMS week.
- c) It may also be useful to review potential barriers to student participation in future delivery of SIMS. Although the majority of students did not experience any barriers to participation to a significant extent there were some barriers for a minority of students. For the online days these related to the lack of a quiet/comfortable environment at home, poor quality/low speed internet, lack of IT skills or access to devices or having to compete with other members of the household for access to a device. There was some evidence of digital inequity and other barriers such as the timing of SIMS week in relation to impending coursework deadlines and the difficulty and expense of travel to StoneX for some students.
- d) The current 'offer' to students is one week of SIMS in each year of their programme. It is clear that students who took part in SIMS week would like to use it more and demand will continue to grow. It perhaps also raises issues of whether staff will be able to cope with the level of pressure in SIMS week when there are fewer staff per student and less opportunity to take weeks away from this work to recuperate.
- e) A related issue is the extent to which SIMS week will remain effective when delivered with fewer staff per student than was the case during the evaluation and whether it might become less satisfactory to students generally. The internal evaluation used by the teaching staff may be able to pick up any decline in satisfaction from students and clearly this data should be reviewed periodically, perhaps with external support on the data analysis if needed.
- f) The department may wish to consider what further training/support is needed for staff and whether they would wish to have an explicit strategy around this in terms of which staff need to have what particular

training. Staff may also wish to consider if there is an adequate 'pipeline' of staff coming through who can support the SIMS work, to support likely future expansion.

- g) It might be useful to consult with staff and students on the detail of how SIMS can or should be further integrated into the curriculum (i.e. which modules, or specialties which learning outcomes or objectives are intended and how these will be assessed).
- h) Although most staff instinctively aligned themselves with constructivist approaches and that the scenarios and learning activities were being designed with clear learning outcomes in mind, perhaps time did not always allow for a deep consideration of the pedagogical approach or options or how these integrate with the pedagogical approaches used to underpin the curriculum generally. It may be that staff would wish to consider if this is something which they need to address or not.
- i) It may be useful for staff to consider how the SIMS week relates to other educational technology which the ACM uses such as the Oxford Medical Simulation (OMS) software which is currently only available to 3rd year students, and whether it is possible or desirable to have a single strategy that encompasses all simulation and virtual reality facilities, across all programmes in ACM.
- j) It is recommended that when external evaluations are taking place (such as the one reported here) that any internal evaluations such as regular feedback surveys which staff carry out with students should be suspended to avoid students feeling 'over researched' which could lead to low participation in all forms of evaluation or lower quality responses. Data provided from an independent external evaluation will usually be of higher value than data from informal internal evaluations and it is unhelpful to run both at the same time.
- k) There is very wide divergence in the demographic profile of students, by specialty. Departmental data shows that MH students are far more likely than adult or CYP to be of Black African or Black Caribbean ethnicity, to be male and the average age of MH students is twice that of CYP students. It is unclear what implications there may be for SIMS but, for instance, the inverse correlation between age and IT skills still persists at a national level and might mean that students in some specialties require more support or preparation for the online days. It is important that future evaluations collect data on the ethnicity of students along with other basic demographic data such as age and gender.

2 Introduction

In 2022 the Department of Adult Child and Midwifery (ACM) at Middlesex University was successful in an application for HEE funding to develop up to ten simulations (scenarios) to be delivered to pre-registration nursing students. As part of the piloting of the project, these scenarios were delivered to students in programme cohorts as a full week of blended learning¹ at the Middlesex University campus at StoneX which has been newly equipped for delivering simulation. The evaluation only covered the final SIMS week, which was for first-year students (SIMS week for second and third year students had been held in the preceding weeks). The stated aims/objectives of SIMS week are shown below.

a)	To discover whether within a simulated safe learning environment using different scenarios, students can immerse themselves into a situation where they can explore their feelings, absorb knowledge and practice skills which they may encounter within clinical practice.
b)	Students have a simulated base learning period within a simulated environment (online and in the skills centre) to enhance nursing skills and develop decision-making skills.
c)	Students will be able to explore their feelings about situations they may encounter within clinical practice through scenario-based learning.
d)	Through reflection and peer learning within the simulated ward, students will demonstrate their understanding of how technical and non-technical skills impact on how they deliver care and interact with people.
e)	Students will be able to reveal their knowledge and understanding by working through scenarios in a timely manner.
f)	The debrief following the scenario will encourage the application of theory to practice learning and ensure students have demonstrated the correct technical skills and their ability to escalate and handover appropriately in the scenario.

45 first-year students were invited to take part in SIMS week (15 each from MH, adult and CYP). Selection was not based on particular criteria but there was a desire to have equal representation from across nursing specialisms. Participation in SIMS week was mandatory for the selected students (although it was not a formal part of the curriculum) but participation in the evaluation was voluntary. The evaluation of the HEE SIMS project was commissioned by the ACM department in Autumn 2022. Ethical permission was obtained from the Middlesex University Health and Social Care Ethics Sub-committee on 3rd March 2023 (MOREFORM reference application 2500) and data collection commenced shortly afterwards.

Table 1: SIMS week schedule

SIMS week schedule for Year 1 Nursing students – March 2023

Time	Monday (<i>Online</i>)	Tuesday (<i>in person</i>)	Wednesday (Online)	Thursday (in person)	Friday (in person)
09.00	Introduction to the simulation week Padlet: Preparation for practice A student self-guided interactive way of working through clinical based scenarios and creating peer teaching and reflection.	Nursing Olympics Interactive game in which students separated into groups will need to correctly perform ten simulated practice stations to enable them to finish.	Padlet: Patient Assessment A student self-guided interactive way of working through clinical based scenarios and creating peer teaching and reflection.	Simulated Ward Students will have the opportunity to work through ward based clinical scenarios in a simulated safe environment	Simulated Ward Students will have the opportunity to work through ward based clinical scenarios in a simulated safe environment
09.30					
10.00					
10.30					
11.00					
Coffee Break 15 minutes					
11.20	Padlet continued	Nursing Olympics	Padlet continued	Simulated Ward continued	Simulated Ward continued
12.00					

Time	Monday (<i>Online</i>)	Tuesday (<i>in person</i>)	Wednesday (<i>Online</i>)	Thursday (<i>in person</i>)	Friday (<i>in person</i>)
	Facilitator will debrief the students using PEARLS debriefing tool	Facilitator will debrief the students using PEARLS debriefing tool	Facilitator will debrief the students using PEARLS debriefing tool		
Lunch Break 60 minutes					
13.00	Basic Care Videos	Forum Theatre	Community online appointment	Skill Practice	Skill Practice
13.30	Students will watch simulated practice videos and engage in discussions about caring for patients involving personal care, moving and handling and nursing values.	Students will see a real time communication scenario and will need to correct as needed to get a better outcome	Students will conduct a videocall with service users to explore and give advice on healthy lifestyle.	Students will be given the opportunity to explore and practice further any skills they have identified during the simulation that need further development.	Students will be given the opportunity to explore and practice further any skills they have identified during the simulation that need further development.
14.00					
Break 15 minutes					
14.30	Basic Care	Forum theatre	Community online appointment	Guided Debrief	Guided Debrief
15.00	Videos continued				

Time	Monday (<i>Online</i>)	Tuesday (<i>in person</i>)	Wednesday (<i>Online</i>)	Thursday (<i>in person</i>)	Friday (<i>in person</i>)
15.30	Facilitator will debrief the students using PEARLS debriefing tool	Students will see a real time communication scenario and will need to correct as needed to get a better outcome	Facilitator will debrief the students using PEARLS debriefing tool	With the help of the actor and technicians, the facilitator will debrief the students in a different room using PEARLS debriefing tool	With the help of the actor and technicians, the facilitator will debrief the students in a different room using PEARLS debriefing tool
16.00					

2.1 Evaluation objectives

The evaluation objectives were to assess the extent to which the learning objectives were met as well as increasing understanding of the staff and student experience in SIMS week (e.g. perceived usability, relevance, realism of scenarios), satisfaction with support from staff, peer learning and SIMS week overall, barriers to participation, things which were most and least useful to staff and students, and aspects of SIMS week which were viewed as needing improvement or change). The evaluation also sought to identify useful learning from this to inform the future development of SIMS.

2.2 Literature review

Health systems have had to think critically about how and where healthcare students learn (Gutierrez et al., 2007; MacGaghie et al., 2010; Cook et al., 2011; Haerling, 2018) for a number of reasons:

- The increasing complexity of healthcare (both in terms of complex patient morbidities and newly emerging potential treatment/intervention pathways) (Kingston et al., 2018);
- The need to maximise patient safety (West et al, 2009);
- High level of bed occupancy (NICE, 2018) and high patient acuity in the NHS measured as care hours per patient day (CHPPD) (NHS, 2021);¹
- The numbers of NHS nursing vacancies in England alone is 47,000 and is projected to rise further (Nursing Times 2022).
- Constraints on time for learning in clinical practice and the availability of supervisors and assessors in clinical practice (Cook et al., 2011; Johnson et al, 2015; Groothuizen et al, 2019; Whaley et al., 2023).

These trends have led to challenges in managing capacity in pre-registration clinical placements (Murray & Williamson, 2009; Eick et al., 2012; Keeping-Burke et al., 2020). The findings from this evaluation should be seen in the light of this challenging context.

2.2.1 Learning in the workplace

In order for full engagement in learning to occur for the student, workplace learning needs to be fully situated in three ways:

- In practical activity;
- In the culture and context of the workplace learning environment;

¹ CHPPD has since become the principal measure of nursing, midwifery and healthcare support staff deployment on inpatient wards. It has now expanded to include all ward-based clinical professionals who are budgeted to the ward establishment and rostered into the 24/7 roster (NHS, 2021).

- In the socio-biographical features of the learner's life (Evans et al., 2006).

Solomon et al. (2006) argue that the term 'workplace learning' in nursing, and healthcare more broadly, has particular meanings and practices because of its location in (work) places external to an educational institution where learning may not be the primary focus. It cannot be assumed that learning in the workplace will take place without structure and support or that learners will necessarily be signposted to learning or be able to identify learning opportunities. Melia (2000) argued that, while nurse educators often assume that the NHS is a learning organisation, in fact the NHS is primarily focused on patient care or, in a neoliberal conception, patient throughput (Davies et al., 2005; Rudge, 2015). Perhaps as importantly, while the NHS may not be formally focused on learning, neither does it attend sufficiently to the informal learning which occurs in the workplace for learners. Nursing students learn poor practice from informal learning opportunities as well as good practice (Bockarie, 2002; Allan et al., 2008; Groothuizen et al., 2019).

A distinguishing feature of workplace learning in the NHS is its embodied nature (Allan et al., 2018). Other features of the learning are: a) the busy and emotional nature of the work with a lack of time to debrief either about the emotions which may shape that experience or any possible learning from that emotional experience; b) the lack of learning experiences in workplaces with a high number of students to accommodate in busy workplaces with overstretched staff and a lack of supervision. The busyness, the lack of staff to foster learning and the pressure on work placements can lead to poor horizontal and vertical learning where students struggle to put knowledge to work through a lack of opportunity (Groothuizen et al., 2019).

2.2.2 Learning theory in nurse education

Theory to inform teaching methods or pedagogy in nurse education was largely influenced by Vygotsky, Eraut and Dewey and many nurse teachers would probably refer to either social learning theory, situated learning theory (SLT), role modelling or even constructivism. What these have in common is a view of learning as a social process that is enhanced within the real environment (as described above). However traditional learning approaches in nursing education (from early 20th century to 1970s) were highly structured, didactic and purposeful and based on behaviourism (rote learning with rewards), then empiricism with a nod to constructivism emerging in the 1990s. Early nursing theories were developed largely from within the natural science paradigm, later psychology and ethics of care (Allan & Evans, 2022). This paradigm remains popular in the contemporary world, not just the academic (Jackson and Barnett, 2020). The nursing diagnosis and the evidence-based theory movements in nursing in the 1990s are further examples of an empiricist tradition in nursing.

Current models of teaching in nursing education talk about *applying* theory in or to practice. Nursing professional programmes and curricula expect students to graduate as critical, active learners who work at

level 6. To achieve this, the curriculum (across university and clinical placements) needs to provide learning opportunities which allow students to develop active learning and integrate both theoretical and practical forms of knowledge. Student nurses are required, like medical and other healthcare students, to integrate knowledge across university and different clinical placements.

Theories of learning in non-healthcare sectors have moved away from the idea of applying theory in practice (Evans et al. 2009). Their arguments are that students (learners) rework knowledge for practice across different settings whether they are engineers, nurses or teachers. Nurses, like other healthcare professionals, are life-long, agentic learners who re-work knowledge in and through local practice (Allan & Evans, 2022).

2.2.3 Learning approaches in nursing curricula

Learning approaches which facilitate active learners and produce critical and reflective graduates who deliver person-centred care need to be based on valuing of active learning and respect for patients. Other approaches that can work well here are: problem and inquiry-based learning activities, discovery or self-exploration activities or processes, technology-enhanced role simulations, case-centred instruction, and model scenario training (Pivac et al., 2021; Soares et al., 2021; Wagstaff et al., 2023) and of course, embodied approaches to learning (Repetto et al, 2018).

2.2.4 Simulation based education (SBE)

The Nursing and Midwifery Council (NMC), the regulatory body for nursing and midwifery professional preparation programmes, define simulated learning as:

“An educational method which uses a variety of modalities to support students in developing their knowledge, behaviours and skills, with the opportunity for repetition, feedback, evaluation and reflection to achieve their programme outcomes and be confirmed as capable of safe and effective practice.”
(NMC, 2023).

McGaghie et al. (2010, 50) conclude in their literature review (using qualitative synthesis) that:

“the development of and research into SBME [simulation based medical education] have grown and matured over the past 40 years on substantive and methodological grounds. We believe the impact and educational utility of SBME are likely to increase in the future. More thematic programmes of research are needed. Simulation-based medical education is a complex service intervention that needs to be planned and practised with attention to organisational contexts.”

There are a number of literature reviews in the field spanning 20 years of SBE which support their conclusions. These include: McGaghie et al. (2010), Yuan et al. (2012), Foronda et al. (2013).

Simulation has been used in undergraduate nursing education in a focused manner for nearly 30 years. Simulation-based education (SBE) is a specialised teaching method very different from methods taught in other parts of the nursing curriculum (Foronda & Bauman, 2013) which complements traditional teaching methods (McGaughey & Traynor, 2010). While there is some debate (Waxman et al., 2019), we agree with Erlam et al. (2017) that SBE is not a pedagogy, it is an *“immersive teaching/learning platform which is a representation of a functioning system or process”* (2017, 779). Its effectiveness in improving clinical reasoning and critical thinking is not certain if overall instructional design principles do not reflect suitable philosophical paradigms. Erlam et al. emphasise that *“Simulation as a teaching/learning platform is maximized when instructional design includes the inspiration of behaviourism, cognitivism, and constructivism”* (2017, 779).

Simulation has been described as providing mock experiences (Wellard et al, 2007) which may have low to high-fidelity (closer to real life experience). The degree of fidelity is important in debates around the design and use of simulated learning in nursing (McGaughey & Traynor, 2007; Aebbersold et al., 2018). If SBE is successful in promoting learning (and emotional learning is an integral part of learning), it will stimulate emotions (Makowski et al., 2017; Hamza et al., 2022).

These emotional responses to situations and scenarios in SBE need to be recognised and processed, usually in debriefing. A lack of psychological safety in learning in SBE can detract from learning (Hamza et al., 2022). Hamza and colleagues argue that the affective component of SBE learning has not been given sufficient attention in the literature as do Makowski et al. (2017). Madsgaard et al. (2021) argue that educators should examine and seek to stimulate, where appropriate, a wide range of emotions as part of SBE such as curiosity, interest and confusion. In our view, emotions have not been given sufficient attention in nursing education in general (Allan, 2016).

Equipment may utilise highly sophisticated clinical simulation from laboratories or suites to more modest equipment; it can include gaming, (Buttussi et al., 2013²; Farra et al., 2015; Gautier et al., 2016; Malicki et al., 2020); augmented reality (AR); avatars in multiplayer virtual worlds (MVW) (Creutzfeldt et al., 2016). High-fidelity 3D equipment will include life-like manikins with computer programmes which permit for

² Examples include: Malicki et al.'s literature review of gamification in nursing (2017); Buttussi et al.'s (2013) study into 3D serious game as a learning strategy for scenario-based advanced life support skills (ALS) training; Farra et al.'s (2015) study into virtual reality training for disaster management; Gautier et al.'s (2016) development of a Serious Game for Handling Obstetrical Emergencies;

example, changes in cardiovascular state; other forms may include actors (this is common in advanced communication training, [Sweeny et al., 2021]); computer and internet programmes or interactive remote learning; and virtual reality simulation. High-fidelity SBE is relatively expensive in terms of equipment, facilities and teaching time (Aebbersold & Tschannen, 2013; Haerling, 2018). The latter study found no difference in outcomes between manikins and virtual simulation conditions in a quasi-experimental study of nursing students which simulated care of a hospitalized patient experiencing a chronic obstructive pulmonary disease exacerbation. Rourke (2020) compared AR simulation with SBE in the acquisition of clinical psychomotor skills for pre-registration student nurses and suggests that further research is needed. Rourke (2020, 5) concludes that:

“the results are generally favourable for virtual reality, variation in devices, data collection tools and outcome measurements mean that caution must be used in their interpretation. Outcomes relating to psychomotor skill performance support the use of virtual reality as an educational intervention. Time taken to undertake and complete the skill is questioned as a valid outcome measurement due to the potential to forgo skill accuracy in favour of speed.”

Simulated experiences (including AR) provide opportunities for learning as students are required to integrate knowledge³ learnt in other parts of the curriculum (lectures for example) to practice situations and skills and through the practice of skills (Koukourikios et al. 2021). It is highly experiential where experiences are designed for specifically constructed environments (Koukourikios et al, 2021). Koukourikios et al. (2021) found in their review that SBE provided a protected environment and sense of security which enhances students' self-esteem and confidence. These experiences aim to represent authenticity using high-fidelity (mirroring real-life) in ways that situate the learning experience to and for real-life clinical practice (Bauman, 2012). While online SBE has shown potential for improved student learning (see below for more detail) and potential reduction in costs for providers, a significant requirement for SBE and AR is students' self-regulation in learning (Edelbring & Wahlstrom, 2016). In other words, students' motivation to learn in autonomous learning structures is key. SBE requires the relationship between student autonomy, flexibility of learning resources, and teacher guidance be acknowledged, planned for and evaluated. An increased awareness and understanding of this relationship is needed to support students' learning (Alexander et al., 1998; Hartley & Bendixen, 2001). The use of follow-up activities such as different forms of peer and teacher feedback seems to enhance the value of virtual patient learning activities.

³ Throughout this report we avoid using terms such as 'transfer' or 'application' of knowledge. We base our work on that of Evans et al., (2004; 2009; 2010) and Allan & Evans (2022) who suggest that students actively learn through the reworking or recontextualization of knowledge across different learning contexts.

Table 2: The types of skills which may be covered in simulated learning include

Psychomotor skills performance	Predicting	Teamwork
Social skills	Critical thinking	Medication administration
Collaboration/communication	Problem solving	Prioritisation
Information seeking	Cognitive knowledge (nursing)	Decision-making
Reasoning	Creativity	Assessment

(Sportsman et al. 2011):

2.2.5 SBE and learning

Traditionally, clinical psychomotor skills (blood pressure observations, heart rate monitoring, insertion of cannula and catheters) are taught by videos or demonstration by teaching staff on low-fidelity manikins (Aebersold et al., 2018). These teaching methods do not allow for visualisation of internal structures (organs) and anatomical landmarks. AR combines virtual with physical reality and feedback to make simulations even more realistic and results in significantly improved skills transfer in students (Bowman et al., 2009; Kilmon et al., 2010; Barsom et al., 2016; Aebersold et al., 2018). High-fidelity SBE may contribute significantly to student nurses' professional preparation (McGaughey & Traynor, 2010). It provides the opportunity to practice skills in a safe risk-free environment in a repetitive, planned, deliberative and structured way (Aebersold, 2016).

Foronda et al.'s (2013) integrative review found that students expressed satisfaction with simulation irrespective of their learning style although senior students reported lower satisfaction with simulation. While the studies reviewed suggested that simulation increased self-efficacy and self-confidence, there were some indications that senior students overrated their self-assessed knowledge and skills performance before simulation (Cardoza & Hood, 2012) and that senior students scored lower on self-confidence measures compared to junior students (Schlaret 2011). Foronda et al. conclude that the evidence about whether stress and/or anxiety interferes with learning in simulations is inconclusive. While most students experience stress and anxiety during simulations, this may be balanced by the learning acquired. Cantrell et al. (2017) carried out an integrative review of evidence about the stress that nursing students experience during high-fidelity simulation. Students tended to report moderate or high stress but valued simulation as a learning strategy which seems consistent with the findings of Foronda et al. Clearly students would also experience stress in placements, if encountering situations equivalent to the simulations, and perhaps that is part of the reason why students are prepared to accept the stress of simulation in return for effective learning in an environment which is 'safer' than clinical placements.

Yuan et al. (2012), in a systematic review, argue that the evidence on the level of fidelity required to produce meaningful learning experiences is inconclusive. Their review concluded that simulation led to knowledge and skills acquisition and might be equated with clinical practice learning. Communication, teamwork, role awareness and professional identity were noted as particular skills which were enhanced in simulations. Interdisciplinary simulated learning was seen to a positive experience by students for knowledge and skills acquisition. Foronda et al. (2013) also argue that evidence regarding the optimal fidelity level for simulation (low, medium, high) is inconclusive. Randomised controlled trials of high-fidelity simulation in nurse education (such as that of Lasocki et al. 2015 which found that high-fidelity simulation for nurse training reduces unplanned interruption of continuous veno-venous hemofiltration sessions in critically ill patients) are relatively rare.

