Teaching Social Research Methods and Data Science Skills Online: Using Lean Methods to Build Effective E-Learning Solutions

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# Contents

Introduction .................................................................................................................. 4
What do we know about teaching social research methods and data skills online? ........ 5
Challenges of teaching social research methods and data science skills ...................... 5
How digital technology is being used to support pedagogic goals .............................. 7
Considerations for online course development ......................................................... 8

Building courses at SAGE Publishing
  Why did we launch SAGE Campus? ........................................................................... 10
  Using lean methods to develop SAGE Campus ....................................................... 11
  Lean Discovery Framework ...................................................................................... 12
  Creating a lean canvas and designing lean experiments ......................................... 12
  Developing successful online learning content ....................................................... 14
  Designing for diverse learner groups ...................................................................... 14
  Structuring and sequencing course content .......................................................... 15
  Promoting learning through the use of data ............................................................ 16
  Translating in-person training material to online ..................................................... 16
  Ten tips for designing effective online learning ..................................................... 17
  SAGE Campus online data science courses for social scientists ............................ 18

References .................................................................................................................... 19
Introduction

The way that people are learning is changing. Over the last decade we have seen an explosion of Massive Open Online Courses (MOOCs) and digital learning solutions, the rise of which has generated considerable excitement in the education community and beyond. Technologies and solutions that support online learning, such as Learning Management Systems (LMS), learning content management systems and mobile e-learning solutions combined have created a global e-learning market that is expected to grow to approximately $325 billion by 2025. (Research and Markets Report, 2017)

Online learning done well can remove barriers to learning; it offers flexible ways to learn new skills, whenever you want and wherever you are. And, in the case of some MOOCs, you can even learn for free. Creating effective online learning is, however, a challenging task. Making meaningful, engaging e-learning experiences that motivate students requires the input of experts who can effectively translate material for use online, and who can think creatively about the affordances and constraints of e-learning technology, instructional design and online pedagogy.

This challenge is especially pronounced when teaching complex and advanced topics such as social research methods, statistics and data science. The teaching of research skills places unique demands on teachers and learners alike, as they are thought to be among the most intellectually demanding courses in university education (Howard and Brady, 2015). Programming skills are also considered difficult to learn, and take many years to master (Robins et al, 2003). Given these challenges, what are the best practices to follow when developing online learning in social research methods and data science? How can academics, universities, and e-learning content providers produce enjoyable and effective online learning despite the demands facing teachers and learners some of which may be amplified by moving teaching online?

This white paper presents a review of the current literature on approaches to teaching research skills, which forms part of the PhD work Debbie Collins is undertaking at Southampton University. This literature provides a context for the development of SAGE Campus, an online learning platform produced by SAGE Publishing that provides a range of courses for social scientists to learn data science skills. This paper tells the story of our development and includes contributions from the instructors and instructional designers we worked with to develop SAGE Campus. Its goal is to share insights and guidance for faculty, librarians, learning technologists and educators who are planning to develop their own online courses in the future, or would like to incorporate online course material into their curriculum.
What do we know about teaching social research methods and data science skills online?

The teaching and learning of social research methods, and quantitative skills in particular, is of growing importance. Several high-profile capacity-building initiatives, such as Nuffield and the ESRC’s Q-Step initiative in the UK, have been launched in recent years with the aim of improving the research skills of postgraduates and undergraduates. Globally, we’ve also seen rapid growth in the demand for data science and programming skills from employers over the last five years, across multiple sectors (IBM, 2017).

A number of literature reviews have summarised the state of pedagogic knowledge about the teaching and learning of social science research methods within academia (Wagner, Garner and Kawulich, 2011; Earley, 2013; Kilburn, Nind and Wiles, 2014), which taken together suggest:

• the teaching of social research methods is seen as challenging.
• there has been little pedagogic culture to speak of (Wagner, Garner and Kawulich, 2011)
• more research is needed on how students learn social research methods (Kilburn, Nind and Wiles, 2014)
• there are sparse resources to support the teaching of social research methods, leaving teachers to ‘much trial and error as they develop and improve upon their own research methods courses’ (Earley, 2013: 243)

Though this research focused on the teaching and learning of social research methods, it’s reasonable to suggest that much of it also applies to the teaching of data science and programming skills, which are seen as just as challenging and where pedagogic approaches vary significantly. Despite the challenges, demand for these skills driven by job market growth has increased significantly, and the tech online education market is booming. ‘In the US and Canada alone, the number of coding bootcamps has grown from 67 to 91 from 2015 to 2016 (+35% in 1 year)’. (Paillard, 2017)

Currently, there is little academic research available on how social research methods and data science skills are being taught online, and how digital technology, specifically the affordances of the online teaching space, is being used to support the delivery of course content and pedagogic approaches, strategies, tactics and tasks. However, there is a growing community of online educators sharing best practice and tips from their experience of developing curricula and teaching social research methods and data science skills online. This white paper aims to contribute to that growing body of literature by sharing the experiences of the team at SAGE who developed the SAGE Campus suite of online courses.

