The Impact And Future Of Technology In Nursing Education

Maeitm Abdurhman Alhafi , Tayser Naser Alotaibi , Saeed Badr Aldleem , Sharifah Yahia Maswadi , Abdulaziz Mohammed Al-Nafaie , Maha Abdullah Alotaibi Samia Mohamd Alotaibi , Wed Mekhdari Algezani , Ghadah Saud Alanazi , Mada Swayed Algezani , Nayfa Maadhad Al-Mutairi , Hayfaa Mohammed Shuraidh , Nawal Ali Ezzei Refaei , Alanoud Alsaif Ali Hakami , Shemah Mohamed Ali Hakami

Abstract:

Technology is being used more and more in nursing education, which has many advantages but also presents a number of difficulties. This study examines the use of technology in nursing education, emphasizing its benefits, drawbacks, and potential applications. Many technology technologies have been used to improve student learning and get them ready for the workforce, including social media platforms, e-learning, and simulation learning. Although technology makes education more accessible, it also raises issues like higher staff workloads and budgetary strain. Despite hurdles like technostress and the inability to effectively fulfill the needs of each individual student, nurse educators are essential in helping the curriculum integrate technology. Artificial intelligence and gaming activities are two examples of how future technological developments could improve nursing education.

Keywords: nursing, technology, facilities, healthcare, education, learning, and students.

Introduction:

Our healthcare system has incorporated technology with ongoing advancements and modernization. The increased utilization and adoption of technology in educational environments guarantees that students are suitably equipped to enter the workforce. Educational institutions now have more technology and are always incorporating cutting-edge learning

systems. Numerous technological tools are available to nurse educators in order to enhance student learning and better prepare them for graduation. For students who live in rural areas who might not be able to physically visit educational facilities, technology has improved accessibility to learning. Technology used in nursing education can include tablets like iPads, smartphones, e-books, laptops, and simulation learning. Despite its broad nature and associated difficulties, technology is an indispensable tool in today's educational setting. An insightful and thoughtful summary of the advantages, worries, and creative and hopeful possibilities that technology presents for nursing education is given in this essay. Technology has grown in popularity as a teaching tool and is essential to the modern classroom (Merrill, 2015). Technology is used in nursing education in many different ways these days. For instance, high-fidelity and low-fidelity simulation give students case-based experiences and allow them to practice practical skills (Tosterud, Hedelin, & Hall-Lord, 2013). Many nursing programs now include technological innovations like e-learning, which makes learning more affordable and convenient for students who are located in remote areas (Sheikhaboumasoudi, Bagheri, Hosseini, Ashouri, & Elahi, 2018). Numerous educational institutions have focused on adopting new methods of delivering instruction through rebuilding initiatives, changes to the budget, and more assistance to teachers (Benjamin & Ostrow, 2008). Technology is a broad subject that has greatly improved nursing education in the modern day. It is crucial that, as technology develops, the value of delivering top-notch patient care is not eclipsed in the eyes of the next generation of nursing students (Mahon, 2017). The use of technology in educational settings, by nurse educators, and by nursing students is examined in this article. Additional discussion of these topics will highlight the advantages, challenges, and future prospects of technology.

An Overview of Technology Use in Educational Settings

Advantages of Technology Use:

There is a lot of demand on educational institutions to make sure that technology is appropriately incorporated into classroom settings (Gonen & Lev-Ari, 2016). When one looks back over the past ten years, one can see that the technology used in educational institutions has increased significantly and undergone many improvements (Damewood, 2016). The emergence of web-based, or e-learning, delivery methods for education is a noteworthy shift. The need for greater

accessibility and a rise in student demand to learn in their homes is the main driver behind this change in the way education is delivered (Damewood, 2016). programming remotely;

One significant development for educational institutions has been the idea of electronic distant learning (Sowan & Jenkins, 2013). For the most part, facilities have found it easy to adopt this change because students and teachers have ready access to computers and the internet (Sowan & Jenkins, 2013). By definition, distance programming is delivering pre-developed course materials to students who are not in physical contact with their teachers through a variety of technological platforms (Griffiths, 2016). It is possible to teach programming synchronously—for example, through video streaming or virtual chat—or asynchronously—for example, by sending an email or posting on a forum (Sowan & Jenkins, 2013).