Evidence from recent studies supports the use of simulation-based learning in addition to technology-enhanced simulation as a way to supplement learning for procedural training and to develop clinical reasoning, which could offer a less costly solution (Cant & Cooper, 2014; Haerling, 2018). SBE has been acknowledged to offer flexibility to universities and other providers as offering “increasingly more accessible and affordable to students, faculty, and researchers” (Bauman, 2016, 111). McIntosh (2022) found that simulation can be effective in developing ‘career resilience’ in nursing students potentially making them less likely to become dissatisfied post-registration and to leave the profession.

Pedagogical underpinnings of SBE

There is relatively little discussion in the literature about the pedagogical implications of SBE. There is considerable debate and conflicting perspectives around the pedagogical basis of SBE with some viewing it as a distinct pedagogy and others being equally clear (as touched on earlier) that it is not a pedagogy in itself (e.g. Erlam 2017) but rather viewing an educational technology or set of technologies which must therefore draw on a number of pedagogical or learning theories including constructivism and behaviourism. Others (e.g. Waxman et al. 2019) do view SBE as a pedagogical approach, one which ‘disrupts’ traditional nurse education models and forces a re-examination of assumptions such as the supremacy of learning in clinical settings. Stayt (2012) says:

“there is a philosophical conflict between the different learning approaches required to meet all the expected learning outcomes”.

There is also very little discussion or evidence in the literature about how SBE should be integrated into a pre-registration curriculum with most research focussing on the acquisition of particular skills rather than how SBE interacts with other parts of a programme, including clinical placements. Another area where there is relatively little research is barriers to participation in SBE – e.g. how students may experience SBE

differentially based on socio-demographic factors such as age, gender, ethnicity, socio-economic background or family circumstances, all of which may all be dimensions or drivers of digital inequity.

Although it seems clear that the use of SIMS is likely to expand in UK nurse education (NMC 2023), and that some countries are already using SBE to substitute for large proportions of placement hours (50% in the US) it is important that educators retain an evidence-based approach to the use of SIMS and not to assume that it is necessarily effective, beneficial or the most appropriate option. SBE is still a relatively new area of nurse education and is rapidly developing. As discussed, there are many gaps or weaknesses in the literature around SBE, which should be borne in mind alongside the wealth of evidence for positive outcomes from SBE.

2.2.6 Evaluations of SBE/AR

Given the design of the SIMS week (it included blended SBE and virtual simulation), the findings of Sim et al. (2022,35) in their systematic review are worth noting. They concluded that their *“meta-analysis demonstrated a significant improvement in clinical reasoning skills based on applied knowledge (know how) and clinical performance (show how) among nursing students and nurses in the virtual simulation groups compared with control groups.”*

2.2.7 Limitations in the evidence base for SBE and critical perspectives

The IFACSL (2021) has published standards to be used in evaluations of such innovations as the consequences of innovations in teaching are consequential for students and teacher (IFACSL Committee, 2021). Evaluations of traditional methods with SBE, SBE with AR and low vs high-fidelity (and other teaching methods using new technologies) are widespread in the literature: Gutierrez et al., 2007; Bowman et al, 2009; McCaughey & Traynor, 2010; Zarifsanejey et al., 2016; Edelbring et al., 2017; Farra et al., 2017; Harrington et al., 2017; Mohan et al., 2017; Aebersold et al., 2018; Haerling, 2018; Hamza et al., 2022; Singleton et al., 2022).

2.2.7.1 Inconclusive evidence on some aspects of SBE

Although there is considerable evidence in the literature of SBE having positive educational outcomes, particularly improved clinical skills, student satisfaction and improved confidence of students, there are areas where the evidence is inconclusive (i.e. the development of decision-making skills through SBE, Stayt 2012). This does not mean that SBE does not potentially improve decision-making skills but rather that this is not clearly shown in the available evidence. This may be because there are a number of weaknesses and gaps in the evidence base around SBE, such as few studies which have control groups or take a longitudinal approach. However, research in this area is expanding very rapidly (Cant and Cooper 2017). These limitations in the evidence for SBE are dealt with more thoroughly in the discussion section.

3 Research Design, methodology data collection

A realistic evaluation approach was undertaken (Pawson and Tilley 1997) using a mixed methods research design incorporating: an online survey (pre and post SIMS week), observations of staff and students during SIMS week, including the debriefing sessions delivered by staff, focus groups with students who had participated in SIMS week (pre and post) and online focus groups with staff (pre and post).

Invitations to participate in the evaluation were designed by the evaluation team, but were administered by the SIMS teaching team so that the evaluation team did not have access to the person data/emails of the students.

3.1 Student survey

All students who were invited to take part in SIMS week (n=45) were also invited to take part in an online survey, before and after (pre and post) SIMS week.

There were 35 survey responses (18 pre-SIMS week and 17 post-SIMS week). All respondents were first-year nursing students. Overall, 57% (n=16) of respondents were from mental health, 28.6% (n=6) adult and 14.3% (n=4) were CYP. Half of respondents (n=14) were 44 or under and half (n=14) were 45-55. Some respondents dropped out before completing all questions, so the 'n' on many questions is less than 35.

At least 57.1% (n=16) of survey respondents were female (a further 11.4%, n=4 chose 'other' but most of those gave responses indicating that they were female); 21.4% (n=6) were male with one respondent identifying as 'non-binary'.

Although the survey did not ask about ethnic or cultural background, it seemed from focus group responses that many participants were either of Black British or Black African ethnicity and this is supported by departmental admissions data on the demographics of students from the 2022 intake which is summarised below.

3.2 Student admissions data (2022 intake)

The data held on the whole 2022 pre-registration intake (from which the students in the evaluation were drawn) shows that a large majority of students are female (84.5%, n=316) and there is quite a wide distribution of ages with 50.3% (n=190) 32 years or younger and 49.6% (n=187) being 33 or older . Over one fifth (21.2%, n=80) are 46 or older and 6 students (1.6%) are 58 or older. A substantial majority of students (64.2%, n=230) are Black, 12.3% (n=44) are Asian, 18.4% (n=66) are White and 5% (n=18) are mixed.

Table 3: Student demographics by specialty

		Programme Name							
		BSc Nursing (Adult)		BSc Nursing (CYP)		BSc Nursing (Mental health)		Total	
		N	%	N	%	N	%	N	%
Age	18-25	61	28.2%	61	79.2%	9	10.7%	131	34.7%
	26-31	34	15.7%	7	9.1%	4	4.8%	45	11.9%
	27-32	10	4.6%	1	1.3%	3	3.6%	14	3.7%
	33-38	35	16.2%	4	5.2%	8	9.5%	47	12.5%
	39-45	39	18.1%	1	1.3%	20	23.8%	60	15.9%
	46-51	22	10.2%	2	2.6%	18	21.4%	42	11.1%
	52-57	14	6.5%	1	1.3%	17	20.2%	32	8.5%
	58+	1	0.5%	0	0.0%	5	6.0%	6	1.6%
Total		216	100.0%	77	100.0%	84	100.0%	377	100.0%
Gender	F	190	89.2%	75	97.4%	51	60.7%	316	84.5%
	M	23	10.8%	2	2.6%	33	39.3%	58	15.5%
	Total	213	100.0%	77	100.0%	84	100.0%	374	100.0%
Ethnicity	Asian	28	13.8%	14	19.7%	2	2.4%	44	12.3%
	Black	125	61.6%	33	46.5%	72	85.7%	230	64.2%
	White	41	20.2%	18	25.4%	7	8.3%	66	18.4%
	Mixed	9	4.4%	6	8.5%	3	3.6%	18	5.0%
	Total	203	100.0%	71	100.0%	84	100.0%	358	100.0%

(NB base is all 2022 pre-registration intake –not just those students who took part in the evaluation)

MH students are much more likely to be male (39.3%, n=58) and of Black ethnicity (85.7%,n=72) compared to other specialities. CYP students are almost exclusively female (97.4%, n=75) and are the least likely to be of Black ethnicity (although this is still very substantial at 46.5% (n=33).

The average age varied very considerably by programme as shown below, with 24.3 years for CYP, 34.46 for Adult and 43.06 years for mental health. The mean age overall was 34.3 years.

Table 4: Student age - by programme

Student Age				
Programme Name	Mean age (years)	N	Std. Deviation	Median
BSc Nursing (Adult)	34.46	216	10.581	33.00
BSc Nursing (Child)	24.30	77	6.667	22.00
BSc Nursing (Mental health)	43.06	84	11.060	44.00
Total	34.30	377	11.732	32.00

(NB base is all 2022 pre-registration intake – not just those who took part in the evaluation)

Gender and age intersect as shown below – female students have an average (mean) age of 32.87 years compared to 41.36 for men. Ethnicity and age also intersect – White students tends to be considerably younger (mean 29.89 years old) compared to Asian students. (mean 32 years old) and Black students (mean age 36.48).

Table 5: Student age - by gender and ethnicity

Student Age			
		N	Mean
Gender	F	316	32.87
	M	58	41.36
	Total	374	34.19
Ethnicity	Asian	44	32.00
	Black	230	36.48
	White	66	29.89
	Mixed	18	31.11
	Total	358	34.44

(NB base is all 2022 pre-registration intake –not just those who took part in the evaluation)

Another way of looking at these patterns is through cluster analysis as shown in Table 6. This shows five distinct clusters within the 2022 pre-registration cohort. The first (22.5% of students) are predominantly young, White and on adult nursing programme, the second (22.25%) are all adult nurses, 81% Black ethnicity and 100% female. The third cluster (19.7%) is nearly all in MH (84.3%), tending to be aged 39-45 and nearly all (95.7%) of black ethnicity and 58.6% male. The fourth cluster is predominantly in adult nursing, they are heavily concentrated in the 18-25 age group (62.1%), 100% Black ethnicity and 100% female. The final cluster are all in CYP, are all female, are nearly all 18-25 (95.1%) and 52.5% in this group are Black.

Table 6: Cluster analysis of student demographics

Size	22.5% (80)	22.2% (79)	19.7% (70)	18.5% (66)	17.1% (61)
Inputs	Programme Name BSc Nursing (Adult) (77.5%)	Programme Name BSc Nursing (Adult) (100.0%)	Programme Name BSc Nursing (Mental health) (84.3%)	Programme Name BSc Nursing (Adult) (75.8%)	Programme Name BSc Nursing (Child) (100.0%)
	Age 18-25 (30.0%)	Age 33-38 (39.2%)	Age 39-45 (32.9%)	Age 18-25 (62.1%)	Age 18-25 (95.1%)
	Ethnicity White (55.0%)	Ethnicity Black (81.0%)	Ethnicity Black (95.7%)	Ethnicity Black (100.0%)	Ethnicity Black (52.5%)
	Gender F (80.0%)	Gender F (100.0%)	Gender M (58.6%)	Gender F (100.0%)	Gender F (100.0%)

(NB base is all 2022 pre-registration intake –not just those who took part in the evaluation)

3.3 Student focus groups

All students were invited to a focus group on the second day of SIMS week and on the final day. 12 students attended the former and seven students attended the latter. As with the survey, students from MH specialty were over-represented, forming 50% of participants (6 of 12) in focus group 1 and 57% of participants in (4 of 7) in focus group 2, with CYP students being under-represented (just three participants in focus group 1 and 1 participant in focus group 2). It is not clear if this is because MH students were more interested in the focus groups or because more MH students actually attended SIMS week.

Table 7: Attendance at evaluation student focus group, by specialty

Specialty	FG1 (day 1 of SIMS week)	FG2 (day 5 – the final day of SIMS week)	Total
Adult	3	2	5
Mental Health	6	4	10
Children and Young People	3	1	4
Total attending	12	7	19

3.4 Staff focus groups

There were two online focus groups with staff who were involved in planning, delivering or supporting SIMS week; one of these was just before the start of SIMS week and one at the end of SIMS week. These focus groups lasted for an hour each. All staff identified as working on the SIMS project (n=22) were invited to participate and six agreed to participate in each focus group. A total of ten staff members participated (there was little overlap between the people attending the first focus group and the second with only two people participating in both focus groups).

3.5 Observations

Observations of staff and students were carried out through SIMS week (three of the five days were on campus at StoneX and two were wholly online, with students participating from home). For the online days, researchers joined the online activities including break out groups and made detailed notes on the interactions of staff and students using a semi-structured observation schedule. For the days on campus (based around ward simulation scenarios) researchers engaged in non-participant observation, using the same semi-structured observation schedule. Staff and students were asked to complete a consent form in relation to the observations.

4 Data Analysis

Quantitative survey data were analysed in SPSS v.27, producing a range of descriptive and inferential statistics. The data from observations which were captured in semi-structured observation schedules were also coded in NVIVOv20. The interview and focus groups were transcribed verbatim and thematically analysed in NVIVO v20. The responses to open-ended survey questions were also coded in NVIVOv20.

4.1 Survey response

There were 35 student survey responses in total⁴ (18 from pre and 17 from post surveys). While we can count the number of survey responses (n=35) it was not possible to check the number of unique respondents (i.e. how many students in total responded). Although the survey was carried out on an anonymised basis it was hoped to link pre and post responses by asking respondents to think of a five digit number when they completed the pre survey, to make a note of it and to enter it again when completing the post survey. However, most respondents did not do this and there was no way to enforce it. Some students may have done the pre survey but not post or vice versa but it is likely that there is a lot of overlap between pre and post (many who did the pre survey also did the post survey).

Staff reported that they had invited an equal number of students (n=15) from each specialism (adult, MH and CYP) to take part in SIMS week, but there was large variation in the numbers taking part in the survey according to specialism. It is not clear if the variation in survey participation by specialty was due to differential levels of interest in the evaluation or differential levels of attendance at SIMS week (no register was taken so it is not possible to check).

4.2 Sample characteristics

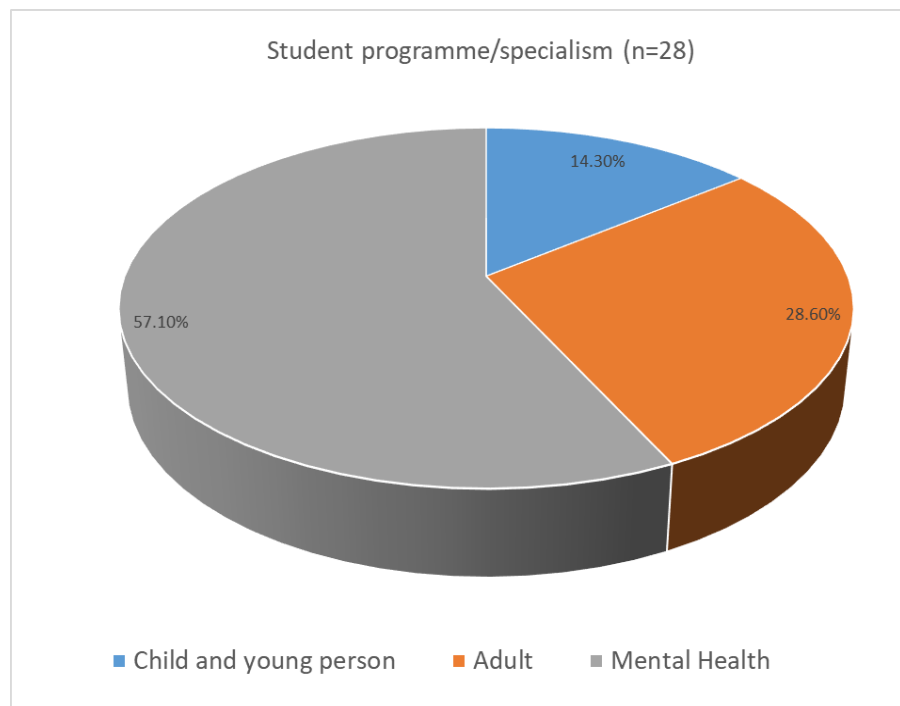
All survey respondents were first-year nursing students. The demographic characteristics of the students who participated in the evaluation are described below.

⁴ The number of responses on each question varies as not all respondents completed all the questions in the questionnaire

4.2.1 Programme and specialism

Overall, 57% (n=16) of responses were from mental health specialty; 28.6% (n=8) from the adult specialty and 14.3% (n=4) were from the CYP specialty.

Figure 1: Student programme/specialism

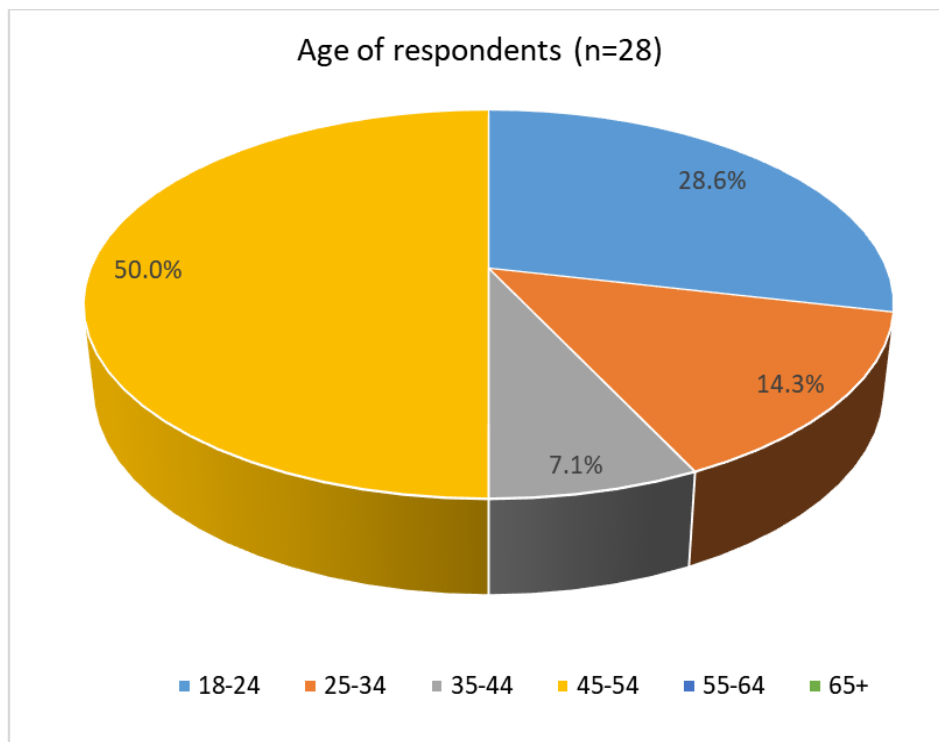


There were 16 responses from MH students but only 6 for adult and 4 for CYP. These patterns were also reflected in focus group participation (i.e. the majority of participants were from MH).

4.2.2 Age

Half of respondents (n=14) were aged 44 or under and half (n=14) were 45-55. The sample was therefore quite mature in terms of age.

Figure 2: Age of student survey respondents



4.2.3 Gender

At least 57.1% (n=16) of survey respondents were female (a further 11.4%, n=4 chose 'other' but most of those gave response indicating that they were female) and 21.4% (n=6) were male with one respondent identifying as 'non-binary'. The proportion of males may be slightly higher due to the high proportion of mental health students in the sample (mental health has traditionally had a higher proportion of males in the workforce than other nursing specialisms).

4.2.4 Ethnicity

Although the survey did not ask about ethnic or cultural background it seemed, from focus group responses that the vast majority of participants in SIMS week were of Black British or Black African ethnicity/background and this is supported by demographic data held by the department.

4.2.5 Learning style

A large minority of respondents (41.2%) identified their learning style as visual/spatial; 28.6% felt that their learning style was kinaesthetic/tactile; 7.6% said that their learning style was 'reading/ writing' and 4.2% said that it was auditory. 22% of respondents chose 'other' or 'don't know'.

Table 8: Learning style of respondents (self-identified)

Learning Style	N	%
Visual/spatial (you learn more effectively through seeing and observing things, including pictures, diagrams, written directions and more. This is also referred to as the "spatial" learning style)	15	53.6
Kinaesthetic/tactile (you learn more effectively through experiencing or doing things - acting out events or using your hands to touch and handle in order to understand concepts)	5	17.9
Reading/writing (you learn more effectively through written words and may be drawn to expression through writing, reading articles on the internet, writing in diaries, looking up words in the dictionary)	4	14.3
Auditory (you learn more effectively when the subject matter is reinforced by sound. You might prefer to listen to a lecture than to read written notes, and you may use your own voice to reinforce new concepts and ideas)	2	7.1
Other (please write in)	1	3.6
Prefer not to say	1	3.6
Don't know/not sure	0	0
Total	28	100

5 Survey Findings

5.1 Possible barriers to participation in SIMS week (participating from home/online/remotely)

Table 9: Possible barriers to participation in SIMS week (participating from home/online/remotely)

	PRE SIMS WEEK (n=14-16)				POST SIMS WEEK (n=11-12)				
	Not a barrier at all	Something of a barrier	A very significant barrier	Total of 'Something' and 'significant' barrier	Not a barrier at all	Something of a barrier	A very significant barrier	Total of 'Something' and 'significant' barrier	Pre-post difference (something and 'significant' barrier)
Do not have a quiet/comfortable environment at home	57.1%	35.7%	7.1%	42.9%	72.7%	27.3%	0%	27.3%	-15.6%
Difficulty in installing software or logging in	71.4%	28.6%	0.0%	28.6%	75%	16.7%	8.3%	25%	-3.6%
Poor quality / low speed internet at home	73.3%	20%	6.7%	26.7%	83.3%	8.3%	8.3%	16.7%	-10%
My IT skills are not very good	75%	25%	0%	25%	83.3%	8.3%	8.3%	16.7%	-8.3%
Lack of access to a suitable device (e.g. laptop/tablet etc)	86.7%	13.3%	0%	13.3%	83.3%	8.3%	8.3%	16.7%	3.4%
Quality of device (e.g. laptop/tablet etc) was not good	86.7%	6.7%	6.7%	13.3%	75%	16.7%	8.3%	25%	11.7%
Having to compete with other members of the household for internet access or use of a device	86.7%	6.7%	6.7%	13.3%	75%	16.7%	8.3%	25%	11.7%
I am not confident about using information technology (IT)	92.9%	7.1%	0%	7.1%	83.3%	8.3%	8.3%	16.7%	9.6%

The student survey investigated aspects of SIMS week in terms of barriers/facilitators to participation in SIMS week (pre and post, and at campus and when participating remotely), views on the scenarios (content, realism, duration) and other activities. The survey also asked about confidence (pre and post SIMS week) and overall satisfaction with SIMS week. Respondents were asked to rate these aspects on a three-point scale: 'not a barrier at all', 'something of a barrier' and 'not a barrier at all'⁵.