Challenges of teaching social research methods and data science skills

Teaching social research methods and data science skills is hard, whether learners are on or offline. The challenges facing teachers and students fall into five broad categories (Kilburn, Nind and Wiles, 2014a):

1. The nature of the subject

   Students have to acquire a diverse range of skills and knowledge and learn how to apply these to a wide range of contexts. The concepts, ideas and terminology can be new and challenging to students, who can find social research methods ‘hard’ (Nind, Kilburn and Luff, 2015: 571). The application of this knowledge in practice involves students being exposed to the ‘messiness’ of the research process (Bryman, 2012; Hammersley, 2012): its iterative nature and the implications of this on research design, costs and timetables. In the case of programming skills, ‘it is generally accepted that it takes about 10 years of experience to turn a novice into an expert programmer’ (Winslow, 1996).
2. **The knowledge and skills of students and teachers**

Students arrive at social science methods courses from a wide range of academic and professional backgrounds. Students vary in terms of prior knowledge of foundational concepts, skills to engage in the subject, and familiarity with terminology, which could hinder their ability to make sense of quantitative data and outputs. (MacInnes, 2012).

3. **The organisation and structure of the course**

Developing a social research methods course requires teachers to make complex decisions around a range of factors. These include: the purpose of the course; who it is aimed at; what it will cover; the balance between theory and practice; the order in which ideas, concepts and skills will be introduced and built upon; how to engage students in the subject; whether and how to make use of learners’ own experience; how to manage diverse expectations, varying levels of knowledge and skills (a particular issue for more advanced courses); and how to use data, particularly in short courses (Kilburn, Nind and Wiles, 2014b).

4. **Fears and beliefs**

Students’ and teachers’ attitudes towards social research methods can be a barrier to learning, particularly in the learning of quantitative methods and data science skills. Specifically, statistical anxiety (the apprehension individuals experience when faced with statistical material or tasks); academic self-concept (individuals’ knowledge and perceptions about themselves in academic achievement situations); and interest in the subject matter can affect academic performance (Macher et al., 2015).

5. **The wider environment**

The teaching and learning of social research methods takes place within, and is influenced by, the wider environment in which it sits. The environment may be a physical classroom, an online space, or exist within a department, institution or workplace. In each of these, there are professional, temporal, experiential and socio-political factors that intertwine to shape, mould and remould pedagogic practices. (Alexander, 2000)

In addition, there are a number of specific challenges faced when teaching research skills online:

- An online environment can amplify the generic challenges listed above, for example, student diversity and student engagement.
- Technological challenges, such as student hardware/software requirements, can place limitations on course design.
- Communication between learners and teacher needs careful consideration and planning: how will communication take place, using which channels, and whether it will involve synchronous and/or asynchronous models of communication.
- Temporal issues, due to the often dispersed location of learners across time zones. This creates challenges for running synchronous sessions, as well as teacher responses to learner posts and requests.
- The flexibility of teaching approaches to meet varying student needs. (Collins, 2018)
How digital technology is being used to support pedagogic goals

Despite these challenges, there are opportunities for digital technology to enhance or change the ways in which research skills are being taught, both within and outside of the university context.

Work by Kilburn, Nind and Wiles (2014) identified three overlapping pedagogical goals expressed by teachers of social research methods: active learning, learning by doing, and critical reflection. Examples of how digital technology and its affordances are being used to support these pedagogical goals are shown in Figure 1.