Find out where you now reside:

The University of Saskatchewan's introduction of the nursing program Learn Where You Live in 2012 is one instance of how to include distance learning into curricula (Butler, Bullin, Bally, Tomtene, & Neuls, 2016). This program's mission was to better help the indigenous population; its set of goals was to meet community demographic preferences and reach people who couldn't physically attend programs because of their remote location (Butler et al., 2016). According to Butler et al. (2016), students in the program received instruction in the comfort of their own homes and maintained virtual contacts with teachers via phone calls or the internet. Success was demonstrated when this initiative was reviewed and the first group of participants graduated—the entire class was awarded credentials as registered nurses (Butler et al., 2016). The provision of adequate education through a remote manner and, most significantly, improved health care in the north were the criteria used to measure the effectiveness of the program (Butler et al., 2016). Because it gives everyone equal access to education, distant education promotes social equality in addition to serving as a tool for learning (Smith, 2008).

Online video streaming

The utilization of web-based streaming and real-time TV interactivity in instructional programs is another beneficial technical advancement (Smith, 2008). With the use of technology, educational institutions may reach more students without having to make structural changes to their buildings. Additionally, it guarantees that students engage with one another and develop meaningful relationships (Smith, 2008). In general, students are in favor of this kind of technology use since it fosters a relationship between them and their teachers, increases empathy, and simulates being present even when they are not physically present in class (Smith, 2008).

Learning through simulation:

Another popular technology used in instructional programming is simulation learning (Damewood, 2016). Both high-fidelity and low-fidelity simulation give students greater practical experience, let them imitate real-world scenarios, and help them advance their nursing knowledge in a safe environment (Tosterud et al., 2013). Mannequins that mimic human systems, including respiratory, cardiac, and speech tones, are used in high-fidelity simulation (Przybyl, Androwich, & Evans, 2015). Every mannequin comes with software that presents realistic case scenarios and can be customized to meet specific learning objectives (Przbyl et al., 2015). Low-fidelity simulation is more basic; it uses an arm to insert an intravenous needle or the torso to rehearse cardiopulmonary respirations (Przbyl et al., 2015). Students can provide recommendations to one another and reevaluate methods for handling case scenarios they have previously experienced by using a variety of nursing skills in educational settings (Berragan, 2014). Many nursing programs are now well-accredited, and the use of simulation has increased in popularity (Sanko, 2017). Although the equipment was initially extremely expensive, its cost has decreased over time, which has helped educational establishments integrate and run simulation more effectively (Sanko, 2017).

Issues related to the use of technology:
Concerns about the increased deployment and operation of technology have arisen in educational facilities as its use among nursing educators and their student body has grown. Obstacles have emerged primarily as a result of increased work pressure

that employees have expressed as well as increased financial pressures that certain educational establishments are experiencing (Damewood, 2016).

Staff burden:

According to Damewood (2016), educational institutions must have enough repair and support staff to handle the increasing upkeep, operation, and repair work brought on by the diverse equipment as a result of the growing usage of technology. These workers are now in charge of all connected technology that comes along with integrating new equipment, when in the past they might have only been responsible for servicing computers (Damewood, 2016). In addition to regular maintenance, educational facilities have to meet set standards, thus these staff members need to be well trained in using and maintaining a variety of technologies (Dudding & Nottingham, 2018).

Pressure on finances:

Depending on the kind of equipment to be included, educational facilities may incur different costs when considering to introduce or advance technology (Dudding & Nottingham, 2018). Many organizations nevertheless acknowledge that these increased costs are a persistent obstacle, even though these fees are now more affordable (Benjamin & Ostrow, 2008). Continuous repairs, equipment upgrades, or the replacement of broken parts are examples of factors that put students under additional financial strain and may eventually force facilities to raise tuition, adding to the already severe financial burden that students already bear (Benjamin & Ostrow, 2008). As long as educational facilities continue to incorporate technology, the aforementioned challenges will inevitably arise.

