MD3B4-15 Digital technology & Health

22/23

Department
> Warwick Medical School

Level
> Undergraduate Level 3

Module leader
> Frances Griffiths

Credit value
> 15

Module duration
> 9 weeks

Assessment
> 100% coursework

Study location
> University of Warwick main campus, Coventry

Description

Introductory description

During this module, students are introduced to the varied uses of technologies in health and care settings. Furthermore, challenges associated with big data and artificial intelligence will be explored as well as their benefits for managing local and global health problems.

[Module web page](#)

Module aims

An in-depth understanding of the barriers and challenges associated with digital innovation in health and care settings.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

During this module students will be introduced to the potential benefits and barriers of using digital technologies in problem solving for health. The technologies covered will vary from year to year according to contemporary developments. This module will explore the digital landscape in healthcare including digital wearables, communication, and health records, how these are

changing and implications for health inequalities. During this module students will engage with concepts of big data, analytic algorithms, and emerging digital technologies. They will cover the challenges of big data, such as data structure, security, data standardisation, storage and transfers, and data governance. Students will explore how artificial intelligence is being developed and applied in health care and consider issues of bias and impact on the healthcare workforce. The application of several technologies in various health disciplines will also be discussed. For example, students could focus on use of sensors for health and care monitoring, artificial intelligence used in triage and diagnostics, or the potential use of extended reality.

Learning outcomes

By the end of the module, students should be able to:

- To critically review the current digital landscape in health and care locally and globally and analyse impact on inequalities and access
- To demonstrate a deep understanding of concepts of big data, analytic algorithms and other emerging digital technology/analytics and their application in health
- To assess and critique the use of artificial intelligence in health and care with use of an example
- To formulate recommendations for application of emerging digital technologies in relation to local and global health problems as well as their potential consequences/challenges/ limitations

Indicative reading list

1. World Health Organisation. Classification of digital health interventions v1.0. A shared language to describe the uses of digital technology for health: World Health Organisation, 2018.
2. Ajana B. Personal metrics: Users' experiences and perceptions of self-tracking practices and data. Social Science Information. 2020;59(4):654-678. doi:10.1177/0539018420959522
3. Griffiths F, Watkins JA, Huxley C, Harris B, Cave J, Pemba S, et al. Mobile consulting (mConsulting) and its potential for providing access to quality healthcare for populations living in low-resource settings of low- and middle-income countries. DIGITAL HEALTH. 2020;6:2055207620919594.
4. Griffiths F, Bryce C, Cave J, Dritsaki M, Fraser J, Hamilton K, et al. Timely digital patient-clinician communication in specialist clinical services for young people: a mixed-methods study (the LYNC study). Journal of Medical Internet Research. 2017;19(4).
5. Panesar, A., 2019. Machine learning and AI for healthcare (pp. 1-73). Coventry, UK: Apress. Chapters 1, 2 and 3
6. Ellis TD, Earhart GM. Digital Therapeutics in Parkinson's Disease: Practical Applications and Future Potential. Journal of Parkinson's Disease. 2021;Preprint:1-7.
7. Singh H and Sittig D.F. (2016) Measuring and improving patient safety through health information technology: The Health IT Safety Framework. BMJ. 25(4): 226-232.
8. Wachter R. (2015) The Digital Doctor: Hope, Hype and Harm at the Dawn of Medicine's Computer Age. McGraw-Hill Education.
9. Draper H., Sorell T. (2013) Telecare, remote monitoring and care. Bioethics. 27(7): 365-372

Subject specific skills

Knowledge and understanding of the concepts of big data, analytic algorithms and other emerging digital technology/analytics and their interaction with digital health.

Transferable skills

The transferable skills gained from the completion of this module include ability to gather and interpret information, ability to analyse data including analysis that informs understanding of inequalities, oral communication skills, ability to make decisions and solve problems, written communication skills, ability to learn quickly, and creative/innovative thinking.

Study

Study time

Type	Required
Lectures	10 sessions of 1 hour (7%)
Seminars	5 sessions of 1 hour (3%)
Practical classes	6 sessions of 1 hour (4%)
Other activity	9 hours (6%)
Private study	75 hours (50%)
Assessment	45 hours (30%)
Total	150 hours

Private study description

Students would be expected to engage in 120 hours of self-directed learning (45 hours for assessments) outside other learning and teaching activities outlined above.

Other activity description

Technology-enhanced learning, including the use of online interactive presentations and videos, quizzes (9 hours)

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A1

	Weighting	**Study time**
Written blog with hyperlinks	60%	27 hours

Formative assessment mid-module: review of topics for blog to ensure diversity of topics across class; formative practice of how to write blog and the choice and use of material to include on hyperlinks to enhance blog (e.g., videos that demonstrate your chosen digital health technology, links to sources of evidence, embedded videos of user experience, links to related policy or projections about the use of the digital health); in-class peer review.

Summative assessment: Individual blog with hyperlinks (750 words, 3-5 hyperlinks and up to 10 references): students will choose a digital health technology that uses data and analytics (approved by module lead mid-module); they will write for a scientific audience such as health professionals working with the chosen digital technology. The blog will detail how the digital health technology works, where, when and for whom it is or could be deployed and its health benefits. The text should both describe and evaluate the technology, critique claims made for the technology and make recommendations for its use.

Infographic	40%	18 hours

Formative assessment mid module: review of chosen AI applications to ensure diversity of applications across class; formative practice; in-class peer-review.

Summative assessment: Infographic about a specific health technology that uses artificial intelligence (AI). Infographic to include up to 12 images each with 1-2 sentences of text written. Audience for infographic is health professionals early in their career; infographic designed to be used in their continuing professional development. The infographic will describe and critique how the AI driven technology works including source of training data used in development and data used for learning algorithms. It will consider implications of use in terms of inequalities and access, data ethics and health service change.

Feedback on assessment

The blog and infographic will be marked using standardised rubrics. Feedback to the students (including individualised feedback) in line with WMS assessment criteria will be given to thestudents. Further verbal feedback will be available to students on request.

Availability

Courses

This module is Core for:

- UMDA-B990 Undergraduate Health and Medical Sciences

- Year 3 of B990 Health and Medical Sciences
  - Year 3 of B990 Health and Medical Sciences
- Year 3 of UMDA-B992 Undergraduate Health and Medical Sciences (with Summer Term Study Abroad)