

LCHS4002 Digital Skills and Research Methods (DSR) (H&Sc)

GROUP 5

Roxana Andrei (Student ID:2234886)

Roxana Marinescu (Student ID: 2233437)

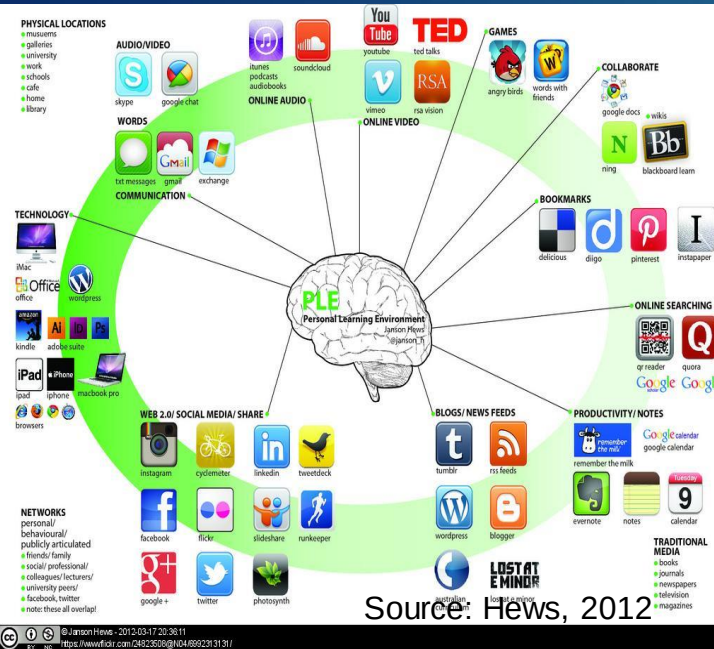
Tabatha C. Nunes Grant (Student ID: 2237880)

Titilayo O. Solanke (Student ID: 2231188)

Voyka T. Nikolaeva (Student ID: 2124306)

Tutor: Samuel Abah

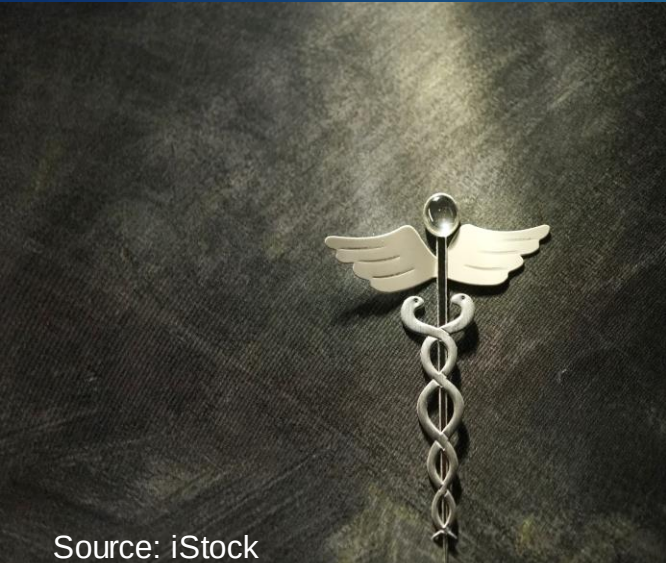
The Use of Digital Tools and Technologies to Improve Efficiency in The Healthcare Sector



1. The use of contemporary technology in healthcare (diagnostic, administrative and care support)
2. The use of technology during the Covid-19 pandemic
3. The use of digital communication, collaboration and participation
4. The use of digital literacy for employee well-being and their professional career development (teaching, e-learning and self-development)
5. The relevance of technical proficiency for data and information handling

1. The contribution of technology in healthcare

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- There are many different technologies used in health and social care sector: artificial intelligence, wearable technologies, mobile applications and websites, clinical data storing and sharing systems that improve the quality of work with patients.
- Virtual reality (VR) and augmented reality (AR) are used effectively for training purposes. They can be very close to realistic situations and useful for staff training. Also, they can help relief pain and anxiety in patients. (O'Regan, 2021)
- Wearable technologies can be connected via Bluetooth to phone devices. These effective items can track our physical activities such as fitness trackers and smart watches.

1. The contribution of technology in healthcare (cont.)



- Mobile applications were used during Covid19 pandemic as a tool for communication, collaboration and participation, they made live conversations, professional meetings and family interactions possible from a distance.
- Apps like 'WhatsApp' were used to make live calls with family and friends during the pandemic. 'Microsoft Teams' gave us the opportunity to work with colleagues and study.
- Websites are a good way to share up to date information in the health and social care field, keeping people updated about the latest news and tools.

