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Featured Article

Balancing the Budget in the Simulation Centre

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Abstract: Over the last few years, the demand for simulation has increased exponentially in health care programs such as nursing. The challenge faced by simulation centres is to respond to the needs of educational programs while respecting budgetary constraints. In this article, we discuss several innovations designed by our simulation centre to decrease operating costs in the areas of supplies and equipment and increase revenues related to space utilization.

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Simulation, in Canada, as elsewhere, is used to help students develop the professional competencies and skills needed to practice in health care. In nursing education, simulation and clinical placement experiences are seen as "essential components of nursing curricula" (CASN, 2015, p.13). Experiential learning through simulation is viewed as an effective and safe way to prepare students to apply education to practice. Simulation time increased significantly when a research study suggested that up to 50% of clinical practice hours could be replaced with simulation (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014) and recent evidence provides further support for a 2:1 clinical to simulation ratio as simulation provides an "intense, efficient learning environment" (Sullivan et al., 2019, p.41). For all those reasons, simulation centres are now an integral part of nursing programs.

The costs to create, operate, and maintain medium- to high-fidelity simulation lab experiences are high (Gates, Parr, & Hughen, 2012) and sustainable funding is a concern (Qayumi et al., 2014). In addition to the building and operating costs, there are costs associated with personnel and faculty development. Finding ways to balance the books is important as the demand for simulation increases.

George Brown College is home to a 21,000 square foot state-of-the-art simulation centre with four high-fidelity suites, adjacent debriefing rooms, an operating room, a fully functioning bachelor apartment, and five 12-bed simulation practice labs. Our centre contains up-to-date technology and highly trained simulation staff. It provides a variety of practice settings including hospital, long-term care, and home. In the 2017/18 academic year, approximately 1,850 learners used the high-fidelity component of the centre. Although learners are predominately prelicensure nursing students in practical nursing, baccalaureate nursing, and bridging programs, students also come from numerous other programs. For all students, we are committed to providing users with learning experiences that closely mirror the real world to prepare them for practice. The centre strives for excellence and aims to follow best practices as outlined in The International Nursing Association for Clinical

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Simulation and Learning Standards of Best Practice: SimulationSM: Operations (2017). Our hard work was recognized by being the first college and nursing school in Canada to receive the Society for Simulation in Health care's Accreditation designation.

Key Points

- The increased use of simulation centers has resulted in budget challenges.
- There are innovative ideas to help balance the budget.
- Cost savings and revenue generating ideas for simulation centers are provided.

Users of the space contribute payments towards the centre's operating budget. As costs to operate the centre continue to rise, we found creative means to sustain and expand the centre. In addition, some of our cost saving strategies also align with the "reduce, reuse, recycle" policy to decrease the college's environmental footprint. This article shares several initiatives that were launched to decrease operating costs and increase efficiencies and revenue for the centre. It is important to note that we are an educational facility and we do not provide health care; therefore, our initiatives do not present health risks to clients.

Cost Savings

Supplies

One of the ways we are able to realize cost savings is by reusing supplies. Primary infusion tubing costs approximately 13.00 CDN, and secondary infusion tubing costs approximately 7.00 CDN per unit. Our centre uses approximately 1,400 primary infusion lines and 2,500 secondary infusion lines annually. We developed a process to recycle lines, which costs about $0.10 per line in supplies. The process involves flushing the lines of any fluid residue and saline crystals, blowing the lines out with air, and then repackaging them (see http://www.gbcrooms.ca/). Currently, we are able to recycle approximately 30% of the lines used in the centre. A cost analysis identified a savings of approximately $10,600 in the last fiscal year.

In 2017, there was a shortage of standard saline intravenous (IV) solution bags, so we started to create our own. We use approximately 2,200 IV bags per year. We now refill IV solution bags with a combination of distilled water and copper sulfate ($CuSO_4$) using a ratio of two drops of $CuSO_4$ to four litres of distilled water. $CuSO_4$ prevents algae and microorganism growth in the bags. The cost of an authentic IV bag is approximately 5.00 CDN; it costs about $.60 for supplies to make our own. Each time a bag is recycled, the centre saves approximately 4.40 CDN. As this is currently a pilot project, only approximately 10% of the bags are recycled.

More recently, the centre has expanded its recycling efforts to include suction catheters. We use approximately 500 catheters per year at a cost of $2.00 each. Students return about 50% of these for repackaging. It costs $0.10 to repackage, so we save approximately $475.00.

We create all bodily fluids from readily available products for pennies rather than purchasing them. These fluids include regular blood, old thick blood, blood clots, urine, enteral feed, pus, and feces. A recipe book has been created to help standardize the process for our employees.

Recently, we advocated to purchase inventory software. At first, it was difficult to obtain approval for this software, but once management realized the cost would be repaid many times over by improving efficiencies, the software was approved. This change resulted in refined purchasing practices and decreased stagnant inventory.

Equipment

Equipment such as high-fidelity simulators are expensive to purchase; therefore, we aim to keep the equipment in optimal running order to prolong product life span.

When we do buy equipment, an extended warranty package is often offered for a fee. Instead of buying extended warrantees, we redirect the $18,000.00 per year to employing 0.6 full-time equivalent simulation technologists. The technologist hired has a number of roles besides maintaining equipment. We found training our technologist through the Laerdal training course on SimMan 3G was more cost-effective than purchasing extended warranties on our manikins.

