Change Makers: **Graduate Digital Skills**

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Introduction

Our Change Makers project set out to explore the digital skills needed in graduate employment. In particular, we aim to understand:

a) What digital skills and competencies are highly valued by employers and how are they are applied in the workplace.

b) Where LSE graduates learnt their digital skills and LSE's role in the provision of digital skills training.

The primary motivation of the project is to help current students enhance their graduate employability by outlining the skills and competencies that are deemed to be important by employers and to investigate the variations of digital skills across sectors that LSE students should account for in preparing their career paths. Through a more detailed understanding of how digital skills are deployed, we aim to demystify the ambiguity surrounding digital skills often present in job descriptions, and thereby help students 'stand out' during the application process.

This project will directly provide value to the LSE Digital Skills Lab (DSL) and Careers services, who in turn can better prepare and advise LSE students on digital skills. We hope our insights and recommendations will allow the DSL to adapt its learning provision to not only cover the rights skills but also to teach with examples of how the skills may be used in a 'typical' workplace. It is also anticipated that this could benefit the creation of more specialised 'careers focused' digital skills workshops.

Methodology

We have answered our research questions mainly through a 'Graduate Digital Skills' survey we designed, constructed, and had sent to recent LSE alumni. Our research seeks to understand, with some depth of detail, how digital skills are used by graduates. We anticipated that HR teams may not precisely convey how digitally proficient prospective graduates should be for roles, with ambiguous language, such as 'familiarity with Excel/Python', often being used. Alumni were considered to best placed to understand the day-to-day use of digital skills. Moreover, we benefitted from low-barrier access to alumni through the LSE Alumni Engagement team.

Recent alumni were classed as individuals who had graduated between 0 and 5 years ago. With an approximate size of 20,000 individuals, even a low response rate (e.g., 1-5%) should provide rich data. Moreover, we anticipated that more recent graduates would have exposure to more current skills, be able to recall their graduate role more fully, and be more willing to participate in the survey.

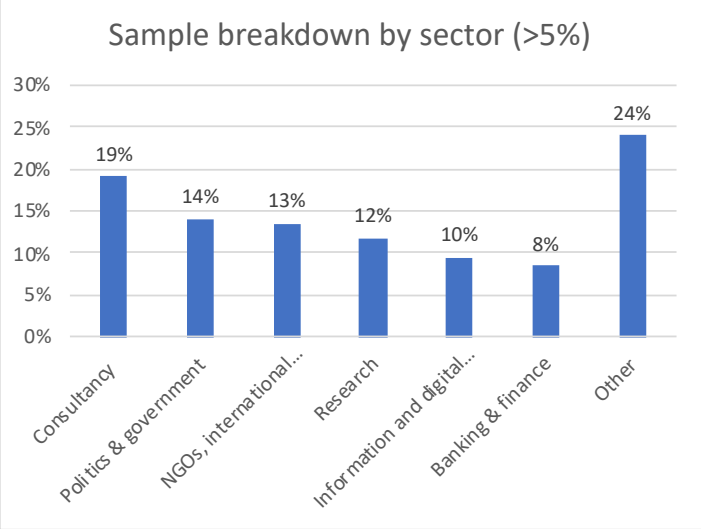
Our data was collected through a single mixed-methods survey distributed by email to recent alumni on our behalf and available for approximately two weeks in February. This survey enquired about the graduates first role after graduating, the general cluster of skills they used in their role (e.g., data visualization), and specific skills they used with the opportunity to provide in-depth description. Alumni were also asked about the provision of digital skills training in the LSE. A reminder email was sent approximately one week after the initial invitation email was sent.

The last question provided respondents with the option to submit their contact details for follow-up interviews to further discuss how they used digital skills in their graduate roles. Due to resource constraints no follow-up interviews were conducted with alumni.

We secured access to Graduate Outcome Survey data to help categorize alumni. Although elements of this survey were used, such as the classification of alumni job sectors, the main data could not be easily operationalized and so is excluded from this report.