1. The contribution of technology in healthcare (cont.)

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- There are official bodies responsible for providing accessible and up to date guidance regulations and legislations. They can give information to the general public but also professional important knowledge needed for people in the working field.
- Many special apps accessible for public are used in the healthcare industry as a tool for providing mental health support, health trackers for monitoring and managing people medical conditions, also access to personal information for their conditions from distance.
- The data and information handling is being managed by technology such as computers and cloud computing system that save personal data of patients, medical conditions and records. Essential information and history that can be accessed by medical personnel.

2. Technology and digital tools during Covid-19 Pandemic



Limit Spread
and Monitor



Self-diagnose
and report



Telemedicine
and treatment



Remote
interactions and
communication



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2. The digital health solution during the Covid-19 Pandemic

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- Increase of digital health tools during the pandemic, each technology played a role in curbing COVID-19 transmission (Alghamdi and Alghamdi, 2022):
 - Telehealth- telephone and video consultation, supporting social distancing
 - Artificial intelligence (AI) - infrared thermal cameras and thermometers to identify infected people
 - Mathematical models and machine learning (ML) - estimate infection numbers and mortality rates, the spread and future infection waves



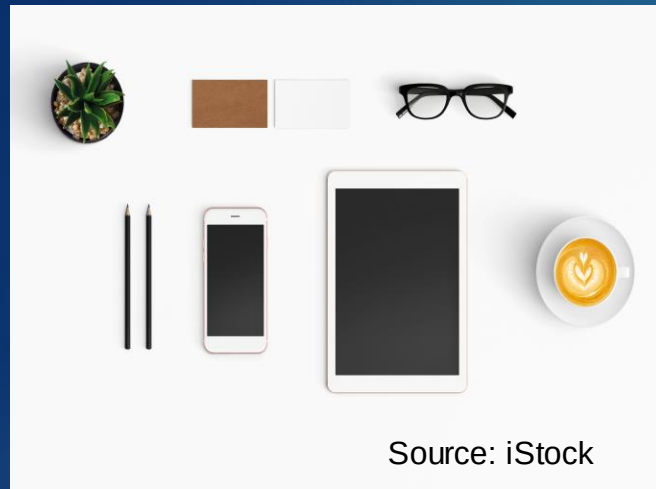
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2. The digital health solution during the Covid-19 Pandemic

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- Digital technology and healthcare innovations – ie: NHS COVID-19 app.
- 3D printing technology (Radfar et al, 2021)
- Wearable biosensors:
 - For early detection of asymptomatic or pre-symptomatic Covid patients, live Covid patient condition, long Covid monitoring
 - Examples: Smart watches, smart tattoos, rings, smart facemasks, nano-patches, etc
 - They are monitoring devices for key physiological parameters, such as body temperature, respiration rate, heart rate, oxygen level. (Khondakar, Kaushik, 2022)

3. Digital tools and technologies to improve efficiency in Healthcare



DIGITAL
COMMUNICATION



DIGITAL
COLLABORATION



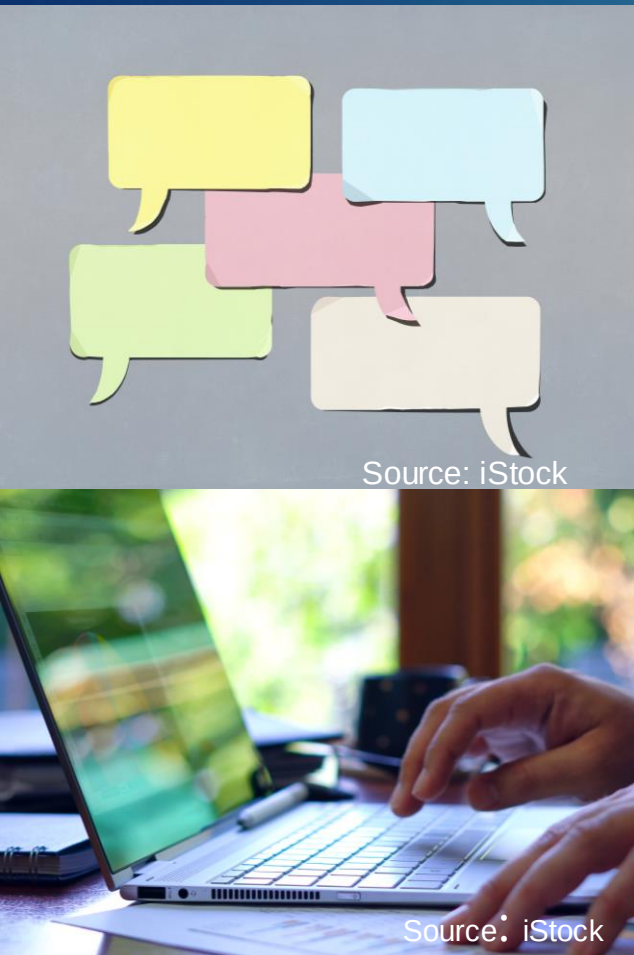
DIGITAL
PARTICIPATION

3a. Digital Communication

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Today's Healthcare workers use digital technology to facilitate communication with other healthcare providers and patients (www.healthmanagement.org, 2020), such as:

- Email, smartphones, (text messaging, apps), Social Media: **Facebook, Tweeter, Instagram**, shared calendars, wearable technologies (www.healthmanagement.org, 2020), (Indeed Editorial Team, 2022)
- Professional networking sites, ie - **LinkedIn** (www.techtarget.com)
- Reminder software: **ReminderCall, GReminders**), (www.g2.com, 2019), (www.healthmanagement.org, 2020)
- Webinars, videos and online platforms: **Google Meet, Microsoft Teams, Zoom, Skype** (Boyarsky, K., 2020),
- Teleconferencing has made it easy to communicate beyond geographic borders. (www.healthmanagement.org, 2020)



3b. Digital Collaboration

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Multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care across settings (WHO, 2010)



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- Apps, software or platforms that help streamline the working process, ie: **FutureNHS** (www.transform.england.NHS.uk)
- Benefits of digital collaboration (Glossop, 2021):
 - Save time and resources
 - Increasing productivity, focus on the most important tasks
 - Improve communication within / between teams and with third parties
 - Make remote working more efficient
 - Simplify work and generate improved results
 - Help to overcome obstacles, generate ideas and solutions

3c. Digital Participation

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Participation of people in the use and design of the internet, digital media and all modern technologies (Bubolz – Lutz, Stiel, 2018)



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- There are three main aspects of digital participation (Bosse, 2016):
 - participation **IN** digital technologies
 - participation **THROUGH** digital technologies
 - participation **WITHIN** the digital world
- Reduced digital participation leads to restrictions in all important areas of life (self-determination, educational/vocational qualifications, social contacts, political and social commitment) (Jaeks, Frieg, Jonas, 2023)

3c. Digital Participation (cont.)

Evaluation of Phase One of the NHS Widening Digital Participation programme (2022):



- Disadvantages of non-participation in the digital health:
- Those who are digitally excluded risk missing out on the benefits of digital health.
 - The health and care system will not save money and transform services unless it engages with one in five of their population who are not online or have digital skills – and are the heaviest users of health and care. (www.digital.nhs.uk, 2022)

4. Digital Literacy for Employee Well-being and their Professional Career Development (Teaching, e-Learning and Self Development)



- What is Digital Literacy. It is referred to an individual's ability to discover, assess, and the transmission of information through typing on various digital platforms.(Dimitropoulou, 2021)
- Digital Literacy is an employee's ability to comfortably and efficiently use the technology required to do their work. (Dom Murray,2022)
- Employees with digital literacy skills are also able to connect and collaborate more effectively.

4. Digital Literacy for Employee Well-being and their Professional Career Development (Teaching, e-Learning and Self Development) cont.



- E-learning means learning that is promoted by technology and can be done remotely.
 - It reduces stress
 - It is done in real time
 - Easily accessible and self-paced
 - Less expensive
 - It leads to self-development, improves personal and professional lives
 - Training

5. Proficiency for data and information handling

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How the data can be used in the hospitals and the relevance of technical proficiency for data and information handling.

Leveraging data from multiple hospitals:

- Enhance specific predictions, faster and more accurate diagnostic for patients
- Compare information to fastest predictions
- Collect data from all hospitals, results in highest performance

(Wiens, Gutttag and Horvitz, 2014)

5. Proficiency for data and information handling (cont.)

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Data feedback efforts improve student learning:

- Using data from the hospitals for student training- can bring real life situations from hospital into students training, preparing them for their future roles
- Performance improvement
- Team working and leadership training

(Bradley, Holmboe, Mattera, Roumani, Radford, Krumholz, 2004)