In the 'pre-SIMS week' surveys, most of the items presented in the questionnaire were not anticipated as being barriers by a majority of respondents. The biggest barrier which students anticipated was not having a quiet/comfortable environment at home, which 42.9% thought would be with something of a barrier or a very significant barrier; but in the post SIMS week survey this was reported as actually being a barrier (something of a barrier or a very significant barrier) by just over a quarter of respondents (27.3%). Therefore, the absence of a suitable home environment for participation was less of a barrier than anticipated but still a barrier for some. Around a quarter of respondents anticipated that difficulty in installing software or logging in would be a barrier (something of a barrier or a very significant barrier) and it was actually a barrier for around the same proportion though most of those felt it was 'something of a barrier' rather than a 'significant barrier'. Around a quarter also anticipated that internet speed would be a barrier but this was actually the case for a much lower percentage (16.7%). Some aspects were slightly more of a barrier than students had anticipated (confidence in IT, having to compete with others in their household for the use of a device and the quality of the device used to access the internet) but only to a very limited extent and these aspects were not considered to be a barrier for most respondents.

⁵ Between 1 and 4 respondents answered 'don't know/ not sure' on each of the questions – these responses were excluded for the purposes of this analysis

5.2 Possible barriers to participation in SIMS week (participating on campus at StoneX)

Most items were not anticipated to be barriers by most respondents. There was some anticipation that scenarios would be hard to understand, would last too long or that there would not be enough support from staff but responses in the 'post' survey suggests that these concerns turned out to be unfounded, and these aspects were not barriers for students when participating in SIMS weeks at StoneX.

Table 10: Possible barriers to participation in SIMS week (participating on campus at StoneX)

	PRE SIMS WEEK (n=10-13)				POST SIMS WEEK (n=11-12)				Pre-post difference (something / significant barrier)
	Not a barrier at all	Something of a barrier	A very significant barrier	barrier (something / significant)	Not a barrier at all	Something of a barrier	A very significant barrier	barrier (something / significant)	
Scenarios will be hard to understand/were too hard to understand	76.90%	23.10%	0.00%	23.10%	100.00 %	0.00%	0.00%	0.00%	-23.10%
Scenarios will last too long/did last too long	70.00%	30.00%	0.00%	30.00%	91.70%	8.30%	0.00%	8.30%	-21.70%
There will not be enough support from staff/was not enough support from staff	61.50%	30.80%	7.70%	38.50%	100.00 %	0.00%	0.00%	0.00%	-38.50%
There will not be enough support from peers/was not enough support from peers	76.90%	23.10%	0.00%	23.10%	91.70%	8.30%	0.00%	8.30%	-14.80%
I am not confident about using the equipment in scenarios	84.60%	15.40%	0.00%	15.40%	91.70%	8.30%	0.00%	8.30%	-7.10%
Scenarios will not be relevant / were not relevant	83.30%	16.70%	0.00%	16.70%	90.90%	0.00%	9.10%	9.10%	-7.60%
Scenarios will not be realistic/were not realistic	75.00%	25.00%	0.00%	25.00%	100.00 %	0.00%	0.00%	0.00%	-25.00%

5.3 Satisfaction with scenarios when participating in SIMS week on campus (StoneX)

Satisfaction with all aspects of scenarios was very high with 100% of students being fairly or extremely satisfied on all aspects. The proportion who were 'extremely satisfied' was highest in relation to support from staff and the overall experience (83.3% in each case) and lowest with regard to realism of scenarios (without actors). These responses must be understood in the context of large proportions choosing the neutral response (neither satisfied nor dissatisfied) and some of those having done so because they did not take part in such scenarios and therefore may have felt they could not comment meaningfully⁶. These results must also be viewed in the context of small absolute numbers of respondents (n=12) even though this was a fairly large proportion of the sample.

Table 11: Satisfaction with various aspects of scenarios (on campus)

Item in questionnaire	Extremely dissatisfied	Fairly dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Extremely satisfied	All satisfied (fairly + extremely satisfied)	N	%
Support from staff during scenarios	0.00%	0.00%	0.00%	16.70%	83.30%	100.00%	12	100.00%
Overall experience of scenarios	0.00%	0.00%	0.00%	16.70%	83.30%	100.00%	12	100.00%
Preparation for scenarios	0.00%	0.00%	0.00%	25.00%	75.00%	100.00%	12	100.00%
Debrief after scenarios	0.00%	0.00%	0.00%	25.00%	75.00%	100.00%	12	100.00%
Realism of scenarios (with actors)	0.00%	0.00%	0.00%	33.30%	66.70%	100.00%	12	100.00%
Support from peers during scenarios	0.00%	0.00%	0.00%	33.30%	66.70%	100.00%	12	100.00%
Realism of scenarios (without actors)	0.00%	0.00%	0.00%	41.70%	58.30%	100.00%	12	100.00%

⁶ One respondent answered 'don't know/ not sure' on each of the questions – this respondent was excluded for the purposes of this analysis

5.4 Overall satisfaction with various aspects of SIMS week

Nearly all respondents were fairly or extremely satisfied on all aspects with the exception of ‘overall experience of SIMS week when participating from home/remotely’ where 91.7% were fairly or extremely satisfied (one respondent was extremely dissatisfied)⁷. There was however some variation in the proportion who were ‘extremely satisfied’ which showed considerably less satisfaction with participation in SIMS week from home (58.3% extremely satisfied) compared to participation on campus (75% extremely satisfied). The relatively lower satisfaction with online participation/online activities compared to participation on site was confirmed in other data such as focus groups and observation) and is discussed later on in this report.

Table 12: Students' overall satisfaction with SIMS week

Item in questionnaire	Extremely dissatisfied	Fairly dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Extremely satisfied	All satisfied (fairly + extremely satisfied)	N	%
Overall experience of activities other than scenarios	0.00%	0.00%	0.00%	25.00%	75.00%	100.00%	12	100.00%
Relevance of SIMS week in preparing for placements	0.00%	0.00%	0.00%	16.70%	83.30%	100.00%	12	100.00%
Overall experience of SIMS week when participating from home/remotely	8.30%	0.00%	0.00%	33.30%	58.30%	91.70%	12	100.00%
Overall experience of SIMS week when participating in person at StoneX campus	0.00%	0.00%	0.00%	25.00%	75.00%	100.00%	12	100.00%
Overall experience of SIMS week	0.00%	0.00%	0.00%	25.00%	75.00%	100.00%	12	100.00%

⁷ One respondent answered ‘don’t know/ not sure’ on each of the questions – this respondent was excluded for the purposes of this analysis

5.5 Confidence pre and post SIMS week - possible effects of SIMS week

Students completed the survey questions below a few days before SIMS week ('pre') and just after SIMS week ('post'). Questions covered students' confidence on a range of aspects including IT, communication skills, linking theory and practice, decision making about patient care and going into placements..

Table 13: Student confidence pre and post SIMS week

Item in questionnaire	(PRE) %Fairly or extremely confident	N	(POST) % Fairly or extremely confident	N	% increase from pre to post
Your overall confidence as a student nurse	73.30%	15	100.00%	12	26.70%
Your confidence to go into placements	73.30%	15	91.70%	12	18.40%
Your confidence in taking part in simulated learning online	73.30%	15	100.00%	12	26.70%
Your confidence in decision-making about patient care	78.60%	14	100.00%	12	21.40%
Your confidence in taking part in learning scenarios in person	78.60%	14	100.00%	12	21.40%
Your confidence in being able to link theory and practice learning	80.00%	15	100.00%	12	20.00%
Your confidence in online learning generally	80.00%	15	100.00%	12	20.00%
Your confidence in your skills around patient assessment	80.00%	15	100.00%	12	20.00%
Your confidence in your clinical knowledge generally	80.00%	15	100.00%	12	20.00%
Your confidence in using/interacting with simulation equipment such as manikins	85.70%	14	91.70%	12	6.00%
Your confidence in using your reflective skills effectively	86.70%	15	100.00%	12	13.30%
Your confidence in your professional communication skills to enhance delivery of safe & effective practice	86.70%	15	91.70%	12	5.00%
Your confidence in using IT generally	93.30%	15	100.00%	12	6.70%

Confidence was already quite high in the 'pre' survey in relation to most aspects but all items nonetheless showed increase at the 'post' survey, particularly in relation to 'Your overall confidence as a student nurse' and 'Your confidence in taking part in simulated learning online' (+26.7% in % fairly or extremely confident for each, pre to post). Increases in confidence were smallest in relation to 'professional communication skills to enhance the delivery of safe and effective practice' (+5%); confidence in using IT generally (+6.7%) and 'Your confidence in using/interacting with simulation equipment such as manikins' (+6%) although it must be noted that confidence was very high at 'pre' for all of these items (leaving relatively limited scope to improve further). Although there was substantial change from pre to post, none was statistically significant (Mann Whitney test $p > .05$) probably because of low statistical power.

5.6 Views on the length of Scenarios

The scenarios were of varying length but essentially took place over a whole day, book ended by 30 minutes' prebriefing at the start of the day and a 60 minute debriefing at the end. The vast majority of respondents (92.3%, $n=12$) felt that the duration of the scenarios was about right.

Table 14: Views on the length of scenarios

Item in questionnaire	N	%
Scenarios were too short	0	0.00%
Scenarios were about the right length	12	92.30%
Scenarios were too long	1	7.70%
Total	13	100.00%

5.7 Most useful modes of learning

Students were asked to rank the items below, with the most useful to be placed at the top and the last useful to the bottom. The items with the lowest means are considered the most useful (ward days with mean rank 1.92 and online activities 2.38). This is consistent with survey data showing lower satisfaction with online activities as compared to learning on campus.

Table 15: Student views on most useful modes of learning

Item in questionnaire	N	Mean
Ward days	35	1.92
Face to face activities	35	2.23
Online activities	35	2.38
Other	35	3.46

5.8 Survey : open ended responses

Respondents were asked to identify up to three things which they hoped to get from SIMS week (in the pre survey) and which they felt that they had got from SIMS week (in the post survey). The table below shows the results of qualitative coding of these responses. The number of respondents was small but the aspects most often mentioned at pre and post were confidence (generally), skills and then various other aspects of confidence (in practice, with equipment, working as a team). The numbers hoping to get these outcomes are similar to the numbers saying they did get them (e.g. 15 responses saying they hoped to get confidence generally and 13 saying that they did get confidence generally from SIMS week).

Table 16: Things which students hoped to get from SIMS week

Things which respondents hope to get / improve on from SIMS week/did get from SIMS week	PRE (N=12) (Hoped to get)	POST (N=10) (did get)
confidence	17	13
skills/learn skills	9	11
confidence in practice	3	4
want more confidence using equipment	3	1
confidence working as a team	3	4
communication	2	0
assessing or observing patients	3	3
peer learning	1	0
professionalism	1	0
gain knowledge	1	1
better understanding of IT in learning	2	3
theory and practice links	3	2
build confidence on patient care	1	0
improving evidence based research	1	2
demonstrating professionalism	2	0
decision making	1	0
experience	1	0
practice	1	0
evaluation	0	1
online activities v Interesting	0	1
patient safety	0	1
time management	0	1
administering medications	0	5
handover	0	1
learned how to do injections	0	1
understanding escalation	0	2

The themes derived from coding the open-ended responses (confidence, skills, communication and professionalism) are discussed below with example verbatim quotes to illustrate the themes.

5.9 Confidence

Confidence in various senses was by the far the strongest theme to emerge from analyses of the open-ended responses. Confidence was referred to in terms of patient care, confidence in practice and confidence in working as a team and using equipment. Some examples of responses from 'pre' and post survey responses are shown below⁸.

Table 17: Aspects of confidence which students hoped to get/did get from SIMS week

Pre survey	Post survey
Build up more confident on patient care	Confidence to go to placement
I want to gain a lot of knowledge and be able to apply it to practice	Practiced clinical teamwork skills
I want to be more confident using equipment	Increased confidence in patient care
Confidence in practice	Working as a team
Building confidence	Using all the equipment and working on the ward environment
Be able to utilise tech	I have more confidence in doing vital sign and urinalysis test after we are practicing it in the ward.
Enhance teamwork skills	I also appreciate working together as a team with peers and the lecturer, the experience was so informative and educating.
Being confident in emergency	Confidence building

⁸ NB these are not matched pairs of responses – i.e. it is not necessarily the same student's response in each row of the table

5.10 Skills

There were relatively frequent references to improving or acquiring skills. Comments from students referred to skills in assessing and observing patients and knowledge and administration of medications.

Table 18: Skills which respondents hope to get / improve on from SIMS week/did get from SIMS week

Pre	Post
Assessing patient	Administration of medication
Observation skill	Medication
I want to gain more skills	Learned how to do injections
Physical observation	Manual vital signs
To have understanding of how technical and non-technical skills work to deliver care and interact with people.	Communication skills for Handover

5.11 Communication

There were a considerable number of references to communication in both pre and post questionnaires.

Table 19: Aspects of communication which students hoped to get/did get from SIMS week

Pre	Post
Good communication skill	Effective communication
More understanding on communication skills	Communication
Communication	Communication

5.12 Professionalism

There were a number of references which related to professionalism:

Table 20: Aspects of professionalism which respondents hoped to get / improve on from SIMS week/did get from SIMS week

Pre	Post
Understanding of being registered nurse	Time management
Decision making	Professionalism
	Demonstrating professionalism

5.13 Focus group findings

Pre and post focus groups were carried out for staff and students (a total of four focus groups). The 'pre' focus group for staff was carried out online – the remaining three focus groups were face to face, at the StoneX campus. Each pair of focus groups (e.g. pre and post for students and pre and post for staff) were coded together (i.e. coded to a single set of codes) and then these were compared across pre and post focus groups using a matrix query in NVIVO. This avoids having a very large number of codes and also means that the frequency of a code can be compared in pre and post focus groups, where that is applicable⁹.

5.13.1 Student focus group findings

The themes which were extracted in relation to the student focus groups were:

- Barriers to participation in SIMS week
- Attitudes to online activities
- Realism of the scenarios
- Skills or procedures
- Change over the week

These themes are described below along with illustrative verbatim quotes.

5.13.1.1 *Barriers to participation in SIMS week*

Barriers to participation in SIMS week which were mentioned included the accessibility of StoneX campus which was a long journey for many students and it was common for students to travel 1.5-2 hours each way, to and from home (one student said that they were travelling 2.5 hours each way). However, in most cases it seemed the journey time was not greatly different from what it would have been to the Hendon campus. The high cost of public transport was also mentioned (although it is not clear if the cost was any higher than attending the Hendon campus and there is a free shuttle bus from the Hendon campus to StoneX) and transport issues were exacerbated by a tube strike during one of the days of the SIMS week.

There were some issues around communications between the department and students about attending the SIMS week. Some students were not clear why they had been selected, whether attendance was compulsory, and what the week would entail. Some students said that they had not been given a detailed programme of activities for the week. Staff insisted that students had been clearly informed on most of these points which may well be the case but nonetheless the communications did not always appear to have been clearly understood. One student said:

“Maybe a bit of clarity will help, because it’s a great session and to be honest we were all thinking that, why we are here in the beginning of the week, like if we did something wrong, that’s what it felt like you know why, we had attendance. We all had good attendance and we were trying to figure out why, what is the reason why we were brought here. And it turned out to be such a great week, such a fantastic session and I think there is nothing more beneficial for us than practicing actual clinical skills in here” (Student FG 2).

Some students felt that a slightly later start would be helpful given the distances that many have to travel and the intensity of the day, and some also thought that one of the five days should be a day off. Although the question was not asked in the student focus group, some staff commented that many students were working a very significant number of hours of paid employment outside of the nursing programme and many students highlighted that SIMS week was very close to the deadline for coursework and the start of placement, and some felt that this had placed them under undue pressure. As one student said

“And this programme as well is good if they can put it in our programme, but this time of the year is not good, because by Monday now we are starting a placement and I do not even know a clue of where I am going. Tonight now, I have to go all the way, yeah it’s true, that’s my ... so we have to go all the way to try and look for where I’m doing my placements and everything, get everything ready for Monday and I have children as well.” (student FG 2)

Access to devices and internet did not seem to be an issue for most students. However, one said that their internet connection could be slow when many people in the household were using it. During the two days on which students were participating from home it seemed that many were participating on phones rather than laptops or ipads. In some cases this was because students were ‘on the move’ while participating (shopping, travelling, washing up). Teaching staff did not insist on cameras being on for participation in the online activities, but do intend to do so for the future as it is otherwise quite hard to judge whether students are fully engaged with online activities.

One student described having to join by phone and how this was less than ideal:

“I do have a laptop, but yesterday it was very, very windy and my internet was cut off and I couldn’t connect. So I had to like go on my phone and it was a bit challenging, because like she said with the Padlet and everything you know, going in between and connecting, so that was a challenge I was having yesterday with the internet connection just cut off totally and I couldn’t because I had, I started with the laptop, on my laptop and for the reason, because of the wind, I don’t know, but the connection, everything just went off” (student FG 1)

5.13.1.2 Attitudes to online activities

Students were based at home for two of the five days of SIMS week, during which they participated in online activities. Attitudes to the online activities seemed positive although there was noticeably more

ambiguity towards the activities when compared to the on campus simulation activities (e.g. ward based scenarios or 'nursing Olympics'). One student said:

“it's not real {i.e. online simulation exercise } but it's actually what we expected to be doing in that placement so that patient like communication, ? analysis and all of that. So by interacting and getting with each other, and we have a kind of order, or discipline, let's say order of branch of nursing, like child, like adult, working together and yeah it's very good”. (student FG2)

Students were very positive towards the learning from a video in the padlet in which a nurse talked about how she had managed a situation in which a white patient had commented on the ethnicity of the nurse (who is black). They admired the way the situation had been resolved (by the nurse responding in a friendly way to the patient and not taking offence at the comments).

“It was, yeah, it was really clear . Especially, there was one part of the padlet that I really like, when the nurse walked in and the patient went, ‘oh she's black’’, because it's something I've never experienced. But by seeing the way the nurse was able to approach the patient, it was quite amazing”. (student FG2)

Another added that the padlet activity had helped prepare her in the event of encountering such a situation:

“Because maybe if I didn't go through this padlet, I wouldn't be able to be like this in hospital” (student FG2)

However, when students were put into breakout groups to collaborate on particular tasks there were some issues with students not understanding the task, and in some cases very low levels of interaction between students.

One student said:

“To me the pilot is not that clear, that much, because in my group we weren't getting much about it and then later on it kind of, even though it's clear, we don't have enough of time to finish up all the scenarios, so apart from that everything was fine”. (student FG 2)

It was clear that some students did not see the value of the online activities and had a clear preference for participation in person at the StoneX campus. This student also highlighted the distractions from learning which may occur when participating from home:

“Yeah it wasn’t, the online for me is not, well I don’t learn properly online that is what I was thinking, because I’ll be, even myself I do put the camera off, because I want to do something, or maybe my son is asking me something and I’ll be okay, I’ll take the camera off and listen, or maybe my phone is ringing and I’ll take it. So many distractions, so mostly when even the lecturer I see online I object to it and say I would rather prefer to come to the campus, because I learn more in the campus” (Student FG 2)

Several students mentioned that students had their cameras off (as noted above) and that this made it more difficult to interact online especially with students who they may not have met previously (this is particularly the case in relation to students from other branches). One student said:

“Or maybe they want to be doing something else and it’s not, it doesn’t really, because the camera is not on and you are just talking to a blank something, it doesn’t really feel like you’re really communicating at all. So that’s why I said if you can have the camera on, then we actually understand each other and we can actually communicate properly, by seeing each other. But still, the camera was still off, so I couldn’t” (Student FG2)

And the interviewer commented in reply to that:

“You used a term, which was, it’s like talking to ghosts, which was a really good metaphor, because it is a bit like talking to a vacuum”. (Interviewer, FG2)

It was suggested that some students might be logged in but having turned their cameras off might not be present for some parts of the online activities in break out groups. A student said:

“For me I don’t like online activities actually, I really hate them, so I didn’t enjoy it....Just obviously some people log in and are not there. Some people are there, but don’t talk. That’s what I don’t like”. (Student FG1)

Another student said:

“When it’s face to face it’s definitely a better learning experience, online it’s not, because obviously some people maybe shy, or whatever, but once you’re here you are kind of forced to come out of your shell, because everyone is very supportive, no one is judgemental and it’s really positive”. (Student FG2)

However there were positive comments about the online activities and it seemed that students on the whole did value them. One student highlighted that although some of these activities had been covered in their programme already, there was value in being able to learn from other nursing specialisms as students from

adult, MH and CYP might not normally encountered each other very often in the standard programme at Hendon.