Sample

A total of 178 responses were completed which were at least partially completed. The graph on the right provides a breakdown of the sectors alumni worked in after graduating. The sample was wholly voluntary. Unit non-response was high, with 178 out of the 435 initiated responses being recorded. Item non-response was also high, with many questions having low or no answers.



Findings

Background on data collected

Alongside basic background data, such as graduate role sector, broadly two types of data were collected in the alumni survey. Firstly, data on skills used in a respondents' first role after graduating which provides data on up to three specific skills with details on how the skill was used and how it was learnt. Secondly, respondents were asked to reflect on the provision of digital skills training at the LSE and any improvements they may wish to see.

For analysis of the first type of data, seven analysis groups were created from the final sample of 178 respondents. Each analysis group is made of respondents with similar graduate role sectors. Such grouping allows meaningful insights to be made about the types of skills used within different career sectors. The second type of data was analysed more generally rather than by each analysis group. This reflects the respondent's more general experience of the LSE versus their specific experience in the role after graduating.

The following sub-section will provide insights on the broad types of skills, specific relevant skills, and data on how skills were learnt, for each of the seven analysis groups. The analysis of specific skills is fully provided here since there is value in having comprehensive data for guiding careers advice and the design of digital skills training initiatives. In contrast, findings for the second type of data are integrated into the recommendations section.

Findings on specific skills

Group A - Researchers

- **Top skill clusters**: Data Visualisation; Productivity / Office Applications; Data Science and Analytics

Group A covers 30 people with a strong research element in their graduate role. Specifically, this included those who selected 'Research', 'Market research' and 'Education and teaching'. Typical job titles included 'Research assistant', 'Data analyst' and 'Operations manager'.

- **Excel skills - basic analysis and preparing data**
  - Primarily used for storing and preparing data for more sophisticated data tools.
  - Features mentioned include filtering to find records of interest, sorting to arrange data, pivot tables, index and match to find corresponding data, and Excel hygiene such as 'freeze panes'. There was no mention of data cleaning functions (e.g., trim).
  - Excel was mentioned three times as a 'stand out' skill during their recruitment process. E.g., "[My] Excel mooc was brought up during interview".
  - Two respondents mentioned using LSE IT training as part of their Excel learning, however most identified self-guided learning techniques (e.g., YouTube or books).

- **MO Office skills - formatting features**
  - Microsoft Office skills focused on formatting documents and presentations. E.g.,
  - Features mentioned include line-spacing, alignment, different pasting types, use of SmartArt, referencing tools, hyperlinks, tables, printing and sharing, inserting images (e.g., from R), track changes, and commenting.

- **R - visualising and modelling data**
  - R libraries mentioned were ggplot and ggplot2 for data visualisation, tidyverse, caret, rmarkdown for recording operations, and rshiny for displaying results.
  - For example, a market research data analyst described how they use R to calculate descriptive statistics to make sense of data (using 'ggplot' to construct histograms and scatterplots), before constructing a model (using the 'caret' library).
  - Some learnt R within LSE classes, but just as many were self-taught.

- **SQL - complimentary tool for big data**
  - SQL was mentioned as being useful for pulling together multiple datasets (e.g., "In real life, the data you need for analysis tend to be split over numerous tables in a relational database. Using shared keys, you need to merge these tables until you have every column you want in your query.") and being more efficient than Python or R for handling and cleaning large data sets. In this way R and SQL are described as being complimentary, often being used together.

- SQL was also used to complete full analysis by itself, e.g., “"I often do a cohort retention analysis, where we determine whether customers of a particular service become more loyal over time. I can do most of this in SQL and then create visualizations in Python. It starts with a window function to find each user's month of acquisition, then a self join to a similar table on the past month and user.”
- SQL was almost wholly a self-taught skill and occasionally taught on-the-job

Group B - NGO & Public Affairs

- **Top skill clusters**: Productivity / Office Applications; Digital Marketing; Data Visualisation; Data Science and Analytics

Group B covers 30 people involved in NGOs and public affairs. Specifically, this included those who selected ‘NGOs, ID, and Charities’, ‘PR & communications’, ‘Marketing’, and ‘Environment’. 80% of respondents belonged to the NGOs category. Typically, respondents were responsible for administration, fundraising/grant writing, and some research.