Making equipment last longer is another goal. We are able to do this by ensuring preventative maintenance is performed at regular intervals and using the simulators for their intended purpose. Part of this initiative is to align curriculum to equipment; we use the least expensive product that enables students to meet learning outcomes. For example, if we are teaching cardiopulmonary resuscitation, we will use the $250 trainers instead of the $125,000 manikins. As a predominantly undergraduate nursing school, physical demands are not extensive on the manikins and equipment. For example, ventilation, intubation, and defibrillation are not part of our curriculum, which reduces wear and tear compared with manikins used in acute trauma simulation centres. We use preventative maintenance, including part replacement and part harvesting to repair identical equipment to promote longevity for equipment such as beds, wheelchairs, IV arms. Our technologist is trained to repair equipment, so when a part needs to be repaired, it is completed in a timely manner. Cost savings in these areas provided the means for us to venture into other areas including virtual gaming simulation, augmented reality, hybrid simulations, and the simulated participant.

More recently, we started to use 3D printing to produce items at a lower than purchase cost. For example, parts for

IV arms, IV collection bag holders, dental x-ray holders, and simulated thermometer cases are designed and created by simulation centre staff. The 3D printer was purchased for approximately 3,000.00 CDN. Soon after purchasing the printer, we created a part for $10.00 that retails for $260.00 per unit. Because we needed ten of this item, we realized most of the cost of the 3D printer immediately.

Space

Space utilization is tracked annually via our new online booking system and reported in the Simulation Centre Annual Report. In 2018, simulation centre space was used 50% of the time, Monday through Saturday, 0700 to 1800, including break weeks and examination periods. The system, administered by our support officer and manager, responds to requests immediately allowing for emergency use of our facilities when there are outbreaks or other situations that prevent students from going to clinical practice. We expect increased utilization because of our new online booking system.

Flexible space in the centre is key; portable desks, chairs, and moveable technology allow us to transform a classroom to a clinical practice setting to meet changing demands. This space can accommodate hospital beds because of the wider doorways (48'') and has built-in infrastructure (hand washing stations) allowing for easy repurposing of space. This infrastructure flexibility promotes optimal space utilization.

Personnel

Increased utilization of the centre has led to an increase in staff. In November 2015, the centre included these full-time employees: 1.0 support, 1.6 simulation technologists, five part-time students performing front-line duties funded through governmental grants and work study programs. Through remodeled approaches of simulation, there are now 1.0 simulation manager, 1.0 support, 1.6 simulation technologists, 4.0 nursing lab technologists, 20 part-time nursing lab specialists, and a 0.6 simulated participant. The nursing lab technologist and nursing lab specialist positions provide a consistent approach to simulation delivery and student support and creates jobs.

Two faculty, who were trained at the Centre for Medical Simulation (Harvard), run our in-house faculty training for aspiring simulationists. Regular training sessions are offered to meet the mandatory training requirement for all faculty working in the centre.

Revenue Streams

Supplementing operating budgets with external revenue generates revenue for the centre. Space rental for simulation activities during low uptake times is the main source of revenue. The simulation centre manager and the event manager issue the approval and contracts for rentals. Depending on the space required, rooms rent from $500.00 to $1,000.00 per day plus personnel, equipment, insurance, and taxes. In 2016, we signed an agreement with a repeat customer who uses the centre every year for 8 weeks to run relicensure programs for staff, providing us with a guaranteed fixed annual revenue. The centre is also rented for movie shoots. Our rental program is expanding as a result of advertising through the local actor's guild, simulation networks, and networking. These short- and long-term rental contracts are managed by the facilities department. The centre realizes most of the funds for most rentals; however, revenues from film shoots are divided between the event department and the centre.

Going Forward

The innovations described in this article are just the beginning of an ongoing endeavour towards the overarching goal to eventually balance the budget in the centre while increasing simulation uptake. Our plan is to achieve greater efficiencies through product reuse programs. We plan to increase our marketing and messaging to students to encourage them to return items for reuse. We set an achievable yearly target to increase specific item reuse such as infusion lines by 10%.

Our primary goal is education; therefore, the peak time to rent out the centre is May to August. Currently, parts of the centre are booked sporadically during this time. Our goal is to increase bookings, and revenues accordingly, by 10% next year.

Recently, we started to provide consultative services and educational sessions hosted by the centre or in conjunction with vendor partners. We provide consultative services on writing simulation scenarios, running simulation centres effectively, and on strategic simulation equipment maintenance and purchasing. In addition, educational workshops on different topics such as moulage and standardized patients are provided on an ongoing basis.

We are constantly learning best practices regarding efficiency. For example, we learned that resealed 500 cc IV bags can only be stacked in piles of five or the bottom IV seal breaks from the pressure of the other IV bags. As we recycle lines, we are learning the optimal number of times that lines can be recycled before they need to be thrown out. We use this learning to constantly refine our processes.

Conclusion

Simulation hours are increasing exponentially in the education in health care programs such as nursing. Our centre aims to be responsive to the simulation needs of

the educational programs while staying within budgetary constraints. The suggestions provided in this article are transferrable to other simulation centres and may provide simulation managers with ways to increase their financial stability. Our hope is that this article stimulates discussion and that other simulation managers share their strategies related to efficiencies, cost savings, and revenue streams so we all can learn and benefit from each other.

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