“I don’t know, most of the things we’ve done, I sort of already knew, but then we done it more in-depth and I got to see, you know usually when I’m in class I only see adult nursing students, but yesterday when we were on the stream, I saw you know the new point of mental health nursing students, child nursing students. So it was helpful to see their insight and things they’ve learned that they brought to the table, so that was quite good”. (Student FG1)

Another student said that they had been able to get advice from students in another specialism about their forthcoming placements:

“Yesterday {i.e. the online participation from home} was good in a positive way, because I was in a group which is adult and child, so we were able to share our ideas and experience on our first placement, because my next placement is adult, so I was able to ask a few questions from my other colleagues, to know what to expect you know, because it’s quite a different setting you know from mental health and adults. So I was able to grab one or two ideas from what to expect when I’m going into the next placement”. (student FG 1).

5.13.2 Realism of the scenarios

It was clear that most students felt that the scenarios had a high degree of realism. One student described their experience of a scenario which involved taking observations from a manikin which had voice interactivity (via a remote operator):

“Oh yes there’s quite a lot of improvement. I feel really excited, even though I’m tired, because by the end, it’s the end of the week, which is Friday, it’s really tiring, waking up, getting up and yesterday was really fun, because it actually looked real. Like a hospital environment, we actually work on the manikin and the one I worked with was actually talking, so it feels so real. It feels as if I’m actually working in the hospital with a client”. (Student FG 2)

However it was also clear that there was a significant difference between scenarios involving manikins and those involving actors.

“With the actor, it’s a totally different experience, because the manikin, yes, but then there is a patient who is talking and who is complaining and who is, you know arguing and saying, oh no this is wrong, where is my medication and stuff like this and you are kind of feeling the pressure. So it’s really, really, really helpful” (Student FG 2)

One student even said that the scenario with an actor was ‘more realistic’ than a placement experience in a hospital, in the sense that it was a more challenging experience, more representative of scenarios that she might actually encounter in the future.

'I felt it was more realistic than when I was in a hospital, because I was doing elderly people ward and they were very lovely... and in this case we had a young lady and it just, it showed the way, how the things might be, not the only way how I saw them. And it is a good preparation for me to understand that there are different environments and there are different characters and there are different people and we've got to be open-minded about all these situations''

Another sense in which scenarios might be 'more realistic' than actual clinical situations is that the actors can give feedback to the students afterwards about what they were feeling and how they perceived the students' performance as a nurse. Students also appreciated the realism of staff, in the scenarios, with lecturers acting as doctors or senior nurses and encouraging students to make decisions under pressure.

'Yeah that one was really, it sounds really real like when the doctor comes in and says oh, can you do this for your patient, can you go get that on your patient, {name of lecturer} sounds like the doctor communicating and telling us oh your doctor, the inputs, so it sounds like as if it's really, you have to be on your feet and you have to like know what to give back when she comes in, because you don't know what's going to happen''. (Student FG2)

However, in one case, a student drew attention to differences between placement experiences and the activities in the scenarios:

'But things like urine analysis you don't do on placement, well I didn't do on placement, where I was doing it. The sliding sheets I didn't do, manual blood pressure, we didn't do that anymore because obviously you use the automated blood pressure monitor and stuff like that''. (Student FG2).

The extent to which there may be differences between what students are taught or learn in scenarios and what they encounter on placements is perhaps an area that warrants further explorations. Just as there may be 'gaps' or differences in how students are taught in university and placement experiences then there may be differences between what students experience in scenarios and placements experiences or what is taught in the usual university programme (Allan & Evans, 2022).

5.13.3 Skills or procedures experienced

Some of the particular skills or procedures which students referred to in focus groups included basic measurements, blood pressure, removal of canula, handover, injection techniques, observations, refreshing skills, sliding sheets, urine test, vital signs. More generally, escalation was an aspect of some scenarios helping students to understand when to refer to more senior staff for advice or support.

One student reflected on how her confidence in the removal of canula had increased, partly because of the close teaching support she had received during the scenario. This quote also underlines the value that manikin-based scenarios can have.

‘‘I didn’t do it with the actors, I did it with the manikin. It was interesting because like the cannula aspect of it there’s a lot of chat about it and then my director was there to ask me to do question about when you start a cannula what are you expecting, are you expecting ? pain, and you make the blood come back, so what are you expecting to do. So you had the pain, okay two sights of it now have to take it off to do the charts and see the level of the cannula aspect of it. When it’s too ... of the colouring of the skin, or pain, then definitely you have to remove it. So I practice it and I see how to remove it and then the cannula on the manikin as well. I am getting more confidence about a lot of things, especially with the complication and the documentation of the job, because when you go to the placement sometimes these things become a reality’’ (Student, FG 2)

Another student commented in learning how to do urine tests:

‘‘I think the training and as we kind of familiarised ourselves through that and then we not exactly, when we went to the blood pressure, okay we know what to do, even though we don’t know if we are right or wrong, at least we have idea of what we’re doing. But when we got to the urine test, the first time was a bit tricky, but the second one at least we know, we’ve got an idea of what we are doing now’’. (Student FG 2)

5.13.4 Change over SIMS week: increased confidence and skills

It was clear that at the end of the SIMS week most students felt excited about the experiences they had had and above all were feeling much more confident about gaining particular skills and going into their first placement, a few days after the end of SIMS week. It obviously made sense for the SIMS week to immediately precede these students’ placement which is a time of anxiety and trepidation for many. Many students were also feeling tired or drained from what they experienced as a fairly intensive week. Students referred to acquiring particular skills e.g. injection technique and now feeling extremely confident with this skill as this exchange between interviewer and student below shows:

Student: ‘‘I’ve got quite a lot of assignment to do, by the end of, yesterday mostly I’m like I really appreciate them bringing me here, because I actually learnt a lot and um, mostly I learned about how to give the injection as well. Even though I tried it on the, on the toy one, it’s really, because the last time I came here to do the clinical skill, we actually did it, but because we are quite a lot, I couldn’t really get it, because I did the injection but the fluid came out. But this time around, there was enough time to put me true and I did it and I know the different ways of giving the injection and the different ways of, the two needles, the long one and the short one. And why they use the long one and the shorter one and what is the size of the longer one and the shorter one. So if any nurse tell me, or maybe the doctor say oh, can you get me 23 or 25, I know off the top of my head what they want to use it for’’.

Interviewer: ‘‘And you wouldn’t have before?’’

“I didn’t know, not a clue, I don’t have a clue of that at all and it actually sink in, because {name of lecturer} could tell me that how I can remember, just the intramuscular and subcutaneous, which is the, under the muscle and the top of the skin. So I did not have a clue of that.” (Student FG2).

Some students also referred to an increasing sense of professionalism and knowing when to escalate a patient’s care:

Student “how to compose ourselves professionally and how to help them with their demands and not to be overwhelming as well and when there are things that we don’t really understand, how to escalate it with our nurse in charge, because we are still learning. So which kind of like I would say in confidence, I’m building on my confidence and when I’m on my next placement it’s really going to be of great impact on me, you know. I know what to do and I know when to, you know, I know the boundaries” (Student FG2)

The student above referred to increased confidence and that was clearly the biggest impact by far from the SIMS week according to staff and students. This could be understood in terms of increased confidence in handling communications with patients, asking for support, dealing with handovers and increased confidence about going into placements. One student referred to feeling more confident generally:

“I am getting more confidence about a lot of things, especially with the complication and the documentation of the job, because when you go to the placement sometimes these things become a reality and they expect you to know when diabetes 2 is happening, what do you want to give to a diabetic patient, which I already know about insulin. I know how to do, how many times you need to do the observation for the ECG,¹⁰ how to record it, if it’s below 3, what can you do and what if it’s 4 and 7, do you need anything. So coming around, for me I would say I am enjoying myself.” (Student FG2).

A student explained how they felt more confident that they were ‘doing things by the book’ after SIMS week because learning in placements could sometimes be a bit haphazard especially in the context of the staffing crisis.

“ I think it’s a good way to learn how the things are to be done, because in the work environment, in the hospital in many ways it can be done differently due to different circumstances, short staff, very little time to do things and nurses tend to do things in a slightly, their own way, you know not as the book let’s say. And it is very important for us to

¹⁰ The use of ECGs was not included in SIMS week activities for first year students but this student maybe referring to experience gained in placement.

know how it is to be done, so we know that we are doing everything correctly and not you know and following the guidance as it should be''.

Interviewer; Okay so you feel more confident that you are doing things sort of by the book.

Student: ‘ ‘Yes because sometimes they didn’t have much time to look after us, let’s say, because it was a really busy environment and sometimes you do have questions and you want some explanation, but there is really nobody who can give you the answer. It’s just, there is no time and it’s really understandable, it’s like it’s okay, but you had people here who can give you this advice, who can tell you where to look, what to look for, because sometimes you don’t really know what are you looking for. It’s like, it’s so much stuff and especially the simulation with a real patient, it’s like eye opening’’. (Student FG2).

In summary, it seemed that most students felt they had increased their skills and professionalism during the week but above all they felt that their confidence as student nurses and especially their confidence about going into placements had increased greatly.

5.14 Non-Participant observation

The week’s programme included two days online learning activities and three days of face-to-face activities (see Table 1: SIMS week schedule). Participation was voluntary during a period of self-study on the students’ curriculum. Programme Directors were asked for lists of students to attend who might benefit from skills teaching. It was emphasised that to benefit from the week’s activities, attendance was expected all week. There was a core group of 20-27 who did attend out of 45 invited to join the simulation week, although student attendance did decline over the week.

Students were expected to log into the online days at 09:00 and attend for the whole day (until 16.00). attendance at the face-to-face days was from 09:00 – 16:00. There was a train strike on the fourth day of SIMS week (Thursday) was much lower than expected.

Each day started with a ‘pre-briefing’ session which recapped the previous days’ activities and gave an overview of the activities over the day to come. Online days were set up to run as whole group activities using online materials with whole group discussion, and small group (breakout) sessions with activities groups worked on prior to reporting back to the whole group afterwards. Activities included an online padlet and patient scenarios written specifically for the day by the lecturers. The learning online was structured so that, for example, the padlet was used in a simulation exercise led by the lecturer, then students were allocated to in breakout groups to complete learning tasks before rejoining the whole group to present key points from their discussion and experience of the set tasks.

Face-to-face days were held at StoneX in clinical simulation wards and classrooms. Days started for students in a classroom for an introduction to the day followed by activities in the simulation wards with debriefings in the classrooms.

5.14.1 Participant observation data collection

Students were asked to give their permission to be observed in teaching sessions. Members of staff were also invited to give their permission to be observed during delivery of teaching sessions. These observations involved three researchers at different times observing teaching sessions where the simulated scenarios were shown and making notes. It also involved researchers observing other teaching sessions or activities during the simulation scenarios week such as introductory sessions and debriefing.

The objective of the observation was to evaluate student and teacher interactions, and students' learning experiences in relation to the use of simulated learning. The purpose was NOT to evaluate teaching styles or proficiency. The same approach has been used by Allan in other studies into student learning (O'Driscoll et al., 2010; Allan et al., 2018). Drawing on Spradley (1980) we adapted a participant observation schedule which was approved by Middlesex Ethics Committee (see Appendix 3 Participant observation schedule).

Table 21: Non-participant observation - Pattern of data collection

Day	Mode	Lecturers	Students	Field	Hours observed
1	Online	2	27	Adult, Mental Health, Child & Young Person	6
2	Face to face	5	16	Adult, Mental Health, Child & Young Person	7
3	Online	2	26	Adult, Mental Health, Child & Young Person	7
4	Face to face	3 (and 2 technicians)	8 (am) ¹¹ 10 (pm)	Adult, Mental Health	5
5	Face to face	6	15	Adult, Mental Health	7

¹¹ A day of industrial action by train workers reduced attendance in the morning.

5.14.2 Analysis

The observation sheets were entered into NVIVO for analysis. Notes were coded and then thematically analysed. Two themes and three sub themes were generated.

Table 22: Themes derived from observation data

Themes	Sub themes
Simulated learning	Student engagement
Ambiance/barriers	Leadership for learning
	Peer learning

5.14.3 Findings and Themes:

The themes which follow were elicited from analysis of all the participant observation data, that is from data observations during online and face-to-face teaching and learning. The aims of the week above meant that the pilot week was designed as a whole (with online and face-to-face teaching days) to allow for different modes of simulation exercises to integrate learning for students. Students were able to integrate learning across the online and face-to-face modes and the simulation exercises while different in each mode, some lower fidelity (online), some high-fidelity (face-to-face), evoked meaningful learning. We present the themes as extracts of data which are divided into online and face-to-face sections which act to reinforce the general point, that simulated learning is meaningful and assists students to integrate learning across different contexts.

5.14.3.1 Simulated learning: online

The following observations were made by one observer about students' learning from simulated experiences on days one and three (online learning days):

Students appreciated the discussion in groups. Felt they had had a good discussion. A student described herself as being judgmental in her first placement and what she learnt from it: 'Reflection helps us enter clinical practice; Professionalism and not be judgmental' (observer notes)

Further direct quotes from students are shown in Fig.3 below.

Figure 3: Selected quotes from observation data



It was noteworthy to one observer, who is a teacher, that the students' reactions online seemed genuine i.e. they showed emotion and empathy for the patients described in the scenarios or seen in the videos in the simulation exercise. These reactions indicated to the researcher that learning was taking place as a result of the simulation. The researcher noted in her observation notes that:

‘Students reacted to the video and audio scenarios ‘I was confused on listening 1st time and then I realised...she was hallucinating’; ‘good to hear the patient rather than nurses/doctors’; Group 3 said re: pulse rate, ‘oh my god, it was high...’ ‘oh wow, we have to call the emergency team..’ (observer notes)

Many of the exercises were scenarios/videos which were challenging to discuss both in small and whole groups. As the resulting discussion showed they elicited an emotional response from students. In the following segment, where the researcher records student response to Scenario 5 (gender reassignment) on day one, this is vividly shown:

‘two expressed shock, literally gasped as it was read out.... ‘non-judgmentality. We should use non-judgmentality in our notes, compassion, empathy...that’s what she’ll want us to say’.. Safeguarding brought up. Capacity also. Challenged each other here. 1 student emphasised how different culturally they felt in respect of capacity and asking children instead of patients, ‘in this country, they ask my daughter who is 12 rather than me her Mum’’. (observer notes)

It is clear in this extract that the students are struggling with how to react (*what she’ll want us to say*) as their shock is palpable (*literally gasped*). Their discussion led to in-group challenge however as they processed their reactions. The quote at the end shows how this scenario enabled at least one student to

think about the scenario in cultural terms (*in this country....*). This extract highlights how effective the scenario and the simulated learning was for these students. Their responses (see data extracts from the observation notes in Box 1) show that emotions were directly elicited from the simulated experiences. We can see in Box 1 in this interchange between the students, which takes place after small group work (in breakout rooms), how seriously engaged the students have been in the scenario which was about racism a nurse encounters from a patient:

Box 1

Scenario 2:

One student uses her own experience to understand the scenario.

One student mentions techniques to de-escalate the situation.

Another draws on her experience of racism.

Another says being humane treating patients humanely keeps people calm.

All the debriefing sessions (online and face-to-face) which are an integral part of any simulation learning experience, aimed to discuss the learning with a focus on how students felt while they learnt. The observer noted that the

'debriefing session lecturer explicitly asks students to focus on learning through sharing responses to simulation. Students are specifically asked, what was challenging? We discussed racism, dyslexia, communication, cultural difference. How do you feel after today?' (observer notes)

In the debriefing session on first day (online) one student said:

'I've learned as a nurse I'm accountable and when I'm on placement, if I don't feel competent, like in the scenario, I would say I don't feel competent. I've learnt how to escalate issues (like the racism scenario) and it's still part of your duty to attend to the patient''.

Another student said in the same debriefing session on the same day:

'The case study with racist lady (1) ...my 1st reaction, I would walk away, I wouldn't want to escalate the situation. Now after listening to you, I'd get on with my job. Be professional. And also to talk slower''!

5.14.3.2 Simulated learning: face-to-face

If anything, the emotions noted above which were evoked through online simulated learning were even stronger during the face-to-face days during the pilot week. Students worked in small groups in clinical simulation wards (or in one exercise, the Nursing Olympics) across multiple classrooms, supervised by two

or three lecturers. The ratio for the three face-to-face days varied from 1 lecturer to 3-10 students. This high level of supervision meant that lecturers could observe and give feedback frequently. The observation notes show this:

Lecturer explicitly linked theory/practice and questioned them too.

Move to next station in different classroom. Next student introduces station, moving & handling (moving patient from bed to trolley for theatre). Students seem more confident. Lecturer praises. Lecturer questions and directs to best practice. Lecturer 'calls out to porters' to heighten simulation. Lecturer continues to question students as they perform the station. Students play around with equipment (raising bed, moving sheets). Lecturer corrects moving/handling. Students self-correct themselves and each other. Lecturer summarises, 'is this ringing bells?'

The high-fidelity of the simulated learning was summed up on day 2 in the week which was the first face-to-face day when a student reflected on how disintegrated her learning had been across university (classroom) and clinical practice:

'I'm enjoying this. In hospital, you don't get practice. Especially handling when we did that (in classroom) I didn't get it'''.(observer notes)

Another important aspect of face-to-face teaching of psychomotor skills in practice disciplines is the hands-on nature of skills acquisition, the learning through doing (Allan & Evans, 2022); this is also described as embodied learning (Allan et al., 2018; Allan & Evans, 2022). As one observer noted:

Lecturers are experts and convey how to learn the complex skill of using the sphygmomanometer 'feel with these two fingers, they're more sensitive; you'll get used to handling the syphg'

Taking a blood pressure is a difficult skill which students struggle with, theory, practice and linking theory/practice through their senses (hearing). They need time to learn this and appreciate learning this in simulation days'''.(observer notes)

Other comments expressed by students after face-to-face simulation exercises show they appreciated working and reworking with the technology and practising communication skills (see Box 2 below).

Box 2 (student comments after face-to-face simulation exercises)

We had this lesson before and it's nice to have a chance to practice. I wished we'd had this chance before we went on clinical placement.

You can't always get it right 1st time, we've come back to it and cover it again.

1st time we done it, it was rushed. (BP, urine analysis). It was like a lecture but it was so much information, you were overloaded, it was good to use all of that knowledge. It would be good to have a lecture and then a week like this.

That's why everything now is making us feel more confident. Having a patient, handling them, handling stuff, makes you feel more confident.

5.14.3.3 *Student engagement: online*

Students appeared to the observer to be actively and emotionally engaged in learning. They were laughing, were sometimes shocked (as in quote above), talked to each other and were not reticent in giving opinions about the scenarios. The observer noted on day 1: *The large group discussion showed they were attentive. They seemed to want to speak and have their say to develop the discussion.*

Box 3 (observer notes)

Scenario 3: (a patient scenario has been read by students) one student's (MH) reaction was calm, logical, evidence based, concerned with safety.

Lecturer entered the breakout room and probed their discussion further. She picked up on the two students who weren't saying anything. One student described her learning from others' experiences.

A long pause after scenario 3 – 3 minutes as 1 student made notes on padlet – before renewed discussion where two MH & one Adult students discussed best practice. Asked each other questions but not CYP student (the groups were mixed field as far as possible to encourage shared principles for practice).

Scenario 4: (dyslexia). Another pause after one student says she is doing the dishes. Then silence for five minutes. No attempt made to go back to it in this small breakout group before the students are called back into the whole group chat.

3rd student (who was washing up) comes back and joins in again. Interesting discussion about boundaries (which one of the silent students joins in on). Does this draw on their experience? Again, they talked a lot about disrespect (as they had with scenario 1 [racism]). I wonder whether they're drawing on their own experience here?

They 'finished' boundaries and thought they had to go onto 'debriefing'. Then silent student told them they had to wait to present back to larger group.

Several times one of the students taking the lead would say, 'hello, hello' hello'.

Under barriers to learning, we come back to digital inequity in online learning.

However, as in face-to-face teaching, online teaching cannot guarantee equity of learning across a group of students as the following observations show:

“Students were engaged but only 2/3 interacting and doing task in group 1.

In group discussion, more had their cameras on and there were plenty of volunteers to present feedback”.

The long data extract in Box 3 shows how engaging the online simulations were in part but how difficult it was to ensure learning was fair and consistent across the group.

5.14.3.4 Student engagement: face-to-face

In both online and face-to-face sessions, students drew on experiences from their clinical placements. However, with the closer supervision that was possible in the face-to-face sessions, students appeared more able and willing to draw on these prior learning experiences and use them in the simulation exercises.

“Lecturer starts asking students theory/practice (about process of medications administration). Students responsive. Lecturer probes their answers. Lecturer works through medications chart. Students ask their own questions prompted from practice which they’re struggling with. Lecturer responsive to students’ questions. Encourages them to ask questions in practice. Students actively learning and drawing on clinical experience to ask questions in simulation”.
.(Observer notes)

This engagement in learning is evident again in the next extract. Another point from this extract which was reinforced throughout the face-to-face teaching was that learning in simulation wards gave students the opportunity to make mistakes and thus reinforced learning.

“Students seem engaged and asking questions, responding to questions. Lecturer relates to a student response: ‘wrong answer’ lecturer says again, ‘don’t worry, that’s why we’re here. Every answer needs to be said and explained if wrong”.
.(Observer notes)

Making mistakes was reinforced constantly during the face-to face teaching and simulation exercises as we show later in this section. the opportunity to make mistakes is fundamental to learning in practice disciplines (Brady, 2013).

5.14.3.5 Peer learning: online

The observer noted that peer learning was a prominent feature of the learning online. Students seemed to respect turn-taking in the small groups and communicated effectively. The observers noted their respectful communication many times in their notes.

Box 4: Observer notes

Again smiling, laughing, clapping each others' efforts. Laughing at each other and with each other. Learning through mistakes which lecturers emphasise is safe and purpose of the Sims ward.

Pair practising BP on each other. Student A having her BP taken says 'ouch that's hard, it's pumped up high!' Her pair (B) pays her no attention as she's engrossed in listening to the BP through the sphyg. B tells A her BP who says, 'hope it's not too low' (evokes real BP). B redoes her cuff and BP.