- **Excel - versatile tool for project management and data**
  - Excel was primarily used for managing and evaluating projects with data visualisations and production of Gantt charts etc., and for administrative purposes, such as tracking donor information and budgeting.
  - Features mentioned include IF function to perform logical checks, VBA macros to automate cleaning, Pivot Tables and Charts for visualisation, VBA with VLOOKUP to extract required information, combo charts, Gantt charts for project management, pulling data from SQL database into Excel, mail merge, multi-level sorting and filtering, combining cell data together, goal seek, conditional formatting, ensuring that charts produced for reports all have the same format, and Net Present Value function for business modelling.

- **Microsoft Word - formatting and collaboration**
  - Regularly used day to day for report writing and briefs.
  - Features mentioned include Word templates (creating and editing custom templates), regular formatting, sharing, comments and track changes.

- **Salesforce - managing fundraising efficiently**
  - While many discussed using Excel for donor tracking and management, several said their organisation moved to specific database software like Salesforce.
  - Qualitative data suggests the main operations were data entry, creating reports and queries for the database, cleaning data, visualising data (by using Looker tool), and building email campaigns for events (using a plug-in tool).
  - For example, one respondent described how they input donation information into the database and update outdated information, which they use to thank the donor for their contribution and information for tax purposes, track donor activity throughout a given time frame and “gauge a donor's level of giving in comparison to their capacity to give and geographic location.”
  - Half the respondents said Salesforce was required for their role.
  - One Salesforce-using respondent said that their previous experiment with MS Access stood out during their interview. Another respondent states that even ‘basic

knowledge' of a program like Salesforce would have been very beneficial for being hired stating that it is widely used in NGOs and civil rights groups.

Group C - Policy and Government

Top skill clusters: The main skill clusters selected were Productivity/Office Applications; Data Science & Analytics; Data Visualisation

27 respondents feature in Group C, consisting of respondents who selected 'Politics and Government'. Typical job titles included 'Research Analysts/Associates', 'Economists' and 'Policy Advisors'. There is rather significant heterogeneity in the job scopes within this occupation group, but they by and large work directly or indirectly with government policy development.

- **Digital Designing skills is a core competency**
  - While none of the respondents have digital designing as their primary job scope, many use digital designing software like Canva, Adobe Indesign and Photoshop.
  - Production of infographics and promotional materials is a key function performed by those in these occupation group

- **Data management using R**
  - Many respondents used R to automate tasks such as downloading datasets. Run statistic regressions and calculate summary statistics
  - Only 20% of respondents managed to acquire the skill through LSE course curriculum, and had to rely on MOOCs and self-guided learning to pick up knowledge in R.
  - One respondent shared that his ability to use R "impressed [his] employer"
  - Some respondents shared that Stata is used to make statistical calculations and panel-regressions. All of them shared that that grasp of Stata acquired through LSE course curriculum was sufficient.

Group D - Information Technology:

- **Top skill clusters:** Data Visualization; Data Science & Analytics; General Programming

17 respondents feature in Group D, consisting of respondents who selected 'Information and Digital Technology'. Typical job titles included 'Data Scientists/Analysts' and 'Software/Product Engineers'. Respondents from Group D generally employed more technical digital skills due to the nature of their job scope. In addition to the skill clusters mentioned above, productivity software and cloud computing are frequently used by a smaller proportion of respondents.

- **SQL is "highly essential"**
  - About a third of respondents regularly use SQL to query data and manage large databases. SQL thereby serves as the "basis for all visualization tools" and allows for the construction and maintenance of databases
  - None of the respondents acquired SQL skills from LSE and mostly obtained knowledge they presently used in their job through self-guided learning, MOOCs and from other universities

- **Tableau and Power BI are powerful and oft-used data visualization tools**
    - Tableau dashboards and visualisations are effective tools to "tell a story" and often used for publishing to end users
    - Most respondents learnt on the job, as these respondents probably attended LSE before the integration of Tableau into LSE100.