Future Technology Use:

There are a lot of opportunities and innovative, current methods for using technology in educational facilities in the future (Glauser, 2017). In order to extend the use of contemporary technology, boost instruction, and provide future students with an improved learning environment,

numerous educational institutions look to form collaborations with international institutes (Goldsworthy, 2012). There is extensive usage of technology in educational facilities, regardless of how students are taught or how technology is incorporated into teaching (Goldsworthy, 2012).

Video games:

The potential to include gaming activities into nursing curricula is one technological future. Due to its ability to keep students' attention and provide an enjoyable learning experience, gaming has grown in popularity in healthcare settings (Ferguson, Davidson, Scott, Jackson, & Hickman, 2015). Students can utilize the gaming platform to configure and modify patient variables on their own personal electronic devices, such as tablets or mobile phones (Ferguson et al., 2015). As an illustration, the game might imitate a situation in which a student administers medication to patients in real life (Glauser, 2017; Ferguson et al., 2015). The game would notify the player right away and provide helpful criticism if a step was missed or an error was discovered (Glauser, 2017). According to Glauser (2017), the game would let pupils go to multiple levels and, most significantly, would make learning possible whenever and whenever.

Social Media:

Another significant advancement that relates to the use of social networks is the term Free Open Access Medical Education (FOAM) (Carroll, Bruno, & vonTschudi, 2016). FOAM is defined as a social media platform that allows students to interact with one another and use web applications like YouTube, blogs, and Twitter. According to Carroll et al. (2016), social networking is becoming more widely recognized as a useful learning tool, and many educational institutions are encouraging this trend. Affordability—many social networking apps are free to use—open accessibility for educators and students, and ease of implementation in educational settings are some positive factors that encourage the further use of FOAM (Carroll et al., 2016).

One drawback of FOAM is that it has limited control over the content that can be checked online by facilities due to their limited ability to regulate online discussions and debates

(Carroll et al., 2016). Social networking is a hot issue, and as technologies and applications advance, it will become increasingly common to use social networking as a learning tool (Carroll et al., 2016).
A synopsis of nursing educators' use of technology

Advantages of Technology Use:

Large rooms and a larger student-to-teacher ratio are features of modern classroom environments, which might be intimidating for certain people (Revell & McCurry, 2010). In order to help overcome these obstacles and improve the relationship between teachers and students, technology has been introduced into the classroom (Revell & McCurry, 2010). Prior to graduation, nurse educators must educate their students the fundamentals of technology and how to use it appropriately, according to a requirement set by the Canadian Association of Schools of Nursing (Canadian Association of Schools of Nursing and Canada Health Infoway [CASN/CHI], 2012). This ensures that graduates can perform safely and knowledgeablely in a variety of healthcare settings and certifies that all students have gained the same degree of understanding for operating technology (CASN/CHI, 2012).
Using technology in a productive way

Students see nurse educators as vital because they serve as role models and eventually shape the next generation of nurses. It is crucial that teachers use technology in a welcoming and capable manner. This guarantees that students get the most of their education and use technology responsibly. Teachers should have a positive work atmosphere, access to useful information and technology personnel, and be encouraged to be creative in their approach to teaching in order to facilitate the integration of technology into their lessons. Taken collectively, these initiatives will enhance their adoption and encourage continued use of technology (Gonen & Lev-Ari, 2016).

Stressors related to technology:

Since it is expected that technology would be used in their lessons, nurse educators face increasing responsibilities and anxiety in their current work environment (Burke, 2009). Although the word technostress gained traction around 1980, many nursing educators experience this common emotion

(Burke, 2009). Technostress is characterized by feelings of anxiety and uneasiness brought on by the general use of technology in the classroom and the routine tasks associated with teaching (Tacy, Northam, & Wieck, 2016). Teachers often report feeling burdened by responding to many forms of technology, such as checking email while conducting an online class. Technology is clearly overused, which has resulted in a fall in the desire to utilize it and a decline in job satisfaction (Tacy et al., 2016). Teachers observe that technology can be exhausting and frequently puts the most strain on them in their positions (Burke, 2009). It appears that faculty members need to pay attention to technology because there are fewer and fewer qualified educators in educational facilities (Revell & McCurry, 2010).