A says, 'felt I was going to faint!' (evokes experience of having her BP done). Afterwards I ask, how was that? B says, 'I could hear. It's the diastolic. I'm never really sure if I hear it'.

Peer learning was evident in the way students in small groups took it in turns to keep to task as the observer noted:

1 group begin to drift and chat. Lecturers not picking up – 5 minutes mostly because engaged in supervising two other groups. Student calls group to order and asks for help which gets them on track again. 'can anyone help? I don't really know what I'm doing!'

Bed 4, new pair, 'no no no. we wanna listen to it properly don't we'. Self-correct BP taking. 'there we go...'

Peer learning bed 2 – lecturer observes/supervises 1 student. Then this student teaches 2nd student.

"The online activities appeared to develop communication skills as observed by the researcher. Students reluctant to talk to each other in breakout groups. Students seemed focused once they'd understood what they were expected to do and how to use the Padlet. Padlet was completed quickly and students struggled if asked to slow down. One or two students led each group. Respectful. Some struggling with the technology is a barrier. Students' willingness to support each other facilitates this. Sense of uncertainty about the task, some are struggling with the tech, some are more fully engaging. Some take the role of helper of others". (Observer notes)

'Students and staff appeared patient with technical glitches and worked to sort them out, often with students assisting staff as this observation note illustrates:

"Tech problem: During group work, lecturer is (suddenly) audible across the groups speaking informally. The students, in the small group, say this is distracting and spend time discussing how to deal with it. After the groups finish some students tell her about it in the large group. They are assertive enough to bring up this potentially embarrassing situation. Lecturer reacts well to this feedback and says 'we recognise and value everything you are doing today'. (observer notes)

5.14.3.6 Peer learning: face-to-face

Pair work in face-to-face simulation exercises was valued by the students and was an opportunity for them to practise skills as this long extract in Box 4 shows. .

Ambiance: online

Generally, the student groups settled into a joint engagement with the material though the observer noted that the technical equipment was a barrier as trying to sort out glitches takes up time in all the groups. As this observation note records:

Students losing connection and leaving/rejoining zoom –video whole group are watching has to stop while this is going on...often [students] said that they were confused either about the material, the required task or an aspect of the tech and others helped them. Those groups with no cameras on – the students seemed happy to converse and work together without seeing each other. Are they used to this way of working by now? (Observer notes)

The observer's last comment (are they used to this way of working now?) poses an interesting question about the quality of the learning conducted online. The observer goes on to note that the

'learning seems hit and miss but not as hit and miss as clinical practice. Not everyone speaks so not everyone vocalises their learning experientially and thus the opportunity for simulated learning is not always taken advantage of'. .(Observer notes)

Again, at a later point in the observation, it is noted that: *"Learning online seem disjointed. Students have their videos off and are mute so it's disjointed as each students speaks"* .(Observer notes)

It was difficult to maintain a good ambiance for learning in these conditions and while the lecturers tried valiantly and patiently, there were many long pauses and silences.

Ambiance: face-to-face

In face-to-face teaching sessions, the whole day was a simulation. Therefore, students were treated as members of the nursing team. The observer noted:

"Clear instructions. Friendly. Practice focused and encouraging. Questioning continuously. Professional and friendly. Lacked hierarchy. Fun. Brisk" .(Observer notes)

Students were constantly questioned about what they were doing with the manikins and why:

"Then 1 student takes Pulse rate of another student. Student can't feel it and lecturer says, 'sometimes you can't. it's a deep pulse. okay I can't feel it. What should I do now?' 'I can feel it now, it's deeper and you need to take time'. Student then feels for it and counts with lecturer observing. Then once the student's counted it, lecturer explains about 'normal' pulse, MEWS score and what they should do. She's linking theory/practice. Questions them about theory" .(Observer notes)

Box 5 (Observer notes)

Moves to next station, Blood Pressure using a manikin. Lecturer demonstrates using a sphygmomanometer on manikin. Specifically asks students to link theory with practice now on manikin as she demonstrates taking of BP. One student completes BP. Lecturer reassures student who lacks confidence and appears a bit uncomfortable and clumsy. Lecturer emphasises psychomotor control. Gives tips on how to become more skilled. Student succeeds. Lecturer praises student. Then explains more about how to take BP. While lecturer explains how to take BP skilfully, students are engaged and questioning.

This questioning of students which allows continuous linking of theory and practice, in other words, integration of learning, is possible because the student is face-to-face with the lecturer and being observed as they reinforce learning of a complex psychomotor skill. Skills acquisition depends on recontextualization of knowledge (see Allan & Evans [2022] for further discussion):

The observer who was a clinical teacher and nursing tutor in the 1980s, reflected that:

‘‘this is very much like old-fashioned clinical teaching. Giving time to patient care but teaching at the same time through the care’’. (Observer notes)

Barriers to learning: digital inequity

Digital equity was perhaps a greater problem than the focus group data suggested. Not all students had access to laptops and therefore could not open materials on which the session was based. Some students were using their phones and couldn't always access the materials, e.g. being able to hear audio when watching the videos to the groups. Others were unable to engage with learning because of other commitments:

‘‘One student had a child with her (heard as her camera wasn't always muted – she was actually one of the active students)’’. (Observer notes)

It was clear to the observers that online learning technology could be a distraction from learning and there were differences in individual student engagement:

‘‘Occasionally the connection was poor and the sound awful which made it difficult to follow. In group work, students struggled with IT and therefore focusing on the work. In group 1 it took 10 minutes to start because of this. Lack of videos seemed to prevent discussion, as students tentatively asked if the others were listening’’ (Observer notes)

Students seemed to vary considerably in their IT skills. Those who did not know (for example) how to share their screen could slow a group discussion down significantly as noted by the observer: *"many students don't have cameras turned on so when they speak in the large group it feels disjointed"*.

Observers noted that lecturers were bothered by students not turning their cameras on while attending online. This was commented on many times and students were requested to turn their cameras on throughout the two online days. One lecturer described this as *'not knowing about digital learning etiquette'*. The oddness of virtual groups' silence and blankness (cameras off) was noted by the observer: *Another silence after this scenario while notes are written for feedback. It feels very odd if no-one's speaking and there are no videos on.*

One student expressed her exasperation (we're talking to ghosts):

"Finally group I put on their cameras at the request of one student, 'please, please could we put on our cameras so we don't feel like we're talking to ghosts'. Three out of the five students put on their cameras". (observer notes).

In quiet periods between teaching, lecturers debated whether quietness of groups was due to students being first-years, and therefore lacking confidence, or whether it would be better to start face-to-face instead of online. Lecturers managed this well, as the online platform allowed them to observe participation in groups and to 'visit' groups to support discussion, much as a lecturer would in a real classroom. The observer notes recorded:

"Students reluctant to join in breakout groups. Lecturers had to encourage to participate. Participation varied in groups and lecturers supported as they could. Reinforced learning opportunity of break out groups. Students found it difficult to follow instructions. Broadcasting interrupted the discussion in groups"
(Observer notes)

Leadership for learning: online

As in face-to-face teaching and learning, the lecturer or teacher is key to structuring and facilitating the learning. There were two main lecturers and several assisting lecturers. Two of the key lecturers who were present on both online days had designed and written the lesson plans for these days. They were actively engaged in teaching and facilitating learning on both days as the following observation notes records: Lecturer asked for general feedback and then focused on each element of the padlet. They targeted students who hadn't said anything during the breakout groups. E.g.: learning from MH students and MH perspective.

Both these key lecturers led teaching and were observant about student participation. They reinforced learning, integrated teaching on different days during the week but also across the curriculum.

Lecturers started by assessing where students were in working through the learning task in breakout groups. Students asked questions.

Box 6 (Observer notes)

Lecturers set up feedback after groupwork.

Students came back to the main room. More students had cameras on.

Lecturer led feedback by scenario with each group presenting a scenario.

It was obvious students hadn't completed all the task in the breakout small groups:

One group (3) hadn't been able to work through their scenario and lecturer was positive and said, 'right, we can do so now'. The lecturers all seem endlessly patient.

In the exchange described in Box 6, one of these lecturers manages feedback in the whole group after breakout small groups effectively, and patiently.

In Box 7, the lecturer's skill is again evident as they draw out reactions from students which show their learning has been powerfully meaningful.

Box 7 (Observer notes)

After video on safety checks, the lecturer asks, how do people feel after today?

Students: I've really learned a lot;

how we communicate with patients non-verbally

how to be helpful and useful on placement, I can know how to escalate;

I can now see the theory behind what I've been seeing;

I never knew what it [safety checks] was and I know now. How to talk something through with the patient...how to compose yourself professionally....he was calm, professional...hopefully I'll make use of that when I'm in practice; by listening to video on prioritising care..before I'd thought 'what are they on about' ...today I understand it's about people's critical condition and the decisions I make;

Leadership for learning: face-to-face

As noted above, lecturers were skilled at facilitating learning. They explained the structure of the week at regular intervals during the online and face-to-face days, they integrated learning across different modes (clinical placement, university and simulation) by asking students to reflect on their clinical experiences during simulated learning. One lecturer encouraged students to prepare for each day by reflecting what they'd learnt, look up what they didn't know and learn one fact a day. In face-to-face days through the high lecturer to student ratio, the lecturers facilitated a safe place for learning:

Box 8 (Observer notes)

Next station, SBAR/urinalysis. Lecturer asks who lacks confidence and chooses that student to present the station. This I think is new to them. They've had lecture on urinalysis and lecturer reminds them and asks them questions from this.

When student answers wrongly, lecturer reminds them 'that's why we're here (to make mistakes)'.

Another mistake and lecturer repeats, 'that's why we're here (to make mistakes)'

Reminds them throughout stations of escalating patient information for patient safety. As lecturer explains urinalysis she's testing their knowledge, recontextualising of knowledge and their confidence in knowledge and learning. Students then start to test 'urine' (actually water with dye). Again lecturer emphasise skilful practice. She ensures the least confident student tests the urine (or self-assessed least confident).

Student asks how many times they will practice injections. Lecturer reassures that Thursday and Friday are about practicing skills in simulation wards. This is linked continually during the SIMS week by lecturers saying that 'students are here to make mistakes'. For example, in Box 8, the observer noted that safety is also created through the lecturer emphasising that students can learn through making mistakes.

Summary of findings from the participant observation

Overall, the data from the participant observations showed that using different simulated scenarios, students could immerse themselves into a situation where they could explore their feelings, absorb knowledge and practice skills they may encounter within clinical practice.

The blend of online and face-to-face learning over the week of the pilot appeared to the observer to lend itself to integrating learning and lecturers continually reinforced the learning themes from day one across the online and face-to-face learning modes. A constant refrain from the lecturers was that simulated learning allowed students '*to make mistakes and learn from them*'.

Emotions are integral to learning (Hokka, 2017; Allan 2011). Understanding emotional learning psychodynamically or as Fabricius (1999) suggests, through learning to work with feelings in nursing practice, allows the nurse to recognise that feelings shape learning both consciously and unconsciously. Feelings are the fundamental basis of learning for students and nurses as they learn from interactions with patients, their families and colleagues and they shape interactions and therefore learning. The simulations experienced over the week, both online and face-to-face, evoked emotional reactions from the students which were observed and recorded by the observer. There was also time built into the week's programme for prebriefing and debriefing.

5.15 Prebriefing sessions at start of each day

These sessions of around 30 minutes were the start of each day's activities. Many students joined the prebriefing late and perhaps it was not viewed by students as a full part of the days teaching or activities per se, as it should have been. There was a train strike on one of the SIMS week days (referred to in data extracts in this report) and attendance generally declined over the week. Some extracts from the observer's notes in relation to prebriefings are given below.

‘Students slow to join the first online session. 1 student joined 40 minutes later, 2 joined at 80 minutes, was assigned to group. There seemed to be confusion over whether some students were to join [SIMS week] as this is a pilot. Students also were late in joining. One or two had appointments. Introductions were clear and friendly. First ice breaker was good one followed by general introduction by lecturer to simulation, week's teaching and pilot. Timings of the day and start times of the week. Instructions about attendance. Then followed an introduction to session 1’. (observer notes, online day 1: AM)

.....

‘(face-to-face) Introduced in main classroom then split into groups. Waiting for students to arrive. DoPs (Director of Programmes) have had to emphasise the importance of attending to students when selected for the SIMS week. Lecturers disappointed by poor attendance i.e. 27 or so yesterday (1st day) out of 45 selected, 16 today. Set up in rows, friendly. Welcome for SIMS week. Staff introduced themselves. All students asked to introduce themselves. Topics of the day were introduced: SPAR, Obs, communication, prioritising care. Lecturer referred to Code, respect, simulation meant making mistakes was safe, respectful communication’. (observer notes, online day 2: AM)

(online) Lecturer puts up the link for a poll ‘to find out about how you are feeling so far’. The results come up in real time and lecturer says it's good that it is so positive. Someone calls out ‘passcode please’ 2nd lecturer says ‘Listen, I've got two computers here, just give me a moment. Can you please be patient’. Short discussion on communication from poll results. Issues are that without cameras student voices come out of nowhere suddenly, sometimes interrupting when they speak. Attendance is another issue in the poll. Students say that various strikes will make it difficult for them to attend on Thursday. There is some to and fro about this. Lecturer says it's individual student's responsibility to decide about attendance. One lecturer says that arriving on time is part of the profession ‘you just need to think about [these] things’. There are many requests and negotiations for leaving early or for part of the session because something else has been scheduled. The session starts at 9.50 after this. At the start of the 1st session, lecturer encourages the students to turn on cameras. One person does’. (online day 3: AM)

‘Again, day starts with lecturers and students gathering for prebrief. Train strike today. Lecturers disappointed by attendance all week and today is worse than it has been all week. Partly worried because activities may not work with small groups of students. Only 3 CYP {students}. (face-to-face day 4: AM)

“Once the students are assembled, lecturer introduces the day’s activities including the debriefing at the end of the day.. Recaps on teaching (not learning as she doesn’t ask the students) from yesterday (day 3), especially video on safety checks, injection technique, communication, meds management. Several students hadn’t attended online for this week (prior) and the video yesterday set up the learning for today. Five out of the eight students attending today had been online yesterday and seen video. Lecturer said to those who hadn’t been online, ‘you’ll learn from your colleagues’. Then explained that today’s sessions are in the Sims ward and students will be divided into fields of practice (adult, MH, CYP). She emphasised a few times that ‘the opportunity to Learn from your mistakes’. She introduces each of the 4 patients on the ward. Lecturer appears to be modelling handover at the beginning of a shift”. (online day 4: AM)

“Rather later starting today. Again anxiety over numbers of students. prebriefing meeting with whole group to set up day’s teaching. Rather awkward as the session is a meet and greet with no teaching. Anxiety with low numbers and straggled arrival times. Made more awkward as numbers of lecturers relatively high 6:15 students with 1 observer teacher). Prebriefing held in main room. Brief, focused mainly counting numbers of students. No teaching (recap or directions) as such”. (face-to-face day 5: AM)

Debriefing explicitly allows lecturers to focus on feelings experienced in learning (and thereby integrate learning) and encourages students to process their emotions from the experience. These debriefing sessions themselves drew on prior learning about reflective practice elsewhere in the curriculum and students were adept at reflecting on their learning. Lecturers appeared skilled facilitators of learning through emotions. The debrief following the scenario allowed the recontextualisation of theory to practice.

Peer learning in both online and face-to-face simulated scenarios was observed by the researchers. Students processed information together, problem solved in pairs or small groups, came to shared decisions, led their peers where there was uncertainty in both technical and non-technical skills. Students drew on existing knowledge and understanding by working through scenarios within timed frameworks supervised safely by skilled expert teachers. The manikins and actors appeared to increase the fidelity of the simulation.

Simulated learning scenarios showed that students demonstrated correct technical skills and their ability to escalate and handover appropriately the scenario, and where unsure, felt safe enough to repeat the skill until they felt they were more confident. Blood pressure reading and handling of the sphygmomanometer was one particular skill many students commented was difficult to learn in practice and they appreciated having time to repeat this skill in the scenarios and on each other.

5.16 Debriefing sessions with students at the end of SIMS week

The teaching staff (clinical skills team) carried out debriefing sessions with students at the end of each day of SIMS week. The researchers observed two debriefing sessions on the last day of SIMS week, lasting an hour each. Staff saw the Debriefing sessions are a key part of simulated learning as they allow students to reflect on their learning with the aid of the lecturers and to consolidate or reinforce learning and potentially to make links between theory and practice. The briefing was further enhanced by the presence of the actor who had taken part in some of the scenarios, who and gave her feedback on the 'care' she received. The evaluation team sat in on the describing sessions as non-participant observers and the notes from these meetings between staff and students were analysed and the key themes are represented here. The first two themes (realism and confidence) mirror those derived from the focus groups but there are two new themes (what students will take into practice and communication).

5.17 Realism

The students were clear that the realism was greatly enhanced when actors were in the scenarios as opposed to manikins, although both offered degrees of realism. One student highlighted that the presence of the actor had enabled her to develop confidence in communication skills

“It made a big difference. It was as if like you were in a real ward with the patient. I think it's more better with a real person than a manikin, because it makes you feel more confident. Me, I have a problem like I was too shy of communicating, because I've never worked in the medical sector before, My fear was communicating with the patient, but as time goes like it was normal, like I'll go, how are you, my name is {student name}, I'm a student nurse, is it okay if I take your blood pressure.... and I'm like see this as a human being you are dealing with, so I can overcome my fear. So I think this whole thing is quite helpful for me” (student in debriefing session)

And another student explained that developing communication skills with a manikin was far less natural:

“I think because me I've never, because in my head I find it crazy to talk to a manikin or something like that, it isn't a human being and I've never done that before. So I was like how am I going to be talking to this manikin, obviously he cannot even hear me. That is, it's just the, how do you call it, the mindset, like it's not a real human, but today I was like do you know what I need to take, because yesterday with Patricia, I was, when I heard the doll speak I nearly fell down, because I wasn't expecting it. I was like what the hell was that!” (student in debriefing session)

5.18 What students think they will take into practice from SIMS week

There were a number of comments and exchanges about what students would take into practice from SIMS week. Students had a placement starting the week after SIMS week.

5.18.1 Confidence

Several students mentioned feeling more confident as a result of SIMS week. One example was a student describing that as a result of simulating handover she would be more confident in a multidisciplinary team meetings in placements.

Lecturer: Okay. What about doing that ESPA handover, talking it out and ...?

Student: 'I liked doing that, I enjoyed doing that, like pretending to do a handover today. Because I feel like even when I was on placement and I went for an MDT meeting with the ward manager and I felt like at the time there was things that I knew about patients as well that I could have contributed to, but I just, because I had spent so much time with these patients and more time than the doctors and other people and I didn't really have the confidence to say it in the team meetings. But having, being able to do a handover was something that I, it was like always on the tip of my tongue, like I always wanted to sort of say something and now I feel like I would be a bit more confident''. (student in debriefing session)

Several students agreed that they were feeling more confident to volunteer to demonstrate their in placement and to escalate issues to their practice supervisors where appropriate and there were many comments about going into placement with real confidence. Several students also mentioned developing an improved understanding and improved confidence in relation to handovers.

'For me I feel like it's more easier today than by myself, because it makes you think more, because when you have two people you want to rely on the one person, like on the next, so for me it was okay. You just had to like do your plan and know I need to do this, I need to do like and then always be on time, that's the only thing, but I think it was fine. At the end of the day I'm going to be in a ward with one patient, so it's not going to change anything from yesterday. It makes you think more independently, not relying on anyone'' (student in debriefing session)

Some students indicated useful learning in discovering that procedures and abbreviations in relation to handover could vary significantly across specialisms or clinical areas.

5.18.2 Other things which students felt they would take into practice:

A small number of students mentioned the learning which they would take into practice including better organisational skills, developing a more holistic perspective and 'questioning everything' more (which again might be seen as an aspect of having developed more confidence).

'I think personally for me it's to question everything, because there were a lot of things that, even though you had different scenarios to work on, I didn't understand, especially all the abbreviations that we had. And actually that's what kind of made it clear today that some abbreviations are different, in different hospitals and different wards. So I think it's, to me, it's not that I feel bad that I don't understand this, it's encouraging me to learn more, so that I

question it and I will be informed about what A, B, C, D is, so that I'm confident in practice. So I think it's always questioning and also getting to know why'' (student in debriefing session)''.

5.19 Communication

Students referred to improved communication skills, in a variety of contexts, as something that they would take into practice. One of these was establishing and maintaining communications with patients in difficult circumstances when they maybe tired, hungry or in pain.

Student:: Little bit about history notes of patients,,, maybe she has been mobile, we tried to make her comfortable.. negative feedback..tried to make sure the line of communications is there, ,not to react to negative behaviour form patient. (student in debriefing session)

Another example was communications skills in liaising with patients' families and other health care professionals

''Yeah bleeped the doctor, family is here, we need to do a family meeting to discuss her care going forward and how the family can be more involved. They can bring her food that's fine, just make sure that you guys aren't feeding her and wait for her to feed her once we've finished with everyone else. Yeah it was pretty much the same''. (student in debriefing session)

Another example cited was an improved understanding of how to be clear with patients, avoiding jargon or abbreviations:

''So like being so clear about what it is that you're going to do, what like, even when you're saying like, oh we're going to give you medication, but how are you getting your medication. Like I mean do I take something, is it an injection, like and yeah just being so like clear with what you're saying, because it's like, it can be, yeah I have no idea what is going on, so if you're confident and seem like you know what you're doing, even if you don't, it's going to feel so much better as a patient''. (student in debriefing session)

Students mentioned being sensitive to what patients could hear or overhear, the need to identify oneself clearly to the patient and having one's badge displayed clearly on one's uniform.