- **Python is "a versatile language" with broad applicability**
    - Used to clean and mine data, and is especially useful for large scale datasets
    - Some python packages used include numpy, pandas, matplotlab
    - Respondents emphasise the effectiveness of web-scraping and automation functions that enhances work productivity

- **Importance of Excel**
    - Respondents generally shared that LSE could strengthen support for their students in developing excel skills(VLOOKUP, SUMIF and Pivot Table functions)
    - One respondent shared that the Excel course provided by the IT department was too basic and would have preferred if the course content "delved into professional uses"
    - PowerPoint and Excel skills are important for professional purposes.

Group E – Consulting

- **Top skill clusters:** Productivity / Office Applications; Data Science and Analytics; Data Visualization

37 respondents represent the Consulting sector. There is wide range of experience within this subsample as there's sizeable number of entry-level consultants as well as senior consultants and managers. Similar to the banking sector, the client-facing nature of jobs in this sector, it makes sense that the most employed digital skills involve data analysis and visualization through tools like Excel, Tableau and Power BI, and the subsequent presentation of data through tools like PowerPoint. In addition, smaller fraction of respondents also emphasized the importance of programming languages such as Python and R to automate tasks.

- **Microsoft Excel as a data handling and model building tool**
    - Primary use of Excel by consultants is in a data management and manipulation capacity, and occasionally for model building using VBA (depending on the type of the project and specific branch of consulting). Some of the typical features for these three tasks include:
        - Pivot charts and tables with filters and slicers to segment the dataset and identify trends; this is used in conjunction with the Thinkcell in Powerpoint to visualize the pivot chart output
        - Data validation features to avoid duplications
        - Typical Excel math functions as well as matching functions like VLOOKUP and INDEX MATCH are used for the model building
    - Most of the subsample acquired its knowledge of excel through self-guided learning, MOOCS, and their employers; the use of LSE' DSL was minimal

- **Microsoft Office (excluding Excel and Access) is used as a communication and organizational tool**
  - Presentation editors are used extensively for multiple purposes, ranging from communicating key messages and presenting data insights to the client to handle project management requirements (i.e. status trackers and to do lists). Some of they key features include:
    - Chart making using the Thinkcell functionality.
    - Polling plug ins and other interactive additions when presenting/working online
  - Outlook, in addition to its email functionality, is used for its calendar feature and sending out invites (when integrated with teleconferencing software like Zoom or teams)
  - Word is primarily used for drafting business documents like letters of proposals
  - Similar to case above with Excel, this subsample attained its understanding of Microsoft Office Suite though their employers and self-guided learning

- **Power BI and Tableau**
  - These two data visualization tools are used for story telling purposes; they involve building dashboard to supply analysis to a wider audience.:
  - Attained knowledge on how to operate these softwares through on-the-job training

Group F- Finance

- **Top skill clusters:** Productivity / Office Applications; Data Visualization; Data Science and Analytics

18 respondents represent the Banking and Finance sector. Majority of these respondents were "analysts", which is the junior most/starting position at financial institutions. Given the numerical and client-facing nature of jobs in this sector, it makes sense that the most employed digital skills are Excel and Presentation editors.