**Figure 1 How digital technology is being used to support pedagogic goals**

<table>
<thead>
<tr>
<th>Pedagogic goals</th>
<th>Use of digital technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active Learning - making the research process visible by actively engaging students in aspects of the research process and highlighting the connections between theory and practice (Keenan and Fontaine, 2012)</strong></td>
<td>Teachers and students use actual survey data to explore topical issues and make connections between theory and methodology (Buckley et al., 2015).</td>
</tr>
<tr>
<td></td>
<td>The teacher uses an interactive whiteboard to demonstrate quantitative analysis techniques, then students and teacher work through an example together (students using analysis software on a computer) before the student does one on their own (Scott Jones and Goldring, 2015).</td>
</tr>
<tr>
<td><strong>Learning through doing - facilitating learning through the experience of conducting research</strong></td>
<td>Students use digital research tools to undertake their own research project, individually and/or as a group. Projects include writing writing their own web questionnaire using SurveyMonkey, analysing qualitative data using Nvivo, or creating a Wiki to support the writing up of a group research project (Schulze, 2009; Gullion and Ellis, 2014; Buckley et al., 2015; Scott Jones and Goldring, 2015; Silver and Woolf, 2015).</td>
</tr>
<tr>
<td></td>
<td>Software may also be used to enable students to experiment. For example, by finding out what happens if they change the parameters of a statistical model. Students may develop their research proposal using online peer review software, thereby also gaining experience in reviewing their peers’ proposals (Chen and Tsai, 2009).</td>
</tr>
<tr>
<td><strong>Critical reflection - encouraging critical reflection on research practice (Thien, 2009; DeLyser et al., 2013)</strong></td>
<td>Online peer review or online collaboration tools are used, with students reviewing their own research proposal in light of comments received from their peers and tutor (Chen and Tsai, 2009).</td>
</tr>
<tr>
<td></td>
<td>Students critique the data they collected as part of a group research project (Schulze, 2009).</td>
</tr>
</tbody>
</table>

Source: (Collins, 2016)
Further evidence from the peer reviewed literature provides examples of how digital technology may support and develop pedagogical goals such as active learning, learning through doing, and critical reflection. Figure 2 summarises the evidence.

**Figure 2 Examples of how digital technology is supporting and developing pedagogic goals**

<table>
<thead>
<tr>
<th>Ways in which digital technology is supporting/developing pedagogic goals</th>
<th>Activities &amp; approaches</th>
</tr>
</thead>
</table>
| **Builds students and teacher confidence** | • Developing students’ understanding of the architecture of data analysis software and skills in using its features. (Silver and Woolf, 2015).  
• Creating web interfaces that allow students to explore survey data with minimal guidance (Buckley et al., 2015).  
• Using interactive and collaborative tools to create collective, safe learning spaces (Scott Jones and Goldring, 2015). |
| **Helps students to achieve their learning outcomes** | • Practising social research skills and exam technique through use of online quizzes (Gönül and Solano, 2013).  
• Receiving prompt, regular feedback.  
• Data from online quizzes helps identify problematic threshold concepts. |
| **Facilitates communication** | • Facilitating students’ communication with teachers, other students, and the outside world. (Schulze, 2009; Gullion and Ellis, 2014) |
| **Assists with breaking down barriers to learning** | • Facilitating access to learning resources (Campbell et al., 2008; Schulze, 2009; Buckley et al., 2015).  
• Students can learn at a place and time of their choosing. (Chen and Tsai, 2009; Schulze, 2009). |

Source: (Collins, 2016)

**Considerations for online course development**

The pedagogic culture is still developing around social research methods and data science skills. The goal should be to stimulate reflection and dialogue among teachers and learners, and to promote the sharing of ideas both within and outside of academia.

The NCRM Quick Start Guides for Methods Teachers are useful resources for those designing online learning in this area (Lewthwaite and Nind, 2015, 2017; Nind and Lewthwaite, 2015). These resources draw from the authors’ collaboration with teachers to present new approaches to teaching social research methods. These approaches could be applied to online teaching of social research methods as well as data science skills, as illustrated in Figure 3.
### Figure 3 Pedagogic considerations for online methods and data science courses