Developing a relationship with students:

One further frequent difficulty that nursing instructors mention is interacting with students and meeting each individual's need. It is not easy to reach every student because they have different learning styles and levels of technical experience (Bowen et al., 2010). Teachers observe that trying to connect with their pupils while simultaneously making adjustments and establishing better methods for integrating technology is a constant battle. In addition, nursing educators come from diverse generations, have varied backgrounds, and offer a wide range of specializations and skill sets (Rajalahti et al., 2014). It is assumed that nurse educators will have a similar comprehension of and proficiency with different forms of technology to their frequently younger pupils; as a result, these discrepancies have led to some notable situations. To guarantee that nurse educators can properly operate and integrate technology, a foundational education must be provided as they continue to use it. By doing this, barriers would not only be addressed but future work performance would also be improved, since technology is expected to remain a crucial component for nurse educators.

Future Technology Use:

Hand-held gadgets, formerly considered unique, are now commonplace among educators and are rarely seen as a more recent kind of technology (Risling, 2017). With the advent of technology, educators may now teach their pupils in a plethora

of amazing and creative ways, and the next ten years are expected to bring with them even more cutting-edge technical platforms. More practice with Electronic Medical Records equipment is one more newer technology that is expected to appear in nursing curricula; nurse educators must assist students with the trial and error these instruments may bring. As upcoming student cohorts become the future workforce utilizing these tools in their everyday practice, instructors may also want to consider incorporating wearable technology into their lessons, such as sleep monitoring or calorie counting devices (Risling, 2017).

Availability:

Accessibility is another area where technology has excelled, as it allows students in remote locations to participate in educational opportunities without having to relocate (Butler et al., 2016). High travel and moving costs are often associated with physically enrolling in university-level programs, which can be significant obstacles. Without these technical advancements, learning might not have been a possibility for students around the world. Modern technology gives students the chance to study and engage digitally.

Future Applications of Technology:

Students of the future generation are frequently identified in various ways than those of previous generations. They have a strong affinity and devotion to technology in addition to projecting an air of affluence (Erlam, 2014). It has long been recognized that technology improves student preparation, is a necessary part of education, and guarantees that students can function well in the workplace of the future (Skiba, 2010). The opportunities for continued development and potential application creation are endless as a wide range of learning modalities, tools, and web-based apps are always being created (Au-Yong-Oliveira et al., 2017).

Generation Millennial:

The generation of kids currently in school is known as the millennial generation, and it is anticipated that they will bring more technology into the classroom (Au-Yong-Oliveira et al., 2017). Not only will kids have easier access to and exposure to technology, but many healthcare and educational

establishments anticipate having fully web-based environments (Skiba, 2010). Programming will continually incorporate the latest advancements in already-used technological modalities, such tablets and mobile phones, to better prepare graduates to treat patients with more complex chronic illnesses. Because simulation learning is flexible, scenarios can be modified to accommodate the evolving needs of the healthcare system and lessen any annoyances associated with clinical placements (Erlam, 2017). Future nursing student cohorts will have more access to sophisticated teaching strategies with a variety of technical modalities.

Synthetic intelligence:

According to Glauser (2017), robotics is a cutting-edge technology that is being brought to the healthcare sector and will affect aspiring nursing students. An artificial intelligence-enabled robot has been tested to interact with elderly residents of assisted living facilities, monitor their symptoms in tandem with nurses, and identify potential dementia warning signs. Students will be involved in both the development and adoption of this kind of technology, which is always evolving, in healthcare settings. Because robotics will eventually affect the duties and job needs of a nurse, students will also be expected to provide critical evaluations of these innovative technology (Glauser, 2017).

conclusion:

Technology offers nursing education countless options for development and evolution (Sanko, 2017). This involves nursing students using new technological modalities, nursing instructors integrating more technology into their instruction, and the spread of distance learning into educational facilities. Technology is a vast topic with a plethora of cutting-edge new modes to investigate. It is well acknowledged that technology plays a crucial role in delivering high-quality patient care, which highlights its significance in nursing education (Archibald & Barnard, 2018). When considering how technology might be used in the future, it is critical that it continue to be efficient, reachable, and meet the needs of the next generation of nursing educators and students (Dudding & Nottingham, 2018).