- **Microsoft Excel as a model builder and data management tool**
  - For over 95% of the respondents, Excel is the primary tool for model building and management of large client datasets. Some example features used to perform these tasks are:
    - Pivot tables: summarizes information from large datasets; useful for slicing and dicing data according to internal and external requirements Data validation features to avoid duplications
    - Typical Excel math functions as well as matching functions like VLOOKUP and INDEX MATCH are used for the building complex financial model
    - Visualization of data: Graph production and linking it PowerPoint
  - A smaller subsection of this group also indicated the importance of knowing VBA to make repetitive data manipulation tasks easier
  - Most of the respondents acquired and honed their Excel skills either through on-job training or self-guided learning (only 3 replied that LSE's DSL was the source of their learning

- **Microsoft Office (excluding Excel) as communication and organizational tool**
  - PowerPoint is used for creating impactful slides for internal and external use; respondents reiterated the importance of consistent formatting and good use of graphs that are linked to parent Excel file.
  - Microsoft Word tends to be used for drafting various business documents like client letters and written proposals
  - Microsoft Outlook is used for handling email; respondents homed on the usefulness of good inbox management and calendar management skills, so applying features like conditional formatting rules and folder can be useful in staying organize
  - Again, most skills related to Microsoft Office are learned through their employer or self-guided learning, or via Massive Open Online Courses like Udemy/Coursera:

- **SQL deployed as complementary tool for large datasets**
  - Only a select few respondents seemed to use SQL regularly; according to them, functions of SQL for extraction of data as well as calculation and summarization of data are key.
  - Though there seems to very limited wide-spread use of the software
  - All the related training was provided by the employer

Finally, while not very widely used among the respondents, there did seem to be an increasing integration of Python into everyday tasks as noted by respondent G-5. Further, features of Python like “Pandas”, “Numpy”, “Matpilotlib” were used as substitutes in place of the typical excel math and matching functions because of their computational power advantage.

Group G- Retail and Manufacturing

- **Top skill clusters:** Data Visualization; Productivity / Office Applications; Data Science and Analytics

8 respondents comprise the Retail group. Given the considerably smaller size of this Group and wide spectrum of roles and experiences, it is difficult to draw meaningful insights and generalize results. Nevertheless, Microsoft Office Suite in general serves as the most important digital skills among those surveyed.

Microsoft Excel deployed as data management tool

- Like in the Consulting and Banking Group, Excel is used for data manipulation and analysis, using the tools discussed previously in those sections.

Microsoft Office (without Excel) deployed as communication and organization tool

- PowerPoint is used for creating impactful decks for internal and external stakeholders.
- Again, similar features as discussed in the Group F and G are utilized to make the slides

SAP is essential

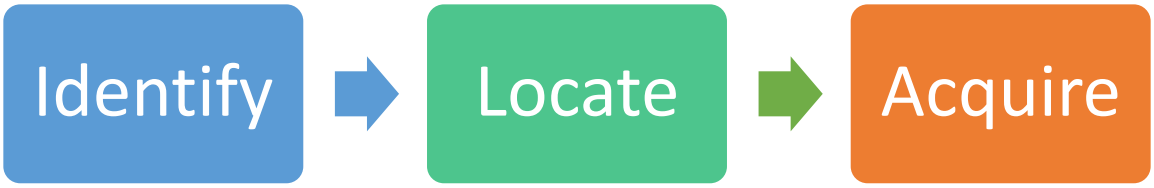
- SAP can be used in variety of contexts; one respondent noted that SAP is used for the purpose of demand and production planning as well as master data maintenance.

While it's understandable that SAP is learnt on the job given its limited applicability to wide range of sectors, skills pertaining to Microsoft Office Suite were acquired through employer-provided-training or through self-guided learning/MOOCs

Recommendations

Specific insights that were uniquely relevant to particular job sectors were fleshed out in the earlier 'Findings' section. This section aggregates sentiments that are generalisable across the various occupation types. Respondents were given the opportunity to provide suggestions on how LSE can better equip students with career-relevant digital skills. Respondents from earlier batches generally shared that LSE did not have digital skills workshops that were "up to industry level" then, and reflected that they would have benefitted immensely if digital skills training was more widely accessible when they were still in school. While some respondents, ostensibly the more recent graduates, utilised resources provided through the Digital Skills Lab (DSL), they opined that a wider variety of digital skills can be covered at greater depth and that LSE can closely examine industry-level trends to inform course structure and design. On the other hand, other respondents had positive reviews for the HTML and Excel training courses available at LSE and expressly encourage current undergraduates to harness these resources. We generally observed that LSE graduates seem to have mixed experiences in their learning of digital skills at LSE. Based on the survey responses, we thus consolidated a series of concrete recommendations to hopefully improve the delivery of digital skills courses at LSE.