5.20 Staff focus groups

Two online focus groups (pre and post SIMS week) were carried out with staff who planned and delivered the SIMS week, with six staff attending each focus group. A one-to-one interview was also carried out with a senior member of the nursing and midwifery department. The themes generated from the focus groups and interview were:

• Aims and objectives of the SIMS project • Importance of realism • Pressure on staff • Training needs of staff • Pedagogy • Outcome/impact of the project	• Safe learning environment • NHS as a learning environment • Integration of SIMS into the pre-registration programme • Lessons learned
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These themes are described and illustrated below.

5.20.1 Aims / objectives of the SIMS project

The SIMS project at Middlesex University was funded from a Health Education England (HEE) grant which Middlesex ACM applied for and was awarded. £10,000 was made available to develop up to ten scenarios. Staff were clear that the university's main immediate motivation for making this application and developing the scenarios was to replace some placement hours with simulation. The NMC has announced (2023) that nursing departments may apply for 600 hours of the required 2,300 placement hours to be replaced with simulation. As one senior member of the teaching team said:

“Yes we put the bid into the HEE to get the money which we knew was around because we wanted to look at producing simulations. Now there is little doubt that simulation is the way forward to teach nurses, but the initial reason that we did what we did, the original bid that we wrote was to get the money so that we could look at developing simulations to replace practice hours” (Staff FG1)

Staff explained that the department has applied for the right to substitute 600 hours of placement time with simulation even though they did not necessarily plan to substitute as many placement hours as that with simulation at the current time, not least because of the expenses and demand on staff time which that would involve.

It was felt there was a lack of capacity from the NMC in terms of how simulations must be designed, in order to be deemed of sufficient quality that they can be substituted for placement hours:

“I think the NMC are quite confusing about some of the things they’re asking for and when I was at the meeting the other day, you know that was one of the comments that people made, you know what is simulation, what do they believe, you know one minute they are saying we’ve got to use actors and then we’ve got to use service users.”. (Staff FG2)

Staff were also aware that other countries were already using simulation to a much greater extent than the UK and there was a feeling that the UK had been lagging behind but that UK universities now had the opportunity to ‘catch up’.

“Compared to Australia and America, they use a lot more simulated practice and less clinical hours and they are still producing good quality nurses. I think there has been this phobia that 2300 hours has to be on the ward, or in the community and I think we are learning, we will make mistakes and I know we’ll make mistakes, but things like this, will allow us to make mistakes safely”. (Staff FG2)

There were several reasons why the university wanted to replace some placement hours with simulation, which included alleviating the university’s difficulty in finding safe learning placements and to take pressure off local NHS partners to provide such placements. A further reason was to do with the increasing difficulty which the NHS faces in providing the best quality learning environment in placements, in view of the staffing crises and long patient backlogs (i.e. the extent of pressure on the NHS makes it more difficult to provide a quality learning environment). Furthermore, the latest nursing curriculum introduced at Middlesex University in 2019 (based on updated NMC standards (NMC 2018)) is seen by some staff as more demanding of students and hence requiring a higher standard of preparation. This is seen to some extent as being more achievable in the controlled environment of the SIMS facilities. As one senior departmental member of staff said:

“ So initially we just wanted to release student hours from practice, so we know there’s pressure on the NHS, we know that we struggle to get placements sometimes, or placements that give students enough experiences to meet the requirements of the programme, in terms of skills. So it’s a way of alleviating pressure, but it’s also about giving students a really enhanced learning experience in terms of clinical skills, where we know we can provide a controlled environment” (Staff FG 1)

In placements, clinical staff have many priorities and there may be a tendency for learning to be seen as less urgent whereas in SIMS, staff are focusing purely on facilitating student learning as is described in this interview with the same senior educator:

‘‘There aren’t additional pressures and you’ve got people who are literally devoted to ensuring a learning experience. They don’t have other priorities, whereas if you’ve got a practice educator, or a practice assessor in placement, yes of course they want to do the best for their student, but that’s one of a huge number of priorities. And if you’ve got other priorities, sometimes you find education is kind of yes, yes, ... is not the priority, there is too much else to do’’.
(staff FG1)

This same educator emphasised the benefit SIMS in being able to simulate rare or complex clinical situations:

‘‘Yes absolutely, you know the range of experiences that students are able, are supposed to be able to deal with, you can say they’re reasonable, but there’s no guaranteed that students will necessarily come across these situations and if they do, if they haven’t been in those situations before, the chances are they would be pushed to the back, you know you just go and look. Whereas in a clinical skills lab, we can create, particularly emergency deteriorating patient kind of scenarios and actually say to students, no, you step up, we’ll be behind you, we’ll make sure you’re safe, and we will also give you a chance to reflect afterwards’’ (staff FG1)

Some further benefits which were hoped for, both for the university and local NHS workforce, were to reduce student attrition and workforce attrition – to the extent that students feel more confident about going into placements for example, then the less likely they should be to drop out of the programme and to the extent that they are better prepared for entering the profession the less likely they are to drop out of it.

‘‘nursing retention is really terrible, nurses are leaving and part of that is down to their confidence. If we can raise their confidence up by doing the simulations really well, hopefully we will start to see nurses not leave as often’’.
(Staff FG1)

It was also hoped that simulation might produce safer nurses and this would be a benefit for patients and the NHS:

‘... if it {simulation} means that our students are safer, that is an incredibly valuable thing, where you’ve got a system that is so under pressure.... the more likely you are that mistakes will be made. So if you can find students who are even more prepared, who are better able to practice safely, that has got to be a benefit’’. (Staff FG1)

It was acknowledged that the evidence was not yet there for many of these hoped for benefits and further research and evaluation will be needed in this rapidly expanding and evolving field.

5.20.2 Importance of realism

Staff were aware of the importance of realism in the scenarios in order for students to be as engaged as possible and therefore for the learning to be effective. Scenarios involving manikins were felt to offer a good degree of realism:

“we were talking about the interaction to the manikin, even though it’s not real, it was a genuine feel of care given to the manikin, because they believed it was a true person with an illness and they were conversing in that way as well”
(Staff FG2)

But staff were also very aware of a hierarchy of realism in that scenarios involving actors were more realistic than those which only involved manikins, even if both were of value. It was noted that the scenarios with actors were more conducive to reflection as the actors could give detailed feedback about how they felt as the patient:

“And I think with communication as well ... particularly actually when we used the actors, in the feedback the actors were able to give to them [students], I think encouraged more reflection from the students, which we obviously can’t get when it’s a manikin, because manikins can’t talk to us”(Staff FG2)

In fact the manikins can and did ‘speak’ in some scenarios, with teaching staff taking on the role of the patient and interacting verbally with the students from the ‘lab’, but obviously it is easier for actor to react in real time and to more authentically portray the patient role.

Staff pointed out that actors can also react in real time to the behaviour so the students, whilst working from a script

“we will be using actors and that’s a nice safe way of having that communication skill and dealing with somebody, who has got a script that they know how to deliver and they can feed off how the student is working. And if the student is being a bit bolshy, or not caring, or not respecting their dignity, they can react like how a proper patient would act” (Staff FG1)

Staff pointed out that while actors might be superior in terms of realism and the ability to react or feedback in real time, actors were expensive and so the university had to make the best use of what they had available:

‘‘I personally think it’s great, if we could afford, we’ve got fantastic manikins and they’re great, but if we could afford to have more scenarios where we were using actors, I think it will make it that more authentic for the students and more real. But yeah, but we utilise what we’ve got’’. (Staff FG2)

The importance of actors to the future development of the SIMS ‘offer’ in Middlesex nursing programmes was emphasised:

‘‘I mean I think if we don’t use actors, we will be an also ran, to be perfectly honest, as far as a simulation centre is concerned, I think that’s the bottom line. I mean I was at a conference on the Health Education England TEL Conference, their Technology Enhanced Learning Conference on Tuesday, there is little doubt that everyone is starting to use actors’’. (staff FG2)

This member of staff also noted that they had been able to find a company that could source a greater diversity of actors (such as transgender actors) but it was an ongoing challenge to fund the hire of such actors. The difficulty of finding actors for CYP scenarios was also noted and that in most cases it was necessary to use young-looking adult actors, rather than children.

5.20.3 Pressure on staff

Organising the SIMS weeks involved a great deal of work for staff, especially the clinical skills team. This was in terms of developing the scenarios and mapping learning outcomes onto them, organising, installing and managing the equipment and actors at StoneX and the students’ participation. As part of the pilot, three weeks were provided in total (one for each year of the programme). The SIMS week for year three and two took place before the evaluation which covered the third and final week of the pilot which was for first-year students. Therefore, the evaluation missed the first two weeks of the SIMS project, during which staff may have experienced higher levels stress as they went through the steepest part of the learning curve.

‘‘for me last week was nice, easy and that’s possibly because I did the Year 3 and Year 2. So if you had asked me about Year 3, I would have probably have burst into tears, because I was so stressed about that. Then Year 2 got a little bit better, because we knew what we were doing and then by the time we got to Year 1, it was it didn’t feel stressful at all’’. (staff FG 2)

One member of staff contacted the evaluation team privately and expressed concerns about the level of pressure they had been under during SIMS weeks and that in their view they had been treated with a lack of respect. However, in the staff focus groups, most staff suggested that they had not been under unreasonable levels of pressure and the team leader highlighted that staffing levels were very high compared to normal teaching levels. However, the fact that the team leader was present in the focus

groups might have made it difficult for staff to be complete open about the levels of stress or pressure they experienced in SIMS week.

One member of staff highlighted that they had had more time to network than usual during SIMS week and welcomed the opportunity to talk to staff across specialisms (adult, mental health, children and young people). The team leader highlighted that they were a close team and were able to pick up if a colleague is stressed and offer them an opportunity to talk. A member of the support team said that while they had not been stressed they had worked very long hours but that this was not a problem as it had been possible to take time off after SIMS week but if SIMS weeks were being run continually, without the chance of such breaks, then that might lead to stress or tiredness:

“a lot of our team have got days off and working from home and things like that, because it is exhausting and we are very aware of that. So we are going to have to work it out. I don’t know how we are going to work it out, .. because it’s going to be very difficult with the amount of staff we have got and how to do it” (Staff FG2).

Some staff in the support team highlighted the need for clearer channels of communication for students in terms of who they should be contacting with queries about attendance at SIMS week.

5.20.4 Training needs of staff

Staff were asked about what training they felt they needed or had had in relation to the SIMS week. One member of staff said:

“We have never done a project like this ever, any of us, without saying it was the blind leading the blind, to a certain extent it was. We had a situation where we had a project lead that then unfortunately left, so we had to pick up the pieces and that wasn’t particularly easy” (staff FG 2)

The relatively high cost of some simulation training was also noted by staff in the focus groups:

“Actual simulation training is a very different kettle of fish. There’s a couple of courses, {name of lecturer} has found quite a reasonable one at GOSH and there are some very, very expensive ones which would be completely out of all our budgets, which are more similar to the sort of thing that {name of lecturer} is doing on her PG Cert” (staff FG 2)

However the department did have considerable funds available for training (from the HEE SIMS project grant) and staff had been sent on training in relation to designing and delivering debriefing sessions with students (a key part of the simulation process) and on some more basic technical skills such as moulage (applying make-up which simulates wounds for example) but they had found it difficult to find providers of such training.

“But I think you know it’s new, it’s new what we’re doing, so it was a case of suck it and see to a certain extent, which everybody has done remarkably well.” (staff FG 2)

One member of staff with previous experience with simulation felt that they had grown considerably during the SIMS pilot, particularly in terms of leadership skills and in understanding learning outcomes. The experience of taking part in SIMS pilot had acted as a form of training. Another member of the team was studying for a PG Cert in simulation in clinical education which they were finding very useful and this knowledge was being used to feed into scenario designs which the team were producing. Several members of the team had been on the General Instructor Course (GIC) which provides some training in how to run a simulation and some experience in debriefing.

“So I definitely think that GIC course is something for advanced life support, but you can actually use it in the simulation setting, it’s transferable. I was just going to say that.”

“But someone has got to be clinically experienced enough initially to go on an advanced life support course, all our team would be, but a lot of people wouldn’t be. Then you have to be selected to be instructor potential for that course, so you’ve got to be the top level of that course and then you go off and do the GIC.”

In summary, it seemed that there was some unmet need for training amongst staff and some forms of training were hard to source and/or expensive. However despite that, staff had an impressive range of training, skills and qualifications which equipped them to deliver the SIMS weeks.

5.20.5 Reflective learning

It seemed that staff were informed by a constructivist approach to learning and referred to concepts such as zone of proximal development¹², peer learning, scaffolding and reflective learning throughout the two focus groups. The quote below makes the important point that simulation (and the SIMS week specifically) may have higher value for first-year students (who were the subject of this evaluation) than for students in other years who may already have had more opportunities for reflective learning. This is not to say that other years do not benefit but rather than the benefit may be greater for first year students.

‘Simulation ... it’s not just the .. what, it’s more the why, how could that be improved, how did you feel about it and I think for a first year, they probably benefitted more than others, because it’s the first time they had that type of exposure to reflective learning in practice and on practice, in the same scenarios. (staff FG2).

¹² The zone of proximal development and scaffolding are key concepts in Vygotsky’s work (Bockarie 2002; Sanders et al, 2005)

One of the main spaces in which reflective learning could happen during simulation is the debriefing session held at the end of each day, which all staff viewed as key to the success of simulation. One member of staff said in relation to the debriefing sessions.

“I did I feel that they were quite reflective ... I think the whole thing about debriefing is it's about helping, you put out a question there and you get the students to think, give them the space to think and reflect and it's not for us to be, keep firing them with questions, it's for them to answer, debate, and for them to get the talking going and we sit back and facilitate it... Then just let it flow and then when it feels like it's come to a natural end, what I used to do was just say, okay so this is what we found, if it was something like anaphylaxis make sure everybody is on the page of how to treat somebody with anaphylaxis and then just find out what learning they would take to practice from what's come out of the experience” (staff FG2)

Another member of staff highlighted that the debriefing sessions had allowed students the opportunity to compare and reflect on their placement experiences which had not always been positive:

“a lot of what was coming out in the debrief was about their own experiences in placements and kind of comparing it [with SIMS] and sometimes because they've had very negative experiences [in placements], they value the simulation a lot. Yeah that's, so it was more about them, how you know it was quite supportive between them, like reflecting on their own experiences and their own kind of practice assessors and the pressure of, at least they feel more at ease in the simulation” (staff FG 2)

5.20.6 Diverse pedagogical approaches

It seemed that staff were generally informed by a constructivist approach although they referred to other learning concepts as shown in the two extracts below which refer to scaffolding:

“I think we are just in a more constructivist theory, because what we want to do mainly is to bring back all that, the prior learning that they have done in a very separated way and we want them to build upon that. So we use summaries now, we question them to bring that knowledge back, rather than just teaching them. And we also build up upon every year we use these kind of like very similar themes, but we make it way more complex, which is also part of the goal. (staff FG1)

“There's just maybe one extra thing that I would say to add on to what you've just said, is that the whole idea behind the lesson plans, which is done quite nicely in the HEE project, is that it was supposed to be an hour theory, then moving onto an hour practice of the skill and then it was into an hour of simulation” (staff FG1)

Although most staff stressed the importance of reflection they did not particularly see the need for a single, unified or clearly defined pedagogical approach:

‘‘I’m afraid to say that when they {lesson plans} were written I don’t think that there was a great amount of thought about the pedagogy behind the lesson plan I would suggest they were written according to what we thought the students needed and if there’s a theory for that, then that’s great, but I don’t know it’’ (staff FG1)

‘‘we have used many different, it’s a multi different pedagogy theory, so we have .. things like reflective, like it’s not just one type of pedagogy theory, we’ll have some reflective, multi different theories in one throughout the simulation, because it is the constructiveness one, but it’s also reflective...we are using lots of different approaches, but it probably wasn’t explicitly said in the format of the structure of how we wrote it, but a lot of the theories would fit into what we’ve delivered’’. (Staff FG 2)

The absence of an explicit pedagogical approach is not necessarily a problem - most of the staff were highly trained and experienced and their intuition about what is appropriate or not is likely to be very valid. Staff had feedback from students in the debriefing sessions to draw on, as well as students’ participation and responses during small group teaching in judging the effectiveness of their approach, as well as internal evaluation surveys. However, it is perhaps something for staff to reflect on, in terms of whether they think there is something to be gained from having a more explicit and coherent pedagogical approach underlying the design of scenarios or activities in relation to simulation (Horsfall et al., 2012; Pagnucci et al., 2015).

5.20.7 The value of teaching in small groups

The value of being able to teach students in small groups (with low ratios of staff to students which would not normally be possible in either practice or the university setting) was noted by several staff.

‘‘it was, from my point of view it was enjoyable teaching two or three students again. We were able to do that proper nursing, do you understand what’s going on, how does that link to the blood pressure, how does that link to the medication we are planning to give next. I think you are right, I think academia has taken nursing to a destination which we are now professional, we’ve got a degree, masters programme, that’s great, but what we seem to have lost is that bedside tutor, who is there supporting you, understanding diabetes through and through, with a real life patient in front of you. (staff FG 2)

The focus group moderator (a nurse teacher) noted that teaching in small groups in the scenarios reminded her of clinical teaching, which used to be part of NHS training of nurses but is no longer part of placement learning although students would have one to one times with their practice assessor. The moderator, who is now an experienced senior nurse and academic offered her view that:

“what we seem to be seeing is the introduction, or going back to a more traditional view of practice learning, which was that you do need to learn in small groups and you do need plenty of experts supervising and mentoring juniors.”
(moderator in staff FG 2)

And staff agreed that this was the case:

“That was my aspiration in life and then they changed it and I ended up not being able to be one and for me I feel like I’ve come back and I’m doing it again and it’s quite nice, because it’s exactly right. I think in the skills team, because a lot of our, all of our and ... we all teach in much smaller groups. So I think we’re used to, we are doing a lot more of that now and I completely agree with you it’s very beneficial to the students” (staff FG 2)

The low staff to student ratio in simulation means that it is resource intensive and therefore expensive; it can only be offered in fairly limited amounts (staff envisage the offer as being one week in each of the three years of the pre-registration nursing programme, from September 2023).

5.20.8 Safe learning environment

The SIMS week was often referred to by staff as a safe learning environment where students could learn and reflect and make mistakes, without any consequences for the patients or themselves. Students can participate in scenarios which they might rarely encounter in practice and in theory repeat them as many times as needed, taking into account their learning and reflection, to improve so that when they encounter difficult or challenging situations in placements they do not ‘freeze’ but rather their training and learning kicks in. The provision of a safe learning environment was considered one of the key benefits of the SIMS week and is discussed in more detail under the ‘outcomes and benefits’ themes.

5.20.9 Challenges to the NHS as a learning environment

There was a belief among staff that there had been a deterioration in the NHS learning environment. The staffing crises and the extra pressure from the backlog of treatments (exacerbated though not created by covid (Allan & Evans, 2022), and gaps in the education of nurses due to covid, meant that there were simply fewer staff/few staff hours available to support the learning of students on placement and a greater likelihood that the supernumerary status of the student would not be respected (i.e. they are treated as an extra pair of hands rather than someone who is primarily there to learn). This is borne out in the literature (Jack et al., 2018; Williamson et al., 2020; The Kings Fund, 2021).

“So initially we just wanted to, I suppose, release student hours from practice, so we know there’s pressure on the NHS, we know that we struggle to get placements sometimes, or placements that give students enough experiences to meet the requirements of the programme, in terms of skills”. (staff FG 1)

“when we were doing the debriefs with the students, they was, everything that we’re talking about in here, they would just mention it to us. They were telling us horrible stories, which is really, really sad, of how their practice has gone. They are not supported by the nurses that are in practice, because those nurses that are in practice are short staffed and they are so stressed themselves. Some of these nurses they are just newly qualified nurses that are supporting a student, while running a ward under staffed and being the nurse in charge. They’re saying horrible, horrible stories, they are seeing many people that have been qualified one year more than them, leaving nursing”. (staff FG 1)

“we all know the constraints on practice, time, pressure etc... some of the practice assessors are very junior, extremely junior, as in they were still covid generation students here. So the time and expertise that we have in the skills centre, including those who’ve come into help, is what they don’t have” (Staff FG 2)

Quite apart from these issues is the trend for increasingly short patient treatment times and much reduced time in hospital as an inpatient and the consequent reduction in learning opportunities for the student and fewer chances to build up experience of caring for a patient over time:

“one of the biggest problems that we’ve got now with our placements is that ten years ago if you came in to have your gall bladder out, you spent three or four days in hospital, now you spend a day, or overnight or something. ... so consequently the students are not getting the opportunity and practice to actually get their skills signed off” (staff FG 1)

5.21 Outcomes of the project

The fact that SIMS week provides a safe learning environment for students has already been discussed under the ‘pedagogy’ theme but it is worth mentioning here as it was seen as one of the main benefits of the SIMS week. As touched on earlier, some staff identified that the SIMS week had led to greater integration of theory and practice by students. A considerable number of other benefits were also identified and chief amongst these was increased student confidence.

5.21.1 Increased student confidence

The benefits most frequently identified by staff was increased student confidence and particularly in relation to increased confidence about placements. Staff noted that in the debriefing sessions in SIMS week, students had described very poor experiences in placements, where they often felt unprepared and unsupported, and that students felt SIMS week had helped increased their preparedness and confidence a great deal:

“. They need to feel prepared and they need more that independent feeling, so what we’re doing with the practice in the ward for example, is giving them the resources that they would have in the ward and allow them time, to be able to access those resources as well” (Staff FG 1)

‘‘So yeah I think simulation would be really good in giving students confidence. My main point is it’s not about making them a better nurse as such, but nursing retention is really terrible, nurses are leaving and part of that is down to their confidence. If we can raise their confidence up by doing the simulations really well, hopefully we will start to see nurses not leave as often’’. (Staff FG 1)

‘...it was the environment felt safe, they could do things that they wouldn’t do in practice and especially like when we did ESPA, quite a few of them were saying, I’m ready to go into practice and ask my practice supervisor if I can give an ESPA handover, because they practiced it so many times and they made whatever hiccups they had to, they learnt from it. So I think it’s just having that space to make mistakes and learn how they can learn from it. That’s what I think’’. (Staff FG 2)

The students in the evaluation were all Year 1 students so SIMS may have had a stronger effect on their confidence than students in years 2 or 3 who had had more placement experience.