References:

1. Archibald, M. M., & Barnard, A. (2018). Futurism in nursing: Technology, robotics and the fundamentals of care. Journal of Clinical Nursing, 27(11–12), 2473-2480.
2. Au-Yong-Oliveira, M., Gonçalves, R., Martins, J., & Branco, F. (2017). The social impact of technology on millennials and consequences for higher education and leadership. Telematics and Informatics,35(4),171-177. doi:10.1016/j.tele.2017.10.007
3. Bassendowski, S., & Petrucka, P. (2016). Resetting nursing education. Online Journal of Nursing Informatics, 20(2), 6.
4. Benjamin, R., & Ostrow, L. (2008). Technology in nursing education.International Journal for Human Caring, 12(2), 57-64.
5. Berragan, L. (2014). Learning nursing through simulation: A case study approach towards an expansive model of learning. Nurse Education Today, 34,1143-1148 doi:10.1016/j.nedt.2014.03.005
6. Bowen D, Ezer H, Meoves J, Dyck N, Whitty-Rogers J, Thorne S, … Bot H (Eds.). (2010). Nursing educators: the view from here. Canadian Nurse, 106(7), 28–33.
7. Bristol, T. (2019). Educate, excite, engage: Policy for managing technology in nursing education. Teaching and Learning in Nursing,14(2), 135-137.
8. Burke, M. S. (2009). The incidence of technological stress among baccalaureate nurse educators using technology during course preparation and delivery. Nurse Education Today,29, 57–64.
9. Butler, L., Bullin, C., Bally, J., Tomtene, M., & Neuls, E. (2016). Learn where you live, teach from a distance: Choosing the best technology for distributed nursing education. Northern Review, 43, 39-49.
10. Canadian Association of Schools of Nursing and Canada Health Infoway (2012). Nursing Informatics Entry-to-practice Competencies for Registered Nurses. Retrieved from https://www.casn.ca/wp-content/uploads/2014/12/Nursing-Informatics-Entry-to-Practice-Competencies-for-RNs_updated-June-4-2015.pdf
11. Carroll, C. L., Bruno, K., & vonTschudi, M. (2016). Social media and free open access medical education: The future of medical and nursing education. American Journal of Critical Care, 25(1), 93-96. doi:10.4037/ajcc2016622
12. Costello, E., Corcoran, M., Barnett, J. S., Birkmeier, M., Cohn, R., Ekmekci, O., Falk, N., Harrod, T., Herrmann, D., Robinson, S., & Walker, B. (2014). Information and communication technology to facilitate learning for students in the health professions: Current uses, gaps, and future directions. Online Learning, 18(4), 1-17.

13. Damewood, A. M. (2016). Current trends in higher education technology: Simulation. Techtrends: Linking Research and Practice to Improve Learning, 60(3), 268-271.
14. Dudding, C. C., & Nottingham, E. E. (2018). A National Survey of Simulation Use in University Programs in Communication Sciences and Disorders. American Journal of Speech-Language Pathology, 27(1), 71–81.
15. Erlam, G. (2014). Simulation and 'millennials'–a great fit. Kai Tiaki: Nursing New Zealand, (1), 13.
16. Ferguson, C., Davidson, P. M., Scott, P. J., Jackson, D., & Hickman, L. D. (2015). Augmented reality, virtual reality and gaming: An integral part of nursing. Contemporary Nurse, 51(1), 1–4.
17. Garrett, M.B., Jackson, C., & Wilson, B. (2015). Augmented reality m-learning to enhance nursing skills acquisition in the clinical skills laboratory. Interactive Technology and Smart Education, (4), 298.
18. Glauser, W. (2017). Artificial intelligence, automation and the future of nursing: Technological change is already shaking up the profession. What is your relationship with technology going to be? Canadian Nurse, 113(3), 24–26.
19. Goldsworthy, S. (2012). High fidelity simulation in critical care: A Canadian perspective. Collegian, 19(3),139–143. doi:http://dx.doi.org/10.1016/j.colegn.2012.06.003
20. Gonen, A., & Lev-Ari, L. (2016). The relationship between work climate and nurse educators' use of information technology.Nurse Education Today, 391-6. doi:10.1016/j.nedt.2016.01.018
21. Griffiths, B. (2016). A faculty's approach to distance learning standardization. Teaching and Learning in Nursing, 11, 157–162.
22. Iverson, L., Ball, S., Harms, A., Murcek, C., Woods, S., & Young, T. (2016). Technology in the college of nursing: Perception and use to achieve learning outcomes. Online Journal of Nursing Informatics, 20(1), 12-1.
23. Jelec, K., Sukalic, S., & Friganovic, A. (2016). Nursing and implementation of modern technology. Signa Vitae, 12(1), 23-27.
24. Jones, D., & Wolf, D. (2010). Shaping the future of nursing education today using distance education and technology. Association of Black Nursing Faculty Journal, (2). 44.
25. Kaur, S., & Rawat, H. L. (2015). Importance of nursing informatics in nursing curriculum for utilization of information technology in nursing profession. Baba Farid University Nursing Journal, 9(2), 1-5.
26. Kuhn, E. (2017). Teaching in-demand skills: How healthcare educators engage today's students. Techniques: Connecting Education & Careers, 92(7), 18.

