

Irish National Digital Experience (INDEX) Survey

Appendix A. Student Digital Activities

This Appendix contains a thematic analysis of responses to INDEX Student Survey Question 17a: *“Please give an example of a digital activity you have found really useful on your course”*.

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Introduction

The [INDEX Survey Findings Report](#), published in May 2020, is based on an analysis of responses to all questions on the INDEX surveys for students and staff who teach. Further analysis has since been completed on the free text responses for selected survey questions. The thematic analysis presented here is an extension of the initial analysis for Student Survey Q17a presented in the INDEX Survey Findings Report, Table 8 (page 35). The initial qualitative analysis for this question presented in the report was based on a random sample of 10% of the total data set. The thematic analysis for Q17a described in this Appendix is based on the entire data set. The analysis is presented in two sections:

- Section 1 presents a thematic analysis of free text responses to Q17a of the INDEX Student Survey and a discussion of these results
- Section 2 provides a detailed description of the data cleaning and analysis approach

The [INDEX Student Survey](#) included two free text questions related to the use of digital tools and digital activities: Q12a. *“Please give an example of a digital tool or app you find really useful for learning”* and Q17a. *“Please give an example of a digital activity you have found really useful on your course”*. Many students provided similar answers to these questions. However, more elaboration was seen in the responses to Q17a, including descriptions of how and in what contexts specific digital tools were used. This richer data set for Q17a was selected for further analysis and is the focus of this Appendix.

Section 1

Thematic analysis

Overview

Results of the thematic analysis of free text responses to Q17a of the INDEX Student Survey are summarised here and in the tables in this section.

Survey responses: Of the 25,485 students who responded to the INDEX Survey, approximately half (12,857) responded to Question 17a. After a thorough process of data cleaning (described in section 2 and shown in Figure A1 below), 7,516 responses were included in the analysis, representing 58% of all responses to this question and 29% of all student responses to the survey.

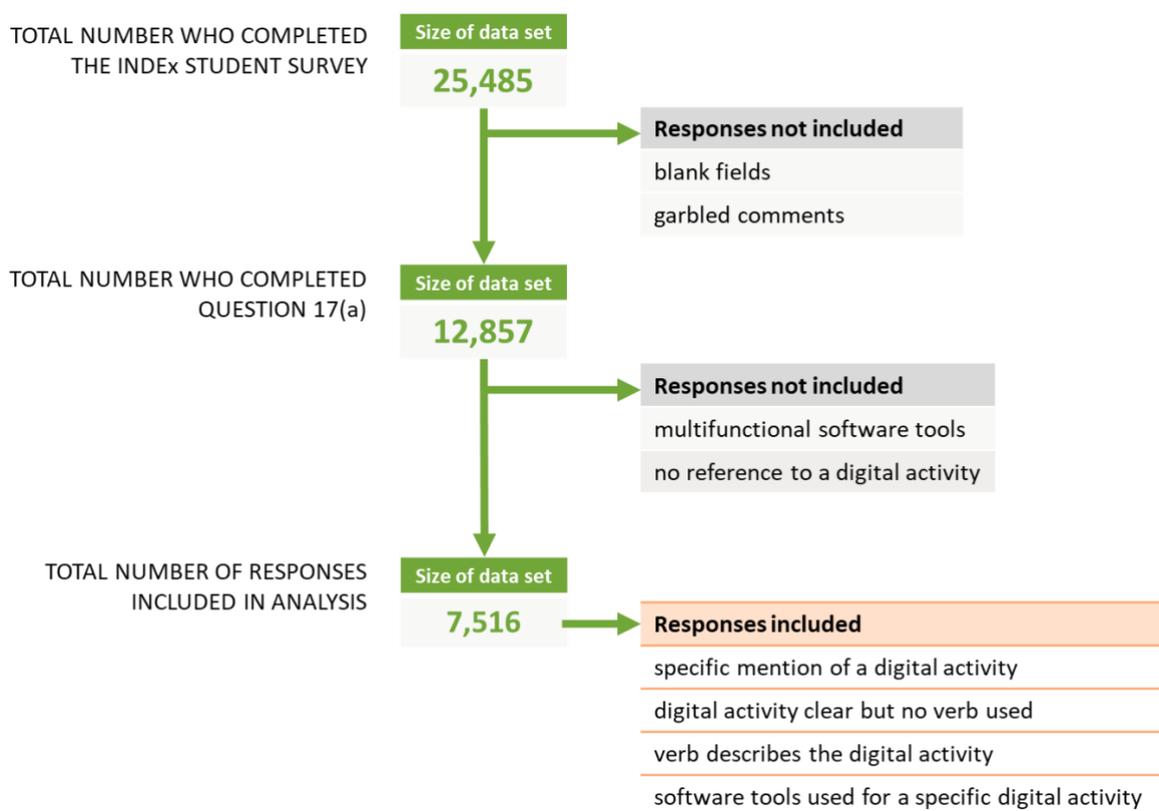


Figure A1. Overview for the process of cleaning responses to INDEX Student Survey Q17a “Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

High-level themes: A diverse range of digital activities was identified by students as “really useful” on their course. Following detailed analysis of all responses (in the cleaned data set), ten high-level themes were identified in order of frequency (highest to lowest):

- Polling and quizzing
- Accessing the VLE
- Accessing learning material
- Using discipline-specific software
- Communicating and collaborating
- Creating content
- Researching
- Using core programmes
- Making notes
- Organising time and resources

Each of these ten themes encompasses one or more sub-themes (digital activities) as well as associated tools and/or resources.