<table>
<thead>
<tr>
<th>Social research methods teaching guidance (Lewthwaite and Nind, 2015)</th>
<th>Additional online considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design for diverse learner groups</strong></td>
<td>• Specify technical requirements, e.g. hardware and software and time requirements. If there are synchronous sessions then provide details and clarify expectations regarding attendance.</td>
</tr>
<tr>
<td>• Provide prospective learners with details on the course aims and content, being explicit about the level of prior knowledge and experience required.</td>
<td>• Reiterate course expectations regarding prior knowledge and experience.</td>
</tr>
<tr>
<td>• For advanced short course: Collect information about learners’ knowledge, skills and expectations as part of the course registration process.</td>
<td>• Consider ways in which you can support diverse learners, e.g. through reference to introductory material, finding out about their research interests.</td>
</tr>
<tr>
<td>• Design sessions with diverse learner knowledge and skills in mind and build in some flexibility.</td>
<td>• Consider strategies you will use to encourage students to use any online chat facilities, e.g. asking questions.</td>
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<tr>
<td>• Build in time for learners to introduce themselves, their experience, and expectations of the course.</td>
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<tr>
<td>• Consider ways in which you can harness student expertise, e.g. through peer learning, group work, seminars.</td>
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<tr>
<td><strong>Structure and sequence course content</strong></td>
<td>• Spend time planning the online course structure and sequencing. It can be valuable to seek advice and input from education technologists and colleagues who have taught online before, who can help with choosing technologies, chunking and sequencing material.</td>
</tr>
<tr>
<td>• Clarify the structure and sequencing of course material (particularly important for short courses, which are often fast-paced).</td>
<td>• Decide whether your course will involve synchronous as well as asynchronous elements, and what the purpose of each will be.</td>
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<tr>
<td>• Manage time constraints, e.g. by providing wider reading, additional exercises, highlighting wider learning communities.</td>
<td>• Consider whether you will use video as well as text for asynchronous sessions. Think about different forms of video, e.g. talking head, research in action, animation to bring abstract concepts to life.</td>
</tr>
<tr>
<td>• In sequencing course content consider mixing up the format to retain learners’ interest.</td>
<td>• Students appreciate feedback, so think about ways in which they can consolidate their learning and receive feedback, through quizzes, peer feedback, and activities where they have to go away and do something then answer questions on what they did, peer feedback.</td>
</tr>
<tr>
<td>• Hands-on activities can help consolidate learning of conceptual ideas.</td>
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<tr>
<td>• Evaluate learners’ understanding through questioning and being alert to body language.</td>
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</tr>
<tr>
<td>• Provide opportunities for small group learning, Q&amp;A sessions and clinic sessions, where learners can discuss issues they are facing in their own research.</td>
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</tbody>
</table>
### Social research methods teaching guidance (Lewthwaite and Nind, 2015) | Additional online considerations

| Promote learning through use of data |  
| --- | --- |

- Consider how the use of teaching data sets might be helpful to students in grasping key ideas and concepts, and in learning about aspects of the research process such as data management and analysis.
- Are there existing teaching datasets available to use that will meet your teaching goals or will you create your own, perhaps with input from your students?

- How will students access analysis software? Is it possible?
- What support, if any, will be provided to students around installing analysis software and dealing with technical queries?
- How will you deal with software updates once the course goes live?

Source: (Collins, 2018)

### Building online courses at SAGE Publishing

Armed with this knowledge of the challenges and opportunities for teaching research methods and data science online, and the principles for effective teaching outlined in Figure 3, SAGE launched its own series of online social research methods and data science courses called SAGE Campus.

### Why did we launch SAGE Campus?

Technology is changing the world around us, including the way that social science research is conducted. The increasing availability of ‘big data’ and the advances in computational tools to analyse this data means that future social researchers will need new sets of skills and methods. For over 50 years, SAGE Publishing has supported the development of research methods through our books, journals and online products. To respond to the changing landscape facing social researchers as a result of technology, SAGE set up an innovation incubator, with the goal of developing new types of tools, resources and services for social scientists working in this new era of social science research. The aim of the innovation incubator was to use lean product development methods to identify researchers’ needs and develop new products to meet those needs.

After conducting market research, we found that many social scientists face a skills gap which must be overcome in order to feel confident working with big data in their own research. For faculty and early career researchers, flexible online learning which can be fitted in around the demands of an academic role is seen as an attractive option for professional development. To meet this self-reported need, we developed SAGE Campus, a series of online courses that equip social scientists with data science and computational skills.
SAGE Campus courses cover the following skill areas in social research and data science:

- Text mining
- Quantitative text analysis
- Data visualisation
- Programming in R and Python
- Data management with R

Using lean methods to develop SAGE Campus

The SAGE team used lean product development methods to develop SAGE Campus. We partnered with ThoughtWorks, a leading technology consultancy, to embed the lean discovery framework into our practices.

The primary aim of taking a lean approach to product development is to increase value for customers while minimizing waste. This means getting early feedback from potential users and reducing the cycle time between decisions. The lean discovery framework promotes a systematic, data driven approach to