References

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- *Alghamdi, N. and Alghamdi, S. (2022) The Role of Digital Technology in Curbing COVID-19.* Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9320375/#:~:text=Results%3A%20An%20increasing%20number%20and,in%20curbing%20COVID%2D19%20transmission.> (Accessed: April 6, 2023).
- *Best Appointment Reminder Software* (2019). Available at: <https://www.g2.com/categories/appointment-reminder> (Accessed: April 6, 2023).
- Boyarsky, K. (2020) *The 10 Best Video Meeting Apps.* Available at: <https://resources.owllabs.com/blog/best-meeting-apps> (Accessed: April 6, 2023).
- Dimitropoulou A. (2021) *Why digital literacy is vital in modern workforce.* Available at <https://ceoworld.biz/2021/10/07/>(Accessed:12th April 2023).
- Dom Murray (2022) *The importance of digital literacy for your workforce.* Available at <https://www.go4.com/blog/post> (Accessed:30th March 2023).
- E H Bradley¹, E S Holmboe², J A Mattera³, S A Roumanis³, M J Radford^{4,5}, H M Krumholz^{1,3,5}, 2004. *bmj journals.* [Online] Available at: <https://qualitysafety.bmj.com/content/13/1/26.info> (Accessed 29 03 2023)
- *FutureNHS collaboration platform* (2022). Available at: <https://transform.england.nhs.uk/key-tools-and-info/digital-playbooks/open-source-digital-playbook/future-nhs-collaboration-platform/> (Accessed: April 7, 2023).
- Glossop, A. (2021) *5 benefits of online collaboration tools.* Available at: <https://www.ideagen.com/thought-leadership/blog/5-benefits-of-online-collaboration-tools> (Accessed: April 6, 2023).
- Indeed Editorial Team (2022) *16 Communication Technology Examples To Use at Work.* Available at: <https://www.indeed.com/career-advice/career-development/communication-technology-examples> (Accessed: April 11, 2023).
- *Interprofessional Collaborative Practice* (no date). Available at: <https://www.whpa.org/activities/interprofessional-collaborative-practice#:~:text=According%20to%20WHO%3A%20%22Collaborative%20practice,across%20settings%5B1%5D.%22> (Accessed: April 6, 2023).
- Jaecks, P., Frieg, H., Jonas, K., Bielefeld University, University of Applied Sciences and Arts, Hildesheim, Germany, and University of Cologne, Germany (2023) *Digital Participation and Communication Disorders across the Lifespan.* Available at: <https://www.frontiersin.org/research-topics/43134/digital-participation-and-communication-disorders-across-the-lifespan#:~:text=There%20are%20three%20main%20aspects,participation%20WITHIN%20the%20digital%20world%2C> (Accessed: April 11, 2023).

- Jenna Wiens, John Gutttag, Eric Horvitz, 2014. A study in transfer learning: leveraging data from multiple hospitals to enhance hospital-specific predictions. *Journal of the American Medical Informatics Association* , 21(4).
- Khondakar, K. and Kaushik, A. (2022) *Role of Wearable Sensing Technology to Manage Long COVID* . Available at: <https://www.mdpi.com/2079-6374/13/1/62> (Accessed: April 14, 2023).
- NHS (2022) *Why digital inclusion matters to health and social care*. Available at: <https://digital.nhs.uk/about-nhs-digital/corporate-information-and-documents/digital-inclusion/digital-inclusion-in-health-and-social-care> (Accessed: April 11, 2023).
- O'Regan , V. (2021) '*Technology in Health and Social Care*' , 1 November [Online] Available at: [Technology in Health and Social Care | Types & Benefits](https://highspeedtraining.co.uk/technology-in-health-and-social-care/types-and-benefits) (highspeedtraining.co.uk) (Accessed: 2 April 2023)
- Radfar, P. et al. (2021) *The role of 3D printing in the fight against COVID-19 outbreak*. Available at: [https://www.futuremedicine.com/doi/10.2217/3dp-2020-0028#:~:text=People%20with%20access%20to%203D,Figure%201\)%20%5B17%5D](https://www.futuremedicine.com/doi/10.2217/3dp-2020-0028#:~:text=People%20with%20access%20to%203D,Figure%201)%20%5B17%5D). (Accessed: April 12, 2023).
- Scribbr (No data) Scribbr Harvard Referencing Generator Available at: [Free Harvard Referencing Generator | Verified by Experts | Scribbr](https://www.scribbr.com/harvard-referencing-generator/) (Accessed: 5 April 2023)
- Smith , C. (2019) '*What is wearable tech? Everything you need to know explained*' 17 August [Online] Available at: [What is wearable tech? Everything you need to know explained – Wearable](https://www.wearable.com/what-is-wearable-tech-everything-you-need-to-know-explained/) (Accessed: 5 April 2023)
- Terrell Hanna, K. (2022) *What is LinkedIn?* Available at: <https://www.techtarget.com/whatis/definition/LinkedIn> (Accessed: April 6, 2023).
- *The Impact of Digital Technology on Healthcare* (2020). Available at: <https://healthmanagement.org/c/cardio/news/the-impact-of-digital-technology-on-healthcare#:~:text=Improved%20Lines%20of%20Communication%3A%20There,%2C%20smartphones%2C%20text%20messaging%20etc.> (Accessed: April 7, 2023).
- World Health Organization. (2010) *Framework for action on interprofessional education and collaborative practice*. Geneva, Switzerland: WHO