Indicative quotes: Although most respondents listed one or more digital activities, some used the space provided to provide further contextual information. Thus, for each of the themes identified in the table below, indicative respondent quotes (where available) are included.

‘None’ theme: In addition to describing specific digital activities, several students (5% of question respondents in the cleaned dataset) indicated in their responses to Q17a that they did not engage in useful digital activities on their course, for a variety of reasons. For this reason, ‘None’ has been added as an additional theme.

All themes are outlined in the table below, together with sub-themes, associated tools/resources, and indicative quotes from student respondents to shed further light on the digital activities mentioned.

Thematic analysis and discussion

The thematic analysis presented over the next few pages in Tables A1-11 are based on 7,516 responses, in order of frequency of the themes.

Polling/quizzing

Polling and quizzing was most frequently referred to by students as a digital activity which was really useful on their course. The ways in which polling and/or quizzing was conducted can be summarised by the subthemes where students: answer/complete/submit responses to surveys; ask questions; complete/do test/MCQ/quizzes; complete attendance polls; create polls/quizzes, and interact/participate in poll/polling. Students engaged in polling and/or quizzing either instigated by themselves for revision or facilitated by the staff who teach them for engagement or assessment purposes. In explaining why polling/quizzing was useful, some students said that it was a great way to keep them motivated and engaged in the lesson by giving them an opportunity to assess their own knowledge and get real time feedback as to their understanding. Where polling was used anonymously, some students said that it gave them confidence to be able to answer in class.

Table A1. Detail of the ‘Polling/quizzing’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Polling/quizzing (21%)	Answer/complete/submit responses to surveys Ask questions Complete/do test/MCQ/quizzes Complete attendance polls Create poll/quizzes Interact/participate in poll/polling	Canva, Classmarker, Classroom, Clicker, Clickers, Kahoot!, Kubicle, Logger Pro, McGraw-Hill, Mentimeter, Padlet, Poll Everywhere, Quizlet, Qwickly, Responseware, Slido, Socrative, Survey123, Surveymonkey, TurningPoint, VLE	<i>[Our] lecturer [Name] uses Kahoot on Thursdays to quiz us;</i> <i>The knowledge checks at the end of each session;</i> <i>Training tests before online tests;</i> <i>Using clicker devices during lectures to answer MCQ's;</i> <i>Sample MCQs on Blackboard;</i> <i>We do a lot of online, ungraded quizzes on my course; and then discuss them on a forum;</i> <i>Quizlet provides exercise questions of specific chapters for students to prepare for the exams;</i> <i>Using polls to become more involved and vocal in class with questions or answering;</i> <i>Using Mentimeter to do quizzes just before a lecture ends to clarify points, which a reasonable portion of the lecture [class] may have misunderstood, in a short time.</i>

Accessing the VLE

The second most frequently mentioned useful digital activities themes were accessing the VLE and accessing learning material. Sub-themes describing the many specific digital activities involved in this mention accessing the VLE for: lecture notes/slides, past-paper questions, module information/timetable/submission dates, lecture recordings/screencasts, grades, back-up/store work, assignments/tutorials, blended learning/flipped classroom/e-course, reading list/links, feedback, portfolio/blog, discussion boards/forums, virtual classrooms/e-lectures/live lectures. Many students recognised the usefulness of the activities to keep up to date with their work, but specifically mention that the sharing of the resources using the VLE should be consistent and timely. Whilst many say this is useful for revision, some students also said it was necessary for distance and part-time learning and in cases where a student was absent due to being on placement or due to illness. In some cases students mention the advantages of notes and assignments in digital forms as they are easier to archive, search, submit and do not require stationary. This also saves time and money. As one respondent explains with digital assignment submission there is ‘no need to purchase stationary which is quite costly in comparison to my home country’.

Table A2. Detail of the ‘Accessing the VLE’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Accessing the VLE (14%)	Access/download/get/print/review lecture notes/slides Access/download/print past-paper questions Access/check/find module information/timetable/submission dates Access/listen to/watch lecture recordings/screencasts Access/check/get grades Back-up/store work	VLE (Blackboard, Brightspace, Canvas, Moodle, Loop, SULIS)	<i>Accessing [VLE] for module information, submission dates;</i> <i>Slides and learning materials;</i> <i>Journal entries on [VLE];</i> <i>Lectures being uploaded online for easy access when revising;</i> <i>Referring to continuous assessment briefs on [VLE] in the event of hard copy loss;</i> <i>Recorded lectures that are available online gives part time students the best opportunity to succeed. I’ve found them very helpful;</i> <i>Uploading assignments online without having to produce a hard copy;</i>