We noticed that the challenges faced by Graduates took place at different phases of their learning process and synthesized the recommendations according to a guiding framework we henceforth refer to as the "ILA" framework.



At the "Identify" stage, students face informational frictions in identifying valuable, career-relevant skills. Once students are able to pinpoint the skills they aspire to learn, they enter the "Locate" stage where they seek out quality digital skills courses/workshops that fulfill their learning needs. Lastly, it is crucial that the digital skills opportunities provided by LSE are optimally designed to cater to students' varied needs and preferences while ensuring that learning outcomes have lasting benefits into one's careers. Interventions proposed at each of the three stages in the ILA framework are synthesized from the suggestions made retrospectively by the survey respondents and should adequately alleviate the challenges that conventionally afflict LSE undergraduates in their attempt to acquire digital skills.

Identify:

1. **Raising awareness on the importance of digital skills:** Many respondents expressed regret in realizing the importance of digital skills only after they have graduated. Some shared that they were not aware that data science "was that well-regarded" and that possessing such skills would have enhanced their employability significantly. Others would have preferred if they had greater awareness of the types of software used in different job types and industries so that they can appropriately acquire relevant digital skills. LSE could consider providing targeted informational campaigns through Departmental bulletins or school-wide notices that extol the importance of digital skills. The findings of this report can also be shared with the wider school population to provide a comprehensive overview of the skills needed across various job sectors. Providing career guidance talks that focus on the application of digital skills in various career paths would also eliminate informational frictions that might have deterred students from acquiring digital skills in the first place.

2. **Making digital skills courses mandatory:** Some respondents were inclined towards a more institutionalised, top-down approach to make learning digital skills compulsory. In practice, LSE would pre-select digital skills that have been deemed valuable and this would relieve students of the onus of identifying skills and then curating learning platforms to meet their learning needs. This proposal can supplement optional courses that students can readily tap on through the DSL. The mandatory Digital Skills course can be constructed in the image of the LSE100 course, making it compulsory for students to participate in but not officially graded as part of their degree award. Respondents suggest that the compulsory course should cover Excel skills, data visualisation skills, basic programming skills in R and Python and in-depth professional skills in Microsoft Office software like PowerPoint. We surmise that graduates recognised in retrospect that they would not have optimised their learning of digital skills if left to their own devices. Alternatively, a softer approach using defaults where students are automatically enrolled into basic digital skills course and would have to opt out if they preferred to can be considered. This solution would allow for students to exercise personal autonomy over their learning.

Locate

3. **Improve the visibility and accessibility of digital skills courses/workshops:** Many respondents reflected the hope that LSE can strengthen the resources and technical support available to undergraduates but do not seem to be aware of the wide array of course offerings at the LSE Digital Skills Lab (DSL). We suspect that a significant proportion of recent graduates were not sufficiently informed of the availability of pre-existing DSL workshops during their schooling years and were thus unable to fully take advantage of readily available resources. We thus recommend that DSL can expend greater effort to publicise pre-existing course offerings, thereby increasing the take-up rate of these courses.

Acquire

4. **Focus on practical application of digital skills:** Some respondents shared that LSE had been very successful in imparting theoretical knowledge but could do better in ensuring that students were able to practically apply the skills they've acquired. One example that was particularly salient across the Finance, Research and Information Technology sectors was the use of programming language like R to conduct statistical analyses as opposed to dedicated softwares like Stata and SPSS which are more conventionally taught at LSE. Many shared that requisite knowledge in Stata was "not helpful in the job market for consumer research and technology companies" and that basic training in R and Python would have been more valuable. We suggest that existing courses in statistical analyses and econometrics which traditionally employs Stata can pivot towards integrating programming language in the course content. This ensures that core learning objectives are met, and students can acquire skills that have wider real-world application.