27. Mahon, S. (2017). After 100 years, nursing school is both different yet still the same. Oncology Nursing Society Voice, 32(11), 62–63.
28. Skiba D.J. (2010). Emerging technology: the future of nursing and the informatics agenda. Nursing Education Perspectives (National League for Nursing), 31(6), 390–391.
29. Smith, M. C. (2008). Caring scholar response to: Technology in nursing education. International Journal for Human Caring, 12(2), 65-67.
30. Sowan, A. K., & Jenkins, L. S. (2013). Designing, delivering and evaluating a distance learning nursing course responsive to students needs. International Journal of Medical Informatics, 82, 553–564.
31. Tacy, J. W., Northam, S., & Wieck, K. L. (2016). Understanding the effects of technology acceptance in nursing faculty: A hierarchical regression. Online Journal of Nursing Informatics, 20(2), 11.
32. Tosterud, R., Hedelin, B., & Hall-Lord, M. L. (2013). Nursing students' perceptions of high- and low-fidelity simulation used as learning methods. Nurse Education in Practice, 13, 262–270.
33. Tutticci, N., Ryan, M., Coyer, F., & Lewis, P. A. (2018). Collaborative facilitation of debrief after high-fidelity simulation and its implications for reflective thinking: Student experiences. Studies in Higher Education, 43(9), 1654–1667.
34. Merrill, E. B. (2015). Guest editorial. Integrating technology into nursing education. Association of Black Nursing Faculty Journal, 26(4), 72–73.
35. Oprescu, F., McAllister, M., Duncan, D., & Jones, C. (2017). Professional development needs of nurse educators. An Australian case study. Nurse Education in Practice, 27, 165–168.
36. Pereira, O. E., & Rodrigues, J. C. (2013). Survey and analysis of current mobile learning applications and technologies.Association for Computing Machinery Computing Surveys, 46(2), 27:1-27:35. doi:10.1145/2543581.2543594
37. Przybyl, H., Androwich, I., & Evans, J. (2015). Using high-fidelity simulation to assess knowledge, skills, and attitudes in nurses performing CRRT … Continuous renal replacement therapy. Nephrology Nursing Journal, 42(2), 135–148.
38. Rajalahti, E., Heinonen, J., & Saranto, K. (2014). Developing nurse educators' computer skills towards proficiency in nursing informatics. Informatics for Health & Social Care, 39(1), 47-66. doi:10.3109/17538157.2013.834344
39. Revell, S.M.H, & McCurry, M.K. (2010). Engaging millennial learners: Effectiveness of personal response system

technology with nursing students in small and large classrooms. Journal of Nursing Education, 49(5), 272–275.

40. Risling, T. (2017). Educating the nurses of 2025: Technology trends of the next decade. Nurse Education in Practice, 89. do:10.1016/j.nepr.2016.12.007i
41. Sanko, J. S. (2017). Simulation as a teaching technology: A brief history of its use in nursing education. Quarterly Review of Distance Education, 18(2), 77-86.
42. Sheikhaboumasoudi, R., Bagheri, M., Hosseini, S. A., Ashouri, E., & Elahi, N. (2018). Improving nursing students' learning outcomes in fundamentals of nursing course through combination of traditional and e-learning methods. Iranian Journal of Nursing & Midwifery Research, 23(3), 217–221.