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	<p>Complete/manage/submit/upload assignments/tutorials</p> <p>Engage in blended learning/flipped classroom/e-course</p> <p>Find reading list/links</p> <p>Get/give feedback</p> <p>Submit/log evidence for a portfolio/blog</p> <p>Take part in/post in discussion boards/forums</p> <p>Take part in virtual classrooms/e-lectures/live lectures</p>	<p><i>As I was unwell in hospital but was able to stay on top of my studies because of [VLE] I am now catching up to the work but can't recommend it enough;</i></p> <p><i>[VLE] is very useful for viewing lecturer videos, downloading notes, asking questions, etc.;</i></p> <p><i>Activities on [VLE] related to the current lecture topic. Normally when I get the chance to put what I have learnt in a college related task it is for an essay or exam. Being able to do it with an activity is great because I see where my learning level is without the stress of a final grade;</i></p> <p><i>The VLE discussion section - an excellent way for online students to interact and get feedback;</i></p> <p><i>Recording the interviews and uploading it on the [VLE] directly without transcribing it;</i></p> <p><i>Webinar style lectures and related recordings - these allow me either access lectures remotely, and/or play them back at a more convenient time for my work-life demands.</i></p>
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Accessing learning material

The subthemes describing the specific digital activities involved in accessing learning material describe those outside of the VLE, with the use of online learning websites or other sources of online information, training support, online classes/courses/workshops, podcasts, educational games/use flashcards/apps, interactive e-book/smartbooks, and educational videos. Most specific comments reflected that these activities were self-directed by students who were trying to find more information online to supplement that provided by their lecturers, or they were watching educational videos on YouTube to help them understand key concepts covered in class.

Table A3. Detail of the ‘Accessing learning material’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Accessing learning material (14%)	Access/use online learning websites Find more information online Find training support Join online classes/courses/workshops Learn how to... Listen to podcasts Play educational games/use flashcards/apps to memorise/practice Read/use an interactive e-book/smartbook Use classes/tutorials to learn how to... View/watch educational videos	EdX, Google Books, Google Earth, Google Search, Khan Academy, LearnSmarts, Library, McGraw-Hill, Mubi, Netflix, TED, TV Paint, Udemy, VLE, W3Schools, Webinar, Wiki, YouTube	<i>Ability to view images of different paintings that are in galleries abroad;</i> <i>Searching online video tutorials to supplement lecture material and catch up on missed lectures;</i> <i>Using videos for learning;</i> <i>Accessing data bases provided by the digital library;</i> <i>Anatomy applications and websites, online knowledge resource;</i> <i>Had to complete a Khan Academy course set out by lecturer. An interesting and easy way of learning...;</i> <i>Finding supplementary course material online’</i> <i>Using WeBWork to do online maths problems;</i> <i>Game simulations which showed us scenarios relating to resource distribution, was much more understandable than discussing the concept in a broader term;</i> <i>Games to help understand key concepts.</i>

Using discipline-specific software

Using discipline-specific software was the third most frequently mentioned theme describing useful digital activities. When students mentioned specific activities (sub-themes) using discipline specific software these were to build/create/design/draw (models), use analytical tools, programming applications to code/develop/simulate or use a simulator to apply knowledge. These activities crossed numerous disciplines, from health and life sciences, engineering and physical sciences, natural sciences, social sciences, business and management, and computer science. Most tools mentioned in this category were those used in the future workplaces of the students.

Table A4. Detail of the ‘Using discipline-specific software’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Using discipline-specific software (11%)	Build/create/design/draw (models) Using analytical tools Using computer programming applications to code/develop/simulate Use a simulator to apply knowledge	ArcGIS, ArcMap, AutoCAD, Autodesk, Audodesk 3ds Max, Belbin, Biovia, BIM, BLS Simulations, CAD, ChemDraw, Circuit Simulation, Codeacademy, Codeblocks, Codesandbox, Dartfish, DaVinci, Resolve, Duolingo, Eclipse, Eviews, Falstad circuit simulator, Geany, GIS, GitHub, GraphPad, GX, Works, Hotpots, Hotts, HSELand, HubSpot, IBM SPSS, Java, JUnit 5, Jupyter, Leica Airlab, Mastering Biology, MathsLab, MATLAB, Minitab,	<i>Test driven software development using Eclipse and JUnit;</i> <i>Programming with Python or Excel and use Minitab to analyse measurement data;</i> <i>Falstad circuit sim;</i> <i>MATLAB (Octave) and associated site MathWorks;</i> <i>Dartfish for performance analysis;</i> <i>The use of Mule for computer science helps us improve our coding abilities;</i> <i>Kaggle for practicing machine learning;</i> <i>Online anatomy videos and quizzes, online radiology;</i> <i>Running simulations in ANSYS or MATLAB/Assignment series based on videos of experiments and links to data;</i> <i>SoundGym.com is an ear training website which offers multiple fun games to train your ears for music and the studio;</i> <i>Using (vulnerable) virtual machines to investigate and practice penetration testing, both online and downloading to the pc;</i>

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		<p>Mule, NetAnatomy, OxCal, p5, Packet, Packet Tracer, Power World, Proteus, PSpice, Python, R, R Markdown, R Studio, RedCap, Repl.it, Revit, Rosetta Stone, Rstudio, Scrum, SedLog, SEED Labs, Sibelius, SimuText, SolidWorks, SoloLearn, SPSS, STATA, Tableau, Terminal, Vectorworks, WebGoat, Webwork, websites</p>	<p><i>Creating molecules/mechanisms with Biovia (Chemical Formulation Tool);</i></p> <p><i>Model-making in software like 3ds max;</i></p> <p><i>The use of SolidWorks or MATLAB helped with concept design and modelling;</i></p> <p><i>We use ArcMap and ArcGIS in a mapping tutorial in Geography to understand the method of making a map;</i></p> <p><i>Applying the principles learned on the course, every week we practise using software programs for extracting insights from data for real-world business or medical scenarios.</i></p>
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Communicating and collaborating

When students mentioned specific activities as part of the fourth most frequent high-level theme, communicating and collaborating, they referred to ideas/updates, documents, assignments/projects, email messages, discussion forums, social media and blog posts. Many of these centred on learning from each other outside of class and working together on group assignments. Cloud storage-based Google Docs, Google Slides and online MS Word and PowerPoint through Office 365 were tools identified by students which were useful for collaborating on an assignment.

Table A5. Detail of the ‘Communicating and collaborating’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Communicating and collaborating (10%)	Access/share ideas/updates	Adobe Classroom, Adobe Connect, Collaborate Ultra, Class Dojo, Classflow, Email, Facebook, Google Classroom, Google Colab, Google Docs, Google Drive, Google Forms, Google Hangout, Google Slides, Google Team Drive, GitHub, Hangouts, MS OneDrive, MS Outlook, MS PowerPoint, MS Project, MS Sharepoint, MS Teams, MS Word, Padlet, PeerWise, Screencast, Slack, Skype, SpeakUp, Tello, Tumblr, Twitter, VLE, WhatsApp, Zoom	<i>Emailing several teachers and students to keep lines of communication open;</i>
	Compare/review/share documents		<i>Discussing Renaissance paintings on [VLE];</i>
	Communicate/coordinate/facilitate group activities		<i>The Taxation Group assignment requires students from Ireland and the US to work together - students need to record progress on the blackboard & communicate with each other via apps like WhatsApp or Skype;</i>
	Create/collaborate/do/merge/work on assignments/projects		<i>Using Google Docs to communicate during group projects;</i>
	Send/receive email messages		<i>Sharing information and discussing with other students;</i>
	Use discussion forums		<i>Programming exercises with Google Collab;</i>
	Use social media		<i>The use of GitHub to work with fellow students in my group;</i>
	Read blog posts		<i>The study rooms with projectors around campus for group meetings.</i>
Talk online			

Creating content

The fifth most frequently mentioned high level theme, creating content referred to sub-themes such as animations, surveys, audio, video, images, mind maps, infographics/posters/leaflets, blogs, documents, presentations, portfolio or reflections, games, websites, and flashcards. Whilst most of the tools mentioned in this theme could be attributed to artistic and design-based disciplines, they are also used more widely as alternative software for creating content across a wide range of disciplines either through preference or for accessibility reasons. For example, one respondent who is ‘someone with motor skills issues [uses] Illustrator instead of hand drawing things [as it] is very useful’.

Table A6. Detail of the ‘Creating content’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Creating content (9%)	Animate/make animations	Adobe, Adobe Illustrator, Adobe Photoshop, Book creator, Camtasia, Canva, DaVinci Resolve, Draw.io, Dreamweaver, Genially, Illustrator, InDesign, LaTeX, Lightroom, Lightworks, MS Sway, Powtoon, Panopto, Pebbledash, Photoshop, Photostory, Piktochart, Premiere Pro, Prezi, SketchUp, Unity, Visio, Visme, Visual Studio, Voicethread, Wavepad, Xmind.	<i>Adobe Creative Cloud products like Photoshop, InDesign help me lay out my work professionally;</i>
	Build/design survey		<i>As creative students we use InDesign to build and design presentations and we use illustrator to create PDFs of creative work;</i>
	Create/record/edit audio		<i>Creating infographic on Piktochart;</i>
	Create/record/edit/make video		<i>Making a patient resource website;</i>
	Create/design/draw images		<i>News editing and writing on mobile;</i>
	Create/design/draw mind maps		<i>Creating a website based on what we had learned about a specific topic;</i>
	Create/design/make infographics/posters/leaflets		<i>We made a video on Powtoon as a resource for physiotherapists to use when treating children with disabilities;</i>
	Create blogs		<i>Video recording of ourselves for clinical consultations;</i>
	Create/design/produce/write documents		<i>One assignment asked us to create our own ICT resources to teach number facts to 4th class students. We learned not only how to integrate ICT but make it a main subject to learn by allowing the students to independently use it to learn other subjects.</i>
	Create/design presentations		
	Create/curate/keep portfolio/digital record or reflections		<i>Using Canva to create visual presentations and posters;</i>

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	Create/design websites Make flashcards		<i>Using Xmind to design mind maps helped me visualise my notes on certain articles/journal papers; Having an online portfolio to update with work from each week, it helps me to stay on top of things and is a good resource to have when I want to look back on what I have done.</i>
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Researching

Under the sixth most frequent high level theme, researching, specific useful digital activities mentioned were citing references or using reference management software, reading research papers/journals, searching for cases/literature/journals/research and writing a research paper/literature review/essay. This was largely mentioned by postgraduate students and undergraduate students who study law to give them contextual relevance for the cases they study.

Table A7. Detail of the ‘Researching’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Researching (8%)	Citing references/Using reference management software Reading research papers/journals Searching for cases/literature/journals/research Writing a research paper/literature review/essay	Endnote, Google, Google Books, Google Scholar, JSTOR, Library, Mendeley, MS PowerPoint, ProQuest OneSearch, ResearchGate, Web of Knowledge, WebQuest, Westlaw, Zotero	<i>Reference guides such as Mendeley and learning to use scientific search tools for bioinformatics;</i> <i>As I am in computing, I use the internet a lot to search for problems with code or solutions etc; finding articles on JSTOR;</i> <i>Mainly collecting sources; being able to find books and journals in the online library;</i> <i>Installing a reference manager so I can keep track of references/journal articles;</i> <i>Use of Zotero to share readings and organise bibliographies.</i>

Using core programmes

Using core programmes was the seventh most frequently mentioned high level theme. In it a variety of digital activities are mentioned which describe tasks undertaken by students usually for assignments, which involve analysing data, creating/giving/making presentations, making graphs/graphing, using spreadsheets, or writing assignments/essays/reports. Some of those who mentioned creating presentations using MS PowerPoint, also mentioned the use of advanced skills within the application, such as embedding videos, timing slides, narrating, or exporting the presentation as a video clip. In this way, students said they were able to prepare presentations to support alternative assessment methods ‘using PowerPoint, [where] you can record your voice so that you don't have to stand up and do a presentation in class’.

Table A8. Detail of the ‘Using core programmes’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Using core programmes (5%)	Analysing data Creating/giving/making presentations Making graphs/graphing Using spreadsheets Writing assignments/essays/reports	Google Docs, MS Access, MS Excel, MS Forms, MS Office 365, MS PowerPoint, MS Word	<i>Word and PowerPoint are essential;</i> <i>Using Excel, Word, etc. to model what we've studied/learned in the lab and field;</i> <i>Writing essays using Microsoft Word;</i> <i>Creating Gantt charts using Excel; creating presentations on PowerPoint;</i> <i>The college allows us to download the Microsoft Office package as students on a number of devices to allow us to do work. We also have a huge amount of store available up on our student one drive.</i>

Making notes

The eighth most frequently mentioned high level themes are making notes and organising time and resources. Both of these high level themes are instigated by the students to support their own learning. Those who mentioned the high level theme, making notes, referred to the creation of digital notes or voice notes as represented by the sub-themes.

Table A9. Detail of the ‘Making notes’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Making notes (1%)	Creating/making/taking/typing/writing notes Recording voice notes/memos	Apple Pencil, desktop, Google Docs, Evernote, iPad, laptop, MS OneNote, MS Office 365, MS PowerPoint, MS Word, tablet, phone, Voice Memos	<i>Studying by adding links to useful videos to a page on OneNote as well as taking digital notes and adding pictures;</i> <i>Summarising course book into simple understandable bullet points on Word;</i> <i>Notes on Evernote has been a digital activity that has helped me to create records of what I learn in class.</i>

Organising time and resources

The high level theme, organising time and resources includes subthemes were students back-up/store work, manage time/plan or print and scan. The use of cloud storage solutions appeared in this category as a way for students to easily access notes or assignments on a range of devices inside and outside of their institution. In terms of the sub-theme ‘manage time/plan’, making to-do lists or project planning techniques such as creating Gantt charts featured.

Table A10. Detail of the ‘Organising time and resources’ theme coded from free text responses to INDEX Student Survey Q17a (“Please give an example of a digital activity you have found really useful on your course”). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
Organising time and resources (1%)	Back-up/store work Managing time/planning Print/Scan	Google Drive, Dropbox, iCloud, MS Excel, MS Office 365, MS OneDrive, MS To-Do, Printer, Scanner, To-doist	<i>Saving everything and doing essays and presentations using Google Drive;</i> <i>I use Microsoft To-Do to keep track of things I have to do including Assignments and their due dates;</i> <i>Scanning, labelling and storing written notes on Google Drive.</i>

None

The 'None' category was created to ensure the analysis included those who responded that there were no digital activities they found really useful on their course. It is especially important to include the responses of those who don't engage with digital due to the digital nature of the INDEX Survey itself, which may have gained more responses from people who use digital technologies more often. We really wanted to listen to those who say they engage in no useful digital activity. The few indicative comments are important as they help to identify where there is room for improvement. Where students explained why there were no useful digital activities, many comments reflected that digital activities were not relevant to their course or discipline, that their institutions chose not to update their practice of turning in paper assignments or lab reports, or that in their opinion digital activities were not useful. This is however at odds with the many examples of useful digital activities given from those studying in the humanities disciplines. Some students touched on two main interrelated reasons why they were not engaging with technology and why they could not identify a useful digital activity on their course: students needed more confidence using digital technologies and more support to do so. In 2017, UNESCO¹ identified that a range of digital skills is required to make meaningful use of technology. If students do not have support to develop digital skills it is unsurprising that they cannot identify useful digital activities on their course and why these digital disenfranchised responses are seen in the 'None' theme.

Table A11. Detail of the 'None' theme coded from free text responses to INDEX Student Survey Q17a ("Please give an example of a digital activity you have found really useful on your course"). Response data was included based on the data cleaning criteria outlined in section 2.

Theme	Sub-theme (digital activities)	Associated tools	Indicative quotes
None (5%)			<p><i>None;</i></p> <p><i>We don't do any;</i></p> <p><i>There are none at the moment except thesis workshop;</i></p> <p><i>Nothing is digital, lecturers are asking us to print off assignments even though they have digital copies in their emails or [VLE], I found it very odd;</i></p> <p><i>Unfortunately, no digital activities are ever done; lab reports are still hand-written and no skills like Excel are taught;</i></p> <p><i>I find the system very difficult to navigate, therefore I avoid digital activity as much as possible.</i></p>

¹ UNESCO. (2017). Digital skills for life and work. Paris: UNESCO Publishing.

Concluding comments

The high-level themes used in the analysis here to identify the *types* of useful digital activities also provide us with the opportunity to look at the *purposes* of these activities. In this way we get a very student-centred perspective of the activities.

INDEX Staff Survey. The INDEX Staff Survey included one question related to the analysis in this Appendix: Q17a: “Please give an example of a digital tool or app you find really useful in your job role”. The initial qualitative analysis for this question is contained in the [INDEX Survey Findings Report](#), Figure 5 (pp. 36). More detailed analysis was conducted for Q17a; this analysis can be found in INDEX Appendix B. Staff Digital Tools. Comparing the INDEX student and staff results:

- The top² three areas of digital activity identified by staff who teach were creating/editing/sharing digital content, polling/quizzing, and using the VLE. These are similar to the top³ three digital activities identified by students, i.e., polling/quizzing, accessing the VLE, and accessing learning material.
- ‘Communicating and collaborating’ were identified by both students and staff who teach in their top five most useful digital activities.
- Both students and staff who teach identified ‘using discipline-specific’ tools and software as useful, with somewhat more emphasis on this by staff than students.
- Other digital activities identified by students and staff were similar also, but with different emphases based on different areas of focus by students (on learning) and staff (on teaching and supporting teaching and learning).

Overall, the qualitative analysis shown here paints a picture of varied digital activities which students said they found really useful on their course.

² “Top” here describes the areas identified most frequently by staff respondents when asked to give examples of a digital tool/app they find “really useful for your job role”.

³ “Top” here describes the areas identified most frequently by student respondents when asked to give examples of a digital activity they find “really useful on your course”.

Section 2

Data cleaning and analysis approach

Overview

Here, we outline the data cleaning and analysis approach for Q17a, for the benefit of those who may wish to replicate the qualitative analysis presented in section 1 for their own institutional data sets. We describe the data cleaning process in detail as well as the approach taken to analyse the data using primary and secondary level codes.

Starting with the entire student response data set of 25,485, removal of blank and garbled responses left 12,857 responses. Two main types of responses were identifiable. The first type of response explicitly answered the question, describing a digital *activity*. The second type of response simply stated a digital *tool*. Disregarding the second type of response would have reduced the size of the data set and ignored the input of many students who responded to this question. A cleaning approach was developed to retrieve the best quality data, whilst making the most of as many of the responses as possible (Step 1 below). This approach narrowed the data set of 12,857 students for Q17a to 7,516 responses.

Overall, the following steps were taken for data cleaning and analysis for responses to Q17a:

- Step 1. Data was cleaned to remove any ambiguous comments
- Step 2. Included data was coded according to high-level themes
- Step 3. High-level themes were sub-coded to uncover more detail
- Step 4. Indicative quotes were identified for each high-level theme
- Step 5. Discussion of findings

Step 1. Data cleaning to remove any ambiguous comments

Responses were *included* in the analysis data set if: there was specific emphasis on a digital activity or if an example was given for the use of a digital tool (1a); the digital activity was clear but no verb was used (1b); a verb was used to describe the purpose of the digital activity (1c); the software tools mentioned could be ascribed reliably to a specific activity (1d). Responses were *excluded* if they could not be ascribed reliably to a specific activity (1e).

The cleaning approach outlined in (a) through (e) below was designed to make the most of as many of the responses as possible, whilst ensuring that quality data was used. Items (a) through (d) give detail on the response types which were included; item (e) gives detail on responses which were excluded.

a) Inclusion of responses based on specific mention of a digital activity or if a specific use of a digital tool was mentioned

The examples included below explicitly mention digital activities. Where multi-functional digital tools are mentioned, they are included only where the response also mentions the specific digital activity for which the tool is used.

Examples of included responses
Anki flashcards
Dropbox for group work
Excel classes, Excel coursework, Excel formulas, Excel graphs
GIS mapping
GitHub for coding, storage or peer collaboration
Google Search, Google Calendar, Google Scholar, or Google Hangouts
Kahoot polls, Kahoot in class and Kahoot quiz
Latex word processing
Library search
One Note for reports or to make notes
Peer wise for revision
PowerPoint for presentations
Quizlet for student revision
Socrative quizzing, Socrative online exam MCQs or Socrative in class
Survey Monkey for an assignment, collaboration or availability
Trello - Management of activities through boards
VLE (named) and description was included
Word for reports or to make notes

b) Inclusion of responses where the activity was clear but no verb was used

The examples of responses included below mention nouns (e.g., assessments, discussion forums, webinars) for which the related digital activities are implied. Whilst these responses may not be explicit in describing the digital activities the respondents were involved in, such as those in 1(a), the activity is identifiable and so responses of this type were included in the data set.

Examples of included responses
[completing/submitting/working on] assessments
[completing/submitting/working on] assignments
[completing/submitting] surveys
[completing/practicing/working on] exercises
[watching/listening to] audio lectures
[listening to] audio notes/podcasts
[completing] quizzes
[creating] Gantt charts
essay [writing]
[keeping/submitting an] e-portfolio/portfolio
[reading] e-books was included
[taking part in] discussion forums
[using] database for references
[completing/submitting/taking part in] tutorials
[watching] YouTube videos
[watching/taking part in] webinars

c) Inclusion of responses where a verb is used to describe the purpose of the digital activity

The examples of responses included below describe digital activities briefly in terms of verbs, e.g., calculating, polling, submitting. While these responses may not be explicit in describing the digital activities the respondents were involved in, such as those as in 1(a), the activity is identifiable and so responses of this type were included in the data set.

Examples of included responses
Browsing [internet]
Calculating
learning Adobe suite/Excel/OneDrive...
Mapping
polling/quizzing
programming, processing or coding
Researching
screen casting
Searching

Sending
Simulating
Submitting
video editing
video recording
Writing

d) Included software tools where digital activity was inferred

Many respondents simply mentioned a tool, with no description of what they used it for. To ensure no value was lost from the data, a list of software tools which are very specific, typically used for a single purpose, were identified. These tools are listed below. If it was not possible to determine the specific activity a tool might be used for, the response was excluded from the analysis (see 1e).

Responses included	Comment
Acland’s Academy for Anatomy	mostly used for individual learning
Aspen	discipline specific tool used for simulation software
AutoCAD/ CAD	used to design or create drawings
BIM	used to design or create drawings
Duolingo	used to learn languages, individual basis
EBSCO	used as a database host
Eir grid	used as data source
Flexbox Froggy	individual game used to learn to code
FontStruct	used to create fonts
Genealogy	used for research
Geogebra Simulation	individual simulation/learning
Genogram	used for flowchart creation, individual basis
Hotpotato/ Hotpots	used to design crosswords or online games, individual basis
JSTOR	used for research
Justis	used for research
Kaggle	used to practice coding and analysis methods
Khan academy	individual learning platform
Loggerpro	used for data logging on an individual basis
LinkedIn Learning	online video courses used by individuals
MATLAB	used for numerical analysis
Mahara	used for individual curation of an e-Portfolio
Menti/Mentimeter	used for interactive polling
Mendeley	used to store, organise and cite references
Minitab	used for statistical analysis
NCCA planning tool	curriculum planning tool
NVivo	used for qualitative data analysis, individual basis
Packet tracer	network simulator for practicing
Power bi	used individually for graph presentations
Prism Statistical	graphing software

Proteous	individual circuit design and testing simulator
Pecha Kucha	mainly used to create and give presentations
QGIS	Used for mapping and analysis on an individual basis
Qquickly	used for taking attendance
pSpice simulations	individual circuit design and testing simulator
Reaper	digital audio production application (but it does also have a forum element)
Refworks	used to store, organise and cite references
Sci-Hub	used for individual research database
Solo Learn	used for learning to code
Skype	used for communication
Solidworks	used to design or create drawings
SPSS/STATA	analysis on an individual basis
Slido	used for interactive polling
TED Talks	online videos of speakers
Testout	training website for various softwares
Topsim	management simulation
Traceparts	database of 3D models, CAD files and 2D drawings
Android Studio	individual development environment for Google Android
Tableau	interactive data visualization software
Utah webpath	pathology images, text, examinations, and tutorials for medical education
W3Schools	used for learning to code
Westlaw	database host used for research
We chat	used for communication
Webquesting	used for learning to code
Yahoo	used as search engine
Zotero	used to store, organise and cite references

e) Multifunctional software tools not included where digital activity was not clear

Many respondents simply mentioned a tool with no description of what they were using it for, as outlined in 1(d). Responses mentioning multifunctional tools for which it was not possible to identify a specific purpose, i.e., tools that can be used for a variety of different digital activities, were not included in the data set used for analysis. These responses are shown in below.

Please note that many of these tools have been included in the analysis data set, where they have met the inclusion criteria outlined in 1(a)-(c) and they have indicated the activity they are used for.

Responses excluded	Some examples of their multifunctional use
3DSMax	learning to use/assignments with this software for 3D modelling, animation, rendering, and visualization

zbrush	learning to use/assignments with digital sculpting tool for texturing and painting
Adobe	Adobe and Adobe variations e.g. Photoshop, Illustrator, Premiere Pro
Anki	creating/accessing the intelligent flashcards
Audacity	learning to use/assignments with easy-to-use, multi-track audio editor and recorder
Canva	learning to use/assignments with graphic design platform
Dropbox	organising resources/collaborating with others using this file hosting service
Google	suite of software tools
Google Docs	word processor used for note taking/assignments/collaboration
Google Drive	organising resources/collaborating with others using this file storage and synchronization service
Google Forms	completing/creating survey with the survey administration app
GIS	learning to use/assignments with this computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface
GitHub	learning to use/assignments/collaboration/storing code using this platform used by a community of developers to discover, share, and build better software
Invision prototyping	learning to use/assignments using this digital product design platform
Kahoot	learning to use/assignments using this game-based learning platform
Latex	learning to use/assignments/collaboration with this document preparation system used for the communication and publication of scientific documents
Learn Smart on Connect by McGraw-Hill	can be used as an individual learning platform or as instructor driven with the setting of assignments. Learn Smart Assignments and Learn Smart McGraw-Hill have been included, but not Learn Smart McGraw-Hill
Library	accessing learning material/researching/communicating and collaborating on group projects
LinkedIn	creating a profile/searching/learning to use/assignments using this platform which allows access to knowledge, insights and opportunities.
Logic Pro Premier	learning to use/assignments with this video editing program
Microsoft	suite of tools
MS Word	note taking/assignments/collaboration using this software for word processing and document creation
MS PowerPoint	accessing learning material/assignments/creating presentations using this presentation program
MS One Note	note-taking program for free-form information gathering and multi-user collaboration
MS Excel	learning to use/assignments/collaboration/organising time using this spreadsheet program, a powerful data visualization and analysis tool

MindTap	learning platform, but aspect of which not mentioned so treated like the VLE
Mobile phone	doesn't specify that this is in class or what it is for
Mudbox	learning to use/assignments with this 3d digital sculpting and texture painting software
NetAcad/Netbeans	learning to use/accessing learning material/collaboration using the Cisco Networking Academy curriculum, learning platform, support & training platform
P5	learning to use/collaborating using this JavaScript library for creative coding
Padlet	discussions/collaboration/note taking and note sharing using this online noticeboard
Peerwise	completing/creating quizzes using this online learning tool which allows for discussion and learning
Piazza	creating/accessing using the software for Q&As
Prezi	accessing learning material/assignments/creating presentations using this presentation program
Quizlet	creating/accessing flashcards, games and learning tools
Research gate	creating a profile/searching/learning to use/assignments using the research repository
Sibelius	learning to use/creating/assignments/collaborating with others on this composition software
Socrative	completing/creating initiate formative assessments using this software through quizzes, quick question polls, exit tickets and space races
Splunk	learning to use/assignments using this software for searching, monitoring, and analysing machine-generated big data via a Web-style interface
Smartbooks	learning to use/assignments using bookkeeping and accounting software
sniffy software	learning to use/assignments using this virtual laboratory where students can run experiments
SQL	learning to use/assignments using this software for programming and designed for managing data held in a relational database management system
Survey Monkey	completing/creating online survey tool
Terminal	learning to use/assignments using this command module
Thomson Reuters Eikon	learning to use/assignments using this very expensive financial information service, including company data, market data, news, country and economic data, analytics and trading tools
todoist	learning to use/assignments/collaboration/organising time using this list making application
TLC modules	learning to use/assignments using this software
ToonBoom	learning to use/assignments/collaboration using this animation software
Trello	learning to use/assignments/collaboration/organising time using Kanban-style list-making application
Visual studio 2019	learning to use/assignments using this integrated development environment

VLEs (various)	accessing information, resources, assessments; interacting
Volatility	learning to use/assignments using this open-source memory forensics framework for incident response and malware analysis
Web series	learning to use/assignments using this software
Wiki	accessing learning material/creating/collaborating using this hypertext publication collaboratively edited and managed by its own audience directly using a web browser
[Virtual] Worlds	learning to use/assignments using this 3D design software

Step 2. Included data was coded according to high-level themes

The cleaned data set was coded according to the purpose or main function indicated in each response. Ten high-level themes were identified, as follows:

- Polling/quizzing
- Accessing the VLE
- Accessing learning material
- Using discipline-specific software
- Communicating and collaborating
- Creating content
- Researching
- Using core programmes
- Making notes
- Organising time and resources

An additional theme, 'None' was added to accommodate the large number of responses in which students indicated that they were not engaging in useful digital activities on their course.'

Step 3. High-level themes were sub-coded to uncover more detail

The high-level themes were further subdivided into specific digital activities (see section 1). These sub-theme codes combine associated verbs with nouns to give an explicit statement to represent specific digital activities.

For example, the specific digital activities for the polling/quizzing theme are:

- Answer/complete/submit responses to surveys
- Ask questions
- Complete/do test/MCQ/quizzes
- Complete attendance poll
- Creating poll/quiz

- Interact/participate in poll/polling

Step 4. Indicative quotes were identified for each high-level theme

Responses were selected for each high-level theme to represent the variety of specific digital activities that students found useful in their course. These responses are shown in the table in section 1. A range of engagement in digital activities was evident. From these indicative quotes, the narrative of the qualitative analysis was developed to reflect the experiences of students who responded to this question.

Step 5. Discussion of findings

Discussion of findings was completed based on thematic analysis of the results, comparison with comparative results from the INDEX Survey of Staff Who Teach and other relevant data.

Benchmarking your data

The approach used here to conduct the thematic analysis differs from that used by JISC⁴ to conduct the UK's Digital experience insight survey so it is not directly comparable. However, if you wish to compare your data with that of the UK you may wish to take note of the following:

- Comparing the top three high level themes here (polling/quizzing, accessing the VLE and accessing learning material) with those in the UK (search/research, access and engage (in class)), we can see some correlation in spite of categorisation differences.
- The main difference between both sets of themes is that 'search/research' is top of the UK dataset but features outside our top three, as the sixth most frequently mentioned high level theme. However, it is important to note that from the indicative quotes the UK have included 'finding information online' in this category which overlaps with their "access' theme. In the INDEX analysis we have only included those specific activities involved in academic research mentioned by students.
- Also to note, the UK data set polling/quizzing is split into two separate categories: engage (in class) and answer. If these were combined it is likely they would appear as the top theme, as in the case here.

⁴ JISC (2019). Digital experience insights survey 2019: findings from students in UK further and higher education. Appendix 2. Bristol: JISC.