5. **Workshops that integrate multiple complementary software:** Many respondents shared that digital software are often used synergistically. It is important for students to not only be aware of how a particular software operate in isolation but how one can comfortably perform tasks using multiple interrelated software. For example, a researcher/analyst should ideally be able to query data from SQL, crunch the data using Python or R and design informative visualisations using Tableau and Power BI. Respondents share that the comprehensive understanding of how different software work in harmony to perform a broader, overarching task is a valuable asset that graduates ought to possess. Digital skills courses at LSE can be re-modelled to cover a wider array of skills within the course, providing more breadth than the depth currently offered through courses that solely focus on Excel or Python for example.

6. **Diversity of courses catering to varied needs:** The student population at LSE is rather heterogenous and the feedback we've received on the preferred course content and intensity varies extensively. Some preferred elementary courses that cover the basics while others preferred if there was a wider selection of "lesser-known softwares or applications". LSE Digital Skills Lab could consider expanding the suite of programmes to cater for a wide spectrum of skill sets and also at varying levels of difficulty.

7. **Relieving term-time pressures by providing summer classes or extending resources to alumni:** Some respondents reflected that they would have been unable to fully reap the benefits of pre-existing courses during academic term time and would have preferred if courses can be offered outside of term during summer or even to alumni who would later require this in their jobs. Expanding access to digital skills courses/workshop beyond academic term time is a possible solution to the constraints faced by undergraduates who had wished to pick up digital skills but were unable to.

Data limitations and future research

This project has benefited from rich data insights from LSE alumni on what skills are used in graduate roles, how they are used, and the role of LSE in preparing them with these skills. Both unit and item non-response was high in the survey. Although approximately 2% of recent graduates initiated a response, only 1% good quality responses containing meaningful data were collected. This primarily limits the external validity of the quantitative data. Despite this, the resulting limitations to our research are minimal. This research has given a unique exploratory insight into graduate digital skills with a focus on qualitative breadth rather than exact representativeness.

Methodologically the data focuses on LSE students who may have begun their studies at the LSE eight or nine years ago. Therefore, while insights into digital skills for graduate roles are recent, insights on the provision of digital skills training is unlikely to be fully reflective of the current digital skills provision in the LSE. For example, some respondents discussed having workshops on R and Python available. Recently the LSE DSL (Digital Skills Lab) has begun offering these courses. This does not necessarily lower the quality of insights, indeed it validates recent changes to the digital skills offering, but does potentially limit the transferability of some insights to the current LSE student experience of digital skills which may warrant its own research.

There were initial plans to conduct follow-up interviews with respondents to extract richer qualitative data, however this was not possible due to resource constraints. Nonetheless, this research provides strong quantitative and good qualitative data to shape the design of future research on graduate digital skills involving interviews.

Resource constraints have prevented a gap analysis between our findings and the current provision of digital skills in the LSE. Such analysis is needed to operationalize our insights and the recommendations in this research identify areas to focus on.

Conclusion

This research project has uniquely delivered a direct measurement of digital skills used in graduate roles by recent LSE students. Although strong similarities in digital skills are found across career sectors, there are also nuanced differences in the specific tools used and how such tools are used. This provides an evidence-based qualitative insight into digital skills, which complements existing knowledge by stakeholders, to assist relevant LSE teams to identify the necessary digital skills for current students' prospective careers and the design of provision. Additional data on alumni reflections on digital skills provision offers a secondary set of insights intended to determine the what, how, and when of digital skills training. Positively the LSE, and the LSE DSL in particular, has further innovated since many of the respondents were at university such as by introducing courses on R and Python. Nonetheless, the recommendations in this research offer further avenues for improving the provision of digital skills for LSE students. Finally, this research project offers strong foundations in both data, allowing further specific research using qualitative interviews to deepen insights, and in methodology, providing a blueprint for similar research with alumni in the future.