5.21.2 Theory and practice

Staff felt that simulation had helped students to link theory and practice, although there was perhaps some ambiguity what those terms meant exactly. It was sometimes seen as meaning the internalisation of skills or training perhaps, the ‘penny dropping’ and understanding the ‘why’ rather than just the ‘how’ in relation to clinical skills, or decision making, or ‘seeing the bigger picture’. The interviewer asked staff if they could identify examples of when they had seen a student linking theory and practice:

Staff: I think there are times when you can see, it’s like the penny drops. So you’ve got some students where you can see they get that ‘aha’ moment, but also it can be difficult because it’s not unless, when you do the debriefing which I got quite a bit from the students, they say and they articulate it, saying I’ve been in class, I’ve had all the theory, but it didn’t make sense until I’ve now done this. And they can see how it merges and works together, does that make sense? (staff FG 2)

Staff: ‘And I think with communication as well... there’s reflection as well, the way in which they reflected, particularly actually when we used the actors, in the feedback the actors were able to give to them, I think encouraged more reflection from the students, which we obviously can’t get when it’s a manikin, because manikins can’t talk to us. So I thought that was, I saw a lot of learning taking, I thought it linked theory to practice in that way as well’ (staff FG 2)

Staff: I’ve seen, especially how we divide things and watching the last two pilots go through, you can actually see the students making sense of what they’re doing and bringing it together and breaking that theory learning gap’.. (staff FG 1)

There was awareness that students might perceive a theory/practice 'gap' in that they had not had many changes to put learning into practice and they perceived that the SIMS week had given them an opportunity to 'bridge' the theory practice 'gap':

“however many times we talk about the theory, however much times we let them practice, until they actually get into that simulation ward and they are, they are slightly under pressure, they don't feel that they are doing it as a real nurse and that is what they are saying. So one can call it a gap, or you can call it a transition, or call it whatever you like. But they are learning a skill, you teach a skill in the classroom until you get them into that simulation ward, it's not real to them and that's what they are saying”. (Staff FG 2)

“ the whole idea behind the lesson plans, which is done quite nicely in the HEE project, is that it was supposed to be an hour theory, then moving onto an hour practice of the skill and then it was into an hour of simulation. So it's kind of scaffolding itself in the session, but it's like that, we were trying to link theory to practice, because before there was a lot of, this is the theory and then they would come and say this would be the practice. But there wasn't sometimes as much linkage, where it's very much all integrated into one session now and that's why the HEE project I think for the current first years, it's going to be really great to see the difference between the lesson plans that we've just introduced and how different they are in this simulation project, versus the third years, who unfortunately didn't have this teaching style before. So I think you're going to see a really big difference in the participation, the knowledge, the like hands on practical skills, it's going to be really different I think for the first years. ” (Staff FG 2)

There was a perception from at least one member of staff was that the two online days when students were engaged in simulation activities online, usually from their home, were 'theory days' and there was perhaps some ambiguity about whether the online days were actually simulation, although most staff felt that they were. Staff perceived that the online days were much less popular with students than the ward simulation days in person, at the StoneX campus.

5.21.3 Reduced attrition from the programme and from the NHS workforce

Some staff mentioned that they thought that the increased confidence of students might reduce attrition on the programme and possible also lead to greater retention in the NHS workforce, post-registration.

“So yeah I think simulation would be really good in giving students confidence. My main point is it's not about making them a better nurse as such, but nursing retention is really terrible, nurses are leaving and part of that is down to their confidence. If we can raise their confidence up by doing the simulations really well, hopefully we will start to see nurses not leave as often” (staff FG1)

5.21.4 Simulation makes the programme more attractive to students/increases demand

Some staff felt that simulation makes the Middlesex nursing programme more attractive to potential students and also to staff which should be a benefit in terms of the numbers of students applying to the

programme, student retention and attracting and retaining the best staff also. One member of staff noted that one of their main reason for applying for their post at Middlesex was the University's investment in, and commitment to, simulation in nurse education.

5.21.5 Produce better nurses for NHS workforce

It was noted by one member of staff that the SIMS week might ultimately produce better nurses for the NHS workforce, in that they will be more experienced and therefore have less reason to be worried about making mistakes which might lead to litigation.

‘I mean I’m going to be very old fashioned here, there are a few old fashioned nurses here who have been around for a long time, I believe that it will make for better nurses, because they will have more opportunity to practice. I think {students} are scared when they go onto the wards, because they don’t feel properly prepared and we live in a very litigious society where everyone is looking over their shoulder, to make sure someone isn’t going to sue them, or they’ll be up in front of the NMC, or they’ll be up in front of the Coroner’s Court, we’ve got that ingrained in our mind and I think what we’re doing here is giving the students, going back to the old days, when we had plenty of time to practice. There was plenty of opportunities for us to do these things, because our patients were in hospital for longer, there weren’t so many pressures etc., etc., I think it’s going to make for a better nurse’. (Staff FG1)

5.21.6 Interprofessional learning (staff and students)

Staff noted that opportunities which they had during SIMS week to interact more closely with colleagues from other nursing specialisms and they felt this had been very beneficial and enjoyable. There was some discussion about whether the scenarios were equally appropriate for all specialisms and it was felt that perhaps they were more geared to adult than MH or CYP, although scenarios were applicable to all specialisms to a great extent.

5.22 Integration of SIMS into the pre-reg programme

Staff were quite clear that the main driver for the HEE SIMS project was to work towards having some substitution of placement hours with simulation. The curriculum already allows for a small amount of this but Middlesex has applied to the NMC for permission to substitute up to 600 hours of placement time with simulation (i.e. about 25% of the total 2,400 placement hours).

SIMS week confirmed to staff that the student demand for SIMS (and especially the ward or community-based scenarios, on campus at StoneX) was very strong and staff felt that students were benefitting greatly from it, especially in terms of students’ improved skills and confidence.

Staff felt that they were ready to ‘roll out’ SIMS for the nursing programmes starting in September 2023 (i.e. to make it part of the standard offer) but it was envisaged that it would be restricted to one week for each

year of the programmes. The barriers to the further roll out of SIMS into preregistration programmes are discussed below.

5.22.1 Barriers to integration of SIMS into nursing programmes

Some of the barriers to the integration or expansion of SIMS into the nursing programme were that it is staff intensive and therefore expensive in terms of staff training and staff time. One member of staff noted that the low staff to student ratios which they were able to provide during SIMS week would not be available in the future and therefore SIMS would have to be delivered with fewer staff per student and this could increase pressure and stress for staff.

‘‘I just wanted to say that because, but I think as far as, because I’m resourcing it, it is going to be very difficult financially to resource it in the way that we had. We had a lot of staff there, there was far too many staff there, but we wanted the students to have that great experience. I think going forward we will have to find ways of doing it with decreased numbers of staff and that I think may add to the stress. I don’t think we were stressed last week, because it was lovely and we had lots of staff. I don’t know going forward how easy that is going to be.’’ (Staff FG 2)

SIMS is also expensive in terms of the recruitment and hire of actors for scenarios. The cost of building the SIMS lab and maintaining it is also presumably considerable.

The application to the NMC for substituting an additional 600 hours of placement time with simulation is ongoing and it seemed that there was some lack of clarity from the NMC about their requirements (e.g. the exact extent to which actors and service users must be involved in the scenarios). The scenarios developed for SIMS week will form part of the application to NMC.

The tariff provided by HEE for the training was considered by staff to be below – (£130 per student per week) compared to what placement providers would be paid for the equivalent amount of placement time).

‘‘So that’s what we get from our students, so if we brought our students in for a week, we will get £100 per student¹³, which is, I’m not saying that’s nothing,, but if you compare that with how many lecturers we are going to need to put on the simulations we are putting on, it’s going to be quite difficult. And that’s, it’s above my pay grade to make that decision, .. but that will be a contributing factor. As far as can we do it in September, yes we can, we could do it for tomorrow if we needed to, but there’s many barriers to stop that happening’’. (Staff FG2)

Staff were aware that scenarios with actors were the most realistic and offered the best opportunities for reflective learning especially as the actors can participate in the debriefing sessions and give feedback to

¹³ It was later confirmed that the tariff is actually £130 per week per student

the students on how they (the actors) experienced the care delivery. Actor-based scenarios were also the most expensive type of scenario to provide and probably also required the most preparation in terms of sourcing and briefing the actors. Therefore the SIMS “offer” would have to include some ‘lower fidelity’ simulation including online activities based on platforms such as padlet.

“In the ideal world, no, in the ideal world we’d have them {actors} in the whole time and I think actually that’s probably what the students would say, but then the realism is we can’t do that and we actually can’t afford to do that anyway. So you know, it’s, the online is undoubtedly a different experience. It can’t be the same, however much we try and say it’s simulation, it’s just, it’s not, it’s a different experience. That doesn’t mean to say it’s a bad experience, it’s just a different experience” (Staff FG 2) .

Although staff identified a range of barriers they still thought that they would be in a position to ‘roll out’ SIMS from September 2023 and the expectation was that they would provide one week of SIMS per year of the programme (i.e. a student on a three year programme would experience three weeks of SIMS) , as mentioned above. One member of staff said that provision of SIMS had already been written into the programme for next year (i.e. starting September 2023) and although it was not yet clear exactly how or when the SIMS would be provided the plan was becoming clearer:

“So that one has three days, plus two days online. So from a logistics point of view, it means we will be delivering 90 days of simulated learning and each of those days will be three wards running at, three wards delivering to about 45 students, with a total of six staff” (staff FG1)

It was clear that most staff viewed SIMS as something that would increasingly become part of the pre-registration programme and they believed that it was as effective as placements and indeed offered some advantages over placements (e.g. provides a safe learning environment, students can practice unusual or rare scenarios, there is no risk of harm to patients, there are greater opportunities for reflective learning and inter-specialism learning and being able to compensate for weaknesses or gaps that may occur in the NHS learning environment).

“Well the barriers are basically being able to provide the service financially, that’s the main one I would say, is having enough staff to be able to run what we need to do. And also we have to make sure that we, if we’ve got adequate placements in the clinical area, we are not saying we are better than the clinical area, we are just saying that we are providing an alternative if we can’t get placements” (staff FG1)

Many staff felt excited about rolling out SIMS and were proud of what they had achieved in developing SIMS.

5.23 Lessons learned (staff)

Staff identified a number of things which they considered as “lessons learned”.

The scheduling of SIMS week should be more sensitive to coursework deadlines (the first-year students had a coursework deadline very close to the end of the SIMS week).

The first day of a SIMS week should be face to face, to allow students and staff to get to know each other and build up a rapport (the first day was online in the SIMS week which we evaluated making it a little difficult for students to establish rapport with each other and staff and this was something of a barrier to interaction in online activities).

Staff felt that the balance of online days and on campus days was about right (two of the former, three of the latter) and although some staff thought that students would prefer five days on campus they felt that this was unaffordable in terms of staff time and resources.

Some staff identified that there was a need for improved consultation and communication with students about which students should attend and being clearer that the SIMS week was compulsory for those students who were chosen.

Many staff recognised the value of inter specialism learning/teaching in SIMS week and it follows that SIMS week should continue to facilitate this sort of learning by bringing together students from different specialisms. In the quote below, a member of staff recognise the value of inter-specialism learning during the online days (which interestingly are referred to as ‘theory days’).

‘It was great to see, no matter what branch the student was in, they were sharing knowledge and experience from their own field, which for me was good. I think we’ve lost that, well we talk about the traditional nursing when it was an SEN, we’ve lost that, then we had the Project 2000, when we still had it for 18 months, we’ve now gone to this. You start as a MH nurse, you don’t generally interact with anyone outside of your,branch, ...I think that was good to get them back into together again, to get them to say nursing is actually nursing. .. I always joke around that small people are just big people but smaller, but it’s not, the essence of nursing is very different and it will be nice to know what a paediatric nurse does from a mental health point of view and I think students selling it to students, is better than me trying to tell someone else what I did. So for me that really did work those two theory days’’. (staff FG 2)

5.24 Synthesis of quantitative and qualitative findings

In this section, having presented a great deal of evidence from a range of quantitative and qualitative methods, we bring together a summary of the key findings for each stakeholder group (staff and students) according to the method of data collection.

Method	Key themes/findings
Student Survey	Half of respondents were aged 45-55 (mature) and around 57% were female. 57% of respondents were mental health students, 28.6% adult nursing students and 14.3% were children and young people nurses. Accessing SIMS from home: Lack of access to devices or competing with other members of the household for devices was something of a barrier/significant barrier for 25% of respondents, However, most students did not experience significant barriers to participation in SIMS from home although just over a quarter did consider not having a quiet/comfortable environment at home was something of a barrier/significant barrier and just under 17% felt that issues with broadband/internet were something of a barrier/significant barrier. The same proportion through that their lack of/poor IT skills or lack of confidence in its skills were something of a barrier/significant barrier. Participating in SIMS on campus (StoneX) The perceived barriers to participation were fewer in relation to participation on campus (StoneX) as compared to remote participation; less than 10% of students experienced any barriers to participation with related to the items mentioned in the questionnaire (N.B. transport and conflict with written work deadlines were issues which emerged in focus groups/debriefings but which were not asked about in the questionnaire)

Method	Key themes/findings
	Satisfaction with the SIMS week was extremely high. Nearly all respondents were fairly or extremely satisfied on all aspects of SIMS week but satisfaction with the remote/online activities was a little lower. The proportion who were ‘extremely satisfied’ was highest in relation to support from staff and the overall experience (83.3% in each case) and lowest with regard to realism of scenarios (without actors). Student confidence increased from pre to post, SIMS week on nearly all aspects which were asked about (e.g. 26.7% increase on ‘your overall confidence as a student nurse’, from 73.3% to 100% being fairly or extremely confident). This is consistent with what students said they had wanted to get from SIMS week (increased confidence, especially in practice and increased skills). The realism and duration of scenarios was rated highly.(i.e. seen as being of appropriate length)
Student focus groups	The main themes which emerged from the student focus groups were: • Barriers to participation in SIMS week (issues for students included accessibility of the StoneX campus, cost of travel and the fact that SIMS week was occurring very close to a coursework deadline). • Attitudes to online activities (most students valued these but some did not see their relevance / value and there were issues for a few with being distracted at home or by other tasks, issues with internet or device access, and some felt that the instructions for online activities should be clearer and that there was a lack of engagement of students in the online activities). • Realism of the scenarios (It was clear that most students felt that the scenarios had a high degree of realism, but much more so in relation to actor-based scenarios). Scenarios were seen as having some advantages over placements (practice rare scenarios, safe learning environment. More teaching support/low staff to student ratio. More reflection/feedback)

Method	Key themes/findings
	• Skills or procedures (students described acquiring or improving skills such as basic measurements, blood pressure, canula withdrawal, handover, injection technique, observations, refreshing skills, sliding sheets, urine test, vital signs. More generally, escalation was an aspect of some scenarios helping students to know when to refer to more senior staff for advice or support) • Change perceived by students, over the week • Confidence increased (there were many references to increase confidence across a range of skill and generally increase in confidence) • Confidence in placements (there were many references to feeling confident / ready/ excited to go into placement). (students had had mixed experiences on placement, with a fair amount of negative experiences reported – feeling unsupported or unprepared) • SIMS week was generally experienced as an intense and perhaps exhausting experience but also very rewarding – the balance of on campus and remote working is important and (possibly) one day off needed in the week
Staff focus groups	Aims and objectives of the SIMS project Staff were clear that the university's main immediate motivation for making this application and developing the scenarios was to replace some placement hours with simulation. This replacement is needed for variety of reasons including the difficulty of getting placements and the deteriorating quality of the NHS learning environment. Importance of realism Staff were also very aware of a hierarchy of realism in that scenarios involving actors were more realistic than those just involving manikins even if both were of value and it was noted that the scenarios with actors were more conducive to reflection as the actors could give detailed feedback about how they felt as the patient.) Pressure on staff Organising the SIMS weeks involved a great deal of work for staff, especially the clinical skills team. This was in terms of deciding the details of the scenarios and mapping learning outcomes onto them and physical aspects of organising installing

Method	Key themes/findings
	and managing the equipment and actors at StoneX and managing the students' participation. It was noted that when SIMS week was being run regularly (from September 2023) the pressure would probably be greater as the staff to student ratio would be higher (i.e. fewer staff per student) and there would be fewer opportunities for recuperation between delivering SIMS week). Training needs of staff Some staff had no previous experience of SIMS, most had had some had had training but in any case felt themselves to be on a very steep learning curve. Training for SIMS can be expensive and not always easy to source) Pedagogy (staff did not have an explicit or single pedagogical approach but aligned themselves to constructivist approaches and placed great value on reflective learning and briefing sessions and teaching in small groups) Safe learning environment - SIMS as a safe learning environment in which students could feel free to make mistakes, without consequences, was repeatedly stressed by staff NHS as a learning environment – staff were aware of weaknesses/ gaps in the NHS learning environment due to staff shortages and faster 'turnaround' of patients amongst other things Outcomes of the project – Staff perceived that SIMS week had: • Greatly increased student confidence and helped them link theory and practice • Increased clinical skills (especially handover, injections, escalation etc) • Improved decision-making • Potentially improved student retention and possibly also improving staff retention, post-registration • Potentially creating safer nurses

Method	Key themes/findings
	• Makes programme more attractive to potential students • Improves interprofessional study/learning Some barriers to roll out of SIMS were identified (cost of training, staff time and presumably equipment and maintenance, cost of actors, electricity and other running costs at StoneX and low tariffs from HEE) Further expansion of SIMS is seen as inevitable and 'the way to go' already used much more widely in other countries
Student focus groups	• Barriers to participation in SIMS week (issues for students included accessibility of the Stone X campus, cost of travel and the fact that SIMS week was occurring very close to a coursework deadline), • Attitudes to online activities : (most students valued these but some did not see their relevance / value and there were issues for a few with being distracted at home or by other tasks, issues with internet or device access, and some felt that the instructions for online activities should be clearer and that there was a lack of engagement of students in the online activities) • Realism of the scenarios (It was clear that most students felt that the scenarios had a high degree of realism, but much more so in relation to actor-based scenarios). Scenarios were seen as having some advantages over placements (students can practice rare scenarios, there is a safe learning environment and there is more teaching support/low staff to student ratio, and greater opportunity for reflection/feedback) • Skills or procedures (students described acquiring or improving skills such as basic measurements, blood pressure, canula withdrawal, ECG, handover, injection techniques, observations, refreshing skills, sliding sheets, urine test, vital signs. More generally, escalation was an aspect of some scenarios helping students to know when to refer to more senior staff for advice or support) • Change over the week:

Method	Key themes/findings
	• Confidence increased (there were many references to increase confidence across a range of skill and generally increase in confidence) • Confidence in placements (there were many references to feeling confident / ready/ excited to go into placement). (students had had mixed experiences on placement, with a fair amount of negative experiences reported – feeling unsupported or unprepared) • SIMS week was generally experienced as an intense and perhaps exhausting experience but very rewarding – the balance of on campus and remote working is important and (possibly) one day off needed on the week
Observation (staff and students)	Using a range of simulated scenarios, students could immerse themselves into a situation where they can explore their feelings, absorb knowledge and practice skills they may encounter within clinical practice. The blend of online and face-to-face learning over the week of the pilot appeared to the observer to lend itself to integrating learning and lecturers continually reinforced the learning themes from day one across the online and face-to-face learning modes. A constant refrain from the lecturers was that simulated learning allowed students <i>‘to make mistakes and learn from them’</i> The importance of emotions in learning was evident. The simulations, both online and face-to-face, experienced over the week evoked emotional reactions from the students which were observed and recorded by the observer. Debriefing explicitly allows lecturers to focus on feelings experienced in learning (and thereby integrate learning) and encourages students to process their emotions from the experience.

Method	Key themes/findings
	These debriefing sessions themselves drew on prior learning about reflective practice elsewhere in the curriculum and students were adept at reflecting on their learning. Lecturers appeared skilled facilitators of learning through emotions. The debrief following the scenario allowed the recontextualisation of theory to practice Peer learning in both online and face-to-face simulated scenarios was observed by the researchers although it was weaker in some of the online scenarios. Students processed information together, problem solved in pairs or small groups, came to shared decisions, led their peers where there was uncertainty in both technical and non-technical skills. Students drew on existing knowledge and understanding by working through scenarios within timed frameworks supervised safely by skilled expert teachers. The manikins and actors appeared to increase the fidelity of the simulation. There was some evidence of digital inequity in terms of IT skills, access to devices or adequate internet access but it was not a significant problem for most students.
Debriefing sessions	Realism of the scenarios (the students were clear that the realism was greatly enhanced when actors were in the scenarios as opposed to manikins, although both offered degrees of realism) What students will take into practice (confidence, especially in relation to handovers, better organisational skills), improved communication skills.

5.25 Discussion

Many of the key findings from this evaluation are consistent with the literature in terms of student enjoyment, satisfaction and increased confidence in relation to SIMS and staff confidence in its effectiveness. The fact that students considered the scenarios to be realistic and that they engaged with them on an emotional level is also consistent with existing literature as is the fact that students preferred the higher fidelity simulations (especially those involving actors). The importance of the debriefing sessions and the importance of staff training and experience in debriefing also chimes with the literature. We also found some evidence of barriers to participation such as digital inequity (although this was not a problem for the majority of students in SIMS week) which is also found in the literature. However it is important to note that there are major gaps and weaknesses in the literature (i.e. low quality studies) with regard to SIMS so that there are still many important aspects of SIMS which have not been rigorously researched. While the overall picture regarding SIMS seems very positive it is important to bear these limitations of the literature in mind when evaluating SIMS projects.

5.25.1.1 Limitations of Research and evaluation designs or methodology

Some systematic reviews or more general reviews of literature find that there is a lack of rigorous evaluation of SBE, with few designs that use 'objective' measures of outcomes (e.g. experts assessing the skills or outcomes against agreed criteria through observation). Self-assessment by students or the views of staff administering the SBE are more commonly used in evaluations and such measures are prone to bias. There are also relatively few studies which use strong research designs such as experiment or quasi-experiment (where there would be a group of students participating in the SBE and a control group who do not and differences are tested for statistical significance). It is common for evaluations to use unvalidated or unstandardised measurement scales in questionnaires or other data collection instruments (Cant and Cooper 2017).

Equally (as Cant and Cooper 2017, Stayt 2012 and Johnston et al. 2018 point out) there are few studies which seek to examine the long term impact of SBE in pre-registration education e.g. through following students into practice or placement attempting and to assess how SBE many have interacted with the longer term development of student nurses in terms of clinical skills, confidence decision-making or other measures. There are some studies which do look at long term impact which Cant and Cooper described in their review and these "add rich data to what is known about transfer of knowledge into practice" but this sort of longitudinal approach in the evaluation of SBE is rare.

"Gordon et al. (2013) tested the impact of simulation education using high-fidelity simulation with a manikin on students' blood pressure measurement accuracy. In addition to pre- and post-simulation measurements, observed accuracy was tested after a further 40 h of clinical placement experience, thus acknowledging a contribution made by

practice experience. A randomized trial teaching nursing students cardiac arrhythmias tested knowledge at baseline, after the intervention, and after a further three months, showing that the simulation group had significantly greater knowledge and better retained knowledge (Tubaishat and Tawalbeh, 2014). Further, Hart et al. (2014), studied educational gains in a 45hr structured course curriculum at pre-test, midway through the course, and as a post-test''

The fact that the evidence base on SBE is so varied in terms of the 'dose' or amount of SBE that is used in the interventions may be a confounding factor in understanding the effectiveness (Cant and Cooper 2017). For example, SBE may be effective in developing (for example) critical thinking skills but only where the SBE is over a certain period of time e.g. one day, three days, a week or two weeks. Many of the SBE interventions reported in the literature are relatively short and are 'one-off' sessions and this may be an insufficient basis on which to judge the effectiveness of the SBE intervention. The SIMS week evaluation being carried out over a week was more substantial than many published studies but a week is still too short a period to judge sustained impact or outcomes.

Stayt (2012) and Rourke (2020) argue that It is difficult for educators to make decision about the use of SIMS on a cost benefit basis as there is insufficient evidence to allow educators to do that in terms of being able to say "this level of fidelity will lead to this learning outcome to a great extent than another level of fidelity". Stayt says:

"Clinical simulation, in part through necessity, has been widely accepted into nurse education curricula and, at face value, offers many advantages; to that end it has already become an essential component of nurse education. However, we have seen that to effectively facilitate learning of the different patterns of knowing using different learning approaches is not an easy task. This is however, not to say that effective learning does not occur, rather that the extent to which learning occurs and the efficiency with which this learning is transferred into clinical practice remain unquantified. Hence, the cost benefits of clinical simulation may not be accurately evaluated at this time. This may be a case of innovation preceding evaluation and that, given sufficient research its worth will be reliably demonstrated. Alternatively, the current absence of probative data may be an indication of the limitations of clinical simulation."

Although this statement was made more than a decade ago, and there is some literature on cost-benefit analysis in relation to equipment fidelity level (e.g. Hippe et al. 2020; Maloney and Haines 2016; Lapkin and Levett-Jones 2011), it would seem that there is still not a clear basis on which to make cost benefit assessments of using SBE compared to alternatives or to compare the benefits of different levels of fidelity within SBE on a systematic basis.

5.25.1.2 Difficulty in making evidence-based decisions about the use of SIMS and training needs of staff

Haerling (2018) argues for the need to make evidence-based decisions which also factor in the cost of different technologies or levels of fidelity as higher fidelity may not always mean better learning outcomes, as also referred to earlier in Yuan's 2012 systematic review. Stayt (2012) cites evidence that decisions about purchasing SIMS equipment may be technology led rather than pedagogically led. Citing other authors in her review, she says that:

‘Harder (2010) and Shinn (2006) suggest that the purchase of high fidelity technology often precedes the development of a sound educational programme. Indeed, Kneebone (2005, p549) poses the critical question: ‘Does the ingenuity, surface realism and technological wizardry of simulation eclipse the key issues in learning and teaching?’’

Although it has been more than a decade since Stayt's paper, and the novelty of simulation equipment may be much less now, than it was then, it still seems valid to reflect on the process by which simulation equipment is chosen and purchased and to what extent this is pedagogically led. Wyatt (2023) in a US study, points to the rapid expansion of SBE which was accelerated further by the covid pandemic. She argues that this can create a situation where simulation equipment appears in nurse education departments and nurse educators are forced to respond reactively to design teaching around this but often without adequate training and without a deep consideration of pedagogical principles or theory. It is not suggested that this was the case with SIMS week but the research underlines the importance of a rational approach to acquiring simulation equipment and equally the importance of simulation being pedagogically driven and providing appropriate support to staff to enable that approach.

5.25.1.3 Diversity in simulation

Lamberson et al. (2021) highlight that racism may be hidden in the curriculum, including simulation settings, due to unchallenged assumptions of 'Whiteness' as the standard reference point. Foronda et al (2020, 2017) and Foronda and Graham (2017) recommend increasing racial diversity in simulation products and scenarios to foster inclusion and optimize learning. Graham & Atz (2015) recommend diversifying simulation experiences and (Graham et al., 2016, p. 136) highlight the importance of acknowledging the "exclusive Eurocentric culture of nursing education.

Although it did not come up directly in the evaluation (i.e. it was not mentioned by staff or students), the observers noted that the manikins included a diverse mix of skin colour, age and gender. This is clearly an important aspect of realism (as the students are a very diverse group and are likely to be working with a very diverse patient population and colleagues in the NHS). The evaluators asked staff about this informally after the evaluation was complete and staff noted that :

“When purchasing our manikins we also ensure we have a diverse mix of skin colour, age and gender. Anecdotally comments are often made that it is positive to see such a variety. These comments are made by students when taking part in simulations and also when we take people on tours around the sim ward.”

It seemed that the equipment in SIMS week was extremely diverse as discussed and the scenarios did also reflect a diverse staff and student population.

6 Conclusion

In this section, the extent to which project objectives have been achieved is assessed.

6.1 Project objectives

There is considerable evidence of progress towards the stated objectives during SIMS week. There is strong evidence from all data sources that students did find the scenarios a safe learning environment and that they were immersed in the scenarios. Survey, focus group and observation data show strong evidence that students improved their clinical skills, and their confidence generally across the SIMS week and there was some evidence that decision making skills were also developed. Observations provided strong evidence that emotions and feelings were important in learning in the scenarios and the debriefing sessions were effective in encouraging exploration/reflection on feelings and learning. The observation of the debriefing sessions suggests that the debriefing sessions were used to encourage or facilitate links between theory and practice and that this was having an impact on students' learning.

6.2 Summary of progress against stated project objectives

Below we summarise the extent to which the project objectives were met, based on all the data collected.

Project objective	Assessment of progress towards the objective
a) To discover whether within a simulated safe learning environment using different scenarios, students can immerse themselves into a situation where they can explore their feelings, absorb knowledge and practice skills which they may encounter within clinical practice.	There is strong evidence from all data sources that students did find the scenarios a safe learning environment and that they were immersed in the scenarios.
b) Students have a simulated base learning period within a simulated environment (online and in the skills centre) to enhance nursing skills and develop decision-making skills.	Survey, focus group and observation data show strong evidence that students improved their clinical skills, and their confidence generally across SIMS week and there was some evidence that decision making skills were also developed.
c) Students will be able to explore their feelings about situations they may encounter within clinical practice through scenario-based learning.	Observations show strong evidence that emotions and feelings were important in learning in the scenarios and the debriefing sessions were effective in encouraging exploration / reflection on feelings and learning

Project objective	Assessment of progress towards the objective
d) Through reflection and peer learning within the simulated ward, students will demonstrate their understanding of how technical and non-technical skills impact on how they deliver care and interact with people.	This was difficult to evaluate from the findings as the objective was perhaps a little complex in wording. Certainly there was good evidence of reflection and peer learning during SIMS week.
e) Students will be able to reveal their knowledge and understanding by working through scenarios in a timely manner.	Most or all students were able to understand/complete the scenarios with the exception of some of the online activities.
f) The debrief following the scenario will encourage the application of theory to practice learning and ensure students have demonstrated the correct technical skills and their ability to escalate and handover appropriately in the scenario.	The observation of the debriefing sessions suggests that these were being used to encourage or facilitate links between theory and practice and that this was having an impact on students' learning

7 Limitations

There were some important limitations of the evaluation in terms of the research design and period of data collection. In particular, the evaluation only covered the week in which first-year students were using SIMS and the experience of second and third year student may be different. First-year students who have not had placements or have had few placements are more likely to need their confidence boosting which appeared to be one of the main outcomes of SIMS week. It is possible that by only looking at first-years the impact of SIMS might be somewhat over estimated.

Secondly it is worth noting that the vast majority of survey participants (57.1%, n=16) were from MH specialty and this group also formed 50% (n=6) in focus group1 and 57% (n=4) in focus group 2. Based on departmental data for the 2022 pre-registration nursing intake, MH students have a distinctive demographic profile compared to other groups in terms of age (the average age of MH students is 43.06 years, compared to 34.46 for adult and 24.3 for CYP students. MH students are much more likely to be male (39.3%) and of Black ethnicity (85.7%) compared to other specialities.

Thirdly, there was no control group to compare to (i.e. a group of students which did not take part in SIMS week). A final limitation is to note was that it was not possible, with the available resources or time, to follow nursing students through into practice to assess how participation in SIMS week might have affected their behaviour or competencies in practice over time, or what effect any such changes might have within the NHS (e.g. patient outcomes or satisfaction). We were therefore not able to measure impact per se (i.e. long term 'embedded' change).

More strategic evaluation of SIMS is needed in order to judge its impact. This evaluation is an important step towards that but was limited in a number of ways as discussed above. With more advance notice and more resources a more thorough evaluation could be designed which captures the experience of students in different years of the programme and how the SIMS experience may relate to their placement experience and their post-registration practice experiences. There is a conviction amongst many staff that SIMS is effective and there is considerable evidence to support that (as presented in this report) but it is also important to have more valid and reliable evidence regarding its effectiveness going forward and to judge that against clearly defined objectives which ideally include more measurable outcomes.

Despite these limitations, the research design was thorough and rigorous, incorporating quantitative (student survey) and qualitative methods (observations and focus groups with staff and students) and the evaluation did have 'pre and post' elements in relation to the survey and focus groups with staff and students. Most published evaluation relates to simulation interventions which are much shorter than a week (Cant and Cooper 2017) so this evaluation was better placed than many other studies to look at how the

intervention and its outcomes developed over a period of time but clearly a week is not a sufficient period of time on which impact (long term or embedded change) can be judged.

The evaluation could be classified as being in stage 2 (b) of the Kirkpatrick hierarchy in terms of the outcome variables or ‘effects’ of the SIMS initiative which were evaluated, whilst acknowledging the limitations of the Kirkpatrick model as highlighted by Yardley and Dornan (2012) and others. As Johnston et al. (2018) note, based on a systematic review, there are very few studies of simulation in health professional education which go beyond stage 2 of the Kirkpatrick model. This is because looking at the higher-level outcomes in this model would involve follow-up work at considerable periods after the simulation intervention and following students into practice as well as the use of sophisticated research designs such as RCTs in order to make valid judgments about impact on patient outcomes, for example. These research designs require a significant budget and almost certainly would also require NHS REC ethical clearance, which can take a considerable period of time.

Figure 4: Kirkpatrick training evaluation levels.

Kirkpatrick levels					
1	2a	2b	3	4a	4b
Participation	Attitudes	Knowledge and/or skills	Behaviour	Organisational practice	Benefit to patients

(adapted from Yardley and Dornan 2012)

8 Recommendations

In this section some recommendations are made, based on the evidence gathered and the conclusions reached. As the use of SIMS in the ACM department at Middlesex is still at a relatively early exploratory stage, and as there are limitations of the evaluation data these are proposed tentatively as suggestions to be considered.

- a) On the whole, students clearly enjoyed SIMS week and felt that they got a lot from it in terms of skills, learning outcomes and confidence and that was also the view of most staff. However the online days were viewed as somewhat less valuable both by students and some staff. This may be inevitable to some extent as students may always prefer the realism and immediacy of ward-based scenarios and particularly those which involve actors but it may be worth exploring whether there ways in which the online experience can be developed.
- b) Based on observation data it seemed that there was a need to improve the instructions to students during online teaching sessions before they go into breakout groups and for more supervision by a staff member to ensure that students are actively participating in the breakout groups, that they understand the activities and that they have their cameras switched on.
- c) Related to the above point, it may be worth reviewing the extent to which students are made aware of the need to assist and support each other's learning (i.e. peer learning) and the extent to which this can assist student learning especially in the online days of the SIMS week.
- d) It may be useful to review potential barriers to student participation in future delivery of SIMS in this way. Although the majority of students did not experience barriers to participation to a significant extent (based on the survey data) there were some barriers for a minority of students. For the online days these related to the lack of a quiet/comfortable environment at home, poor quality/low speed internet, lack of IT skills or access to devices or having to compete with other members of the household for access to a device. The survey data suggested even fewer barriers to participation for the days at StoneX; the focus group and observation data found some evidence of digital inequity and other barriers such as the timing of SIMS week in relation to impending coursework deadlines, the difficulty and expense of travel to StoneX for some students. The amount of notice which students received about SIMS week and being very clear that it is mandatory are also likely to be relevant to participation rates. Although these barriers may only affect a minority of students it is still important to monitor these and to investigate possible ways of minimising them where possible.

- e) The current 'offer' to students (from September 2023) is one week of SIMS in each year of their programme. It is clear that students who took part in SIMS week would like to use it more. It is likely that as they recommend it to peers, demand will continue to grow. As staff are likely aware this raises questions of whether the demand can be met and what the cost may be (in staff time, equipment etc). It perhaps also raises issues of whether staff will be able to cope with the level of pressure in SIMS week when there are fewer staff per student and less opportunity to take weeks off from this work.
- f) A related issue is the extent to which SIMS week will remain effective when delivered with fewer staff per student than was the case during the evaluation and whether it might become less satisfactory to students generally. The internal evaluation used by the teaching staff may be able to pick up any decline in satisfaction from students and clearly this data should be reviewed periodically, perhaps with external support on the data analysis if needed.
- g) The department may wish to consider what training/support is needed for staff and whether they would wish to have an explicit strategy around this in terms of which staff need to have what particular training. For example, is the number of staff trained in debriefing adequate? Staff may also wish to consider if there is an adequate 'pipeline' of staff coming through who can support the SIMS work, to support likely future expansion.
- h) It might be useful to consult with staff and students on the detail of how SIMS can or should be integrated into the curriculum i.e. which modules, which programmes, which learning outcomes or objectives are intended and how these will be assessed.
- i) It maybe that a more explicit or unified pedagogical approach which aligns with pedagogical approaches used to underpin the curriculum generally, would be beneficial. Although most staff instinctively aligned themselves with constructivist approaches and that the scenarios and learning activities were being designed with clear learning outcomes in mind, time did not always allow for a deep consideration of the pedagogical approach or options or how these integrate with the pedagogical approaches used to underpin the curriculum generally.
- j) It may be useful for staff to consider how the SIMS week relates to other educational technology which the ACM uses such as the Oxford Medical Simulation (OMS) software which is currently only available to 3rd year students, and whether it is possible or desirable to have a single strategy that encompasses all simulation and virtual reality facilities, across all programmes in ACM.

- k) It is recommended that when external evaluations are taking place (such as the one reported here) that any internal evaluations such as regular feedback surveys which staff carry out with students should be suspended to avoid students feeling 'over researched' which could lead to low participation in all forms of evaluation or lower quality responses. Data provided from an independent external evaluation will usually be of higher value than data from informal internal evaluations and it is unhelpful to run both at the same time.

- l) There is very wide divergence in the demographic profile of students, by specialty. Departmental data shows that MH students are far more likely than adult or CYP to be of Black African or Black Caribbean ethnicity, to be male and the average age of MH students is twice that of CYP students. It is unclear what implications there may be for SIMS but the inverse correlation between age and IT skills still persists and might mean that students in some specialities require more support or preparation for the online days.

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10 Appendices

10.1 Appendix 1: SIMS WEEK in photographs - the user experience

To give readers a visual idea of the simulation facilities at the StoneX campus, we share some photographs of the facilities, students and teaching team.











10.2 Appendix 3 Participant observation schedule

Non-participant observation schedule Drawing on Spradley R (1980) [Participant observation](#) Holt, Rinehart and Winston

Date Location Duration of observation
ACTORS: No: lecturers/students Characteristics of participants (Yr of study) Anything out of the ordinary happen during session?
SPACE, OBJECT, SETTINGS: What is the ambiance of the room? Physical condition of classroom - Rundown or modern? - lighting and temperature? – Distractions and acoustics? Available space? Layout? Resources and equipment?
ACTIVITIES AND INTERACTIONS What subjects were the activities integrated with? Was any prior learning drawn upon/referred to? Barriers or facilitators to delivering the activities (i.e. environment, knowledge, infrastructure, time)?
QUALITY OF DELIVERY Teacher's overall effectiveness Demeanour?

Time keeping?

Adherence to lesson plan/simulation week's learning objectives?

What simulation methods were used?

Could everyone see? Were they engaged?

Group work?

Class discussion?

PUPIL ENGAGEMENT

Attentive?

Enjoying?

Were the students interacting in the session?

Were they actively participating in the session?

Did the activities appear to develop communication skills amongst students?

Did students' level of engagement differ? Participation? Behaviour?

10.3 Appendix 4: Online questionnaires for students and focus group topic guides

Copies of the online questionnaires and focus group topic guides can be obtained on request from the researchers (email m.odriscoll@mdx.ac.uk or h.allan@mdx.ac.uk).

10.4 Appendix 5: ACM department statement on their simulation strategy



Simulation Strategy for Nursing and Midwifery Programmes

Definition

Simulation is “an educational method which uses a variety of modalities to support students in developing their knowledge, behaviours and skills, with the opportunity for repetition, feedback, evaluation and reflection to achieve their programme outcomes and be confirmed as capable of safe and effective practice.” (NMC, 2023)

Strategic Aim

To empower our students to develop their knowledge using simulation to improve their nursing skills and building confidence by giving them the opportunity to practice in a safe environment facilitated by our experienced clinicians and educators. We aim to provide a seamless transition from the classroom to the clinical setting, developing the knowledge and skills of our students to meet the ever changing complex needs of our healthcare.

Middlesex Simulation Centre

Situated in the beautiful surroundings of StoneX Stadium, home of the Saracens Rugby Club. Our simulation centre has state of the art facilities including CAE My Learning Space offering an end to end spectrum of simulation solutions including patient interventional and imagining simulation, audio visual solutions and learning applications. Our simulation centre is set across two floors. It comprises of a variety of teaching and simulation rooms. These include two 4-bedded wards with a control room which provides an interactional learning experience for our students. The simulation centre also has an additional 4 bedded ward along with individual and separate intensive care facilities which include adult, paediatric and neonatal ITU rooms and a further paediatric ward and a 3 bedded midwifery suite including a birthing pool. There are 8 teaching classrooms where we facilitate the theoretical learning of nursing skills, using augmented and virtual reality experiences with our specialist equipment to provide an enhanced learning experience.

In addition to these we have fully equipped specialised teaching rooms for the delivery of venepuncture, cannulation and catherization, a community flat, consultation rooms, PMVA room, sluice room and moving

and handling room. We are developing a sensory suite which allows for the development of nursing skills to care for patients with learning, sensory or developmental disabilities in a safe, therapeutic space.

The simulation centre has access to a modern café which provides refreshments with an opportunity to meet and relax, accessible to students and staff. There is also a male and female multi-faith prayer room.

Simulation teaching

We use a range of low to high-fidelity manikins. Many of our manikins are fully body electronic simulators that can breathe, talk and respond to treatments both in an acute and non-acute clinical situation. In collaboration with our service users we have developed simulated scenarios which are based on real life clinical situations allowing our students to gain experience in the assessment and treatment of patients. In addition to using this specialised equipment an opportunity for feedback, evaluation and reflection on student performance is provided, enhancing their skills and confidence further.

In addition to technical skills we facilitate the development of non-technical skills which include interpersonal, communication, leadership, teamwork, situational awareness and clinical decision making. To facilitate these essential skills we use manikins and actors who play the part of a patient which can help students to practice a variety of skills such as active listening, asking questions, compassion and empathy. These simulations are an important part of our education strategy in our simulation centre. Our actors are appropriately trained to respond and to provide feedback and also involved in all de-brief sessions which provides the students the opportunity to reflect on their practice. We are developing an application to enable students to use electronic patient record documentation to consolidate their skills, in line with the digitalisation of healthcare.

We give our students the opportunity to access a supervised drop-in session where peer learning occurs which allows students to gain further practice with any of their clinical skills. Our simulation facility is committed to ethical standards in education and training, all roles including those of a facilitator, technician, actor or other roles are responsible for acting with professional integrity and developing self-awareness of how one's personal and professional behaviour affects those around them. Our simulation centre embraces the diversity of our staff, students and colleagues across the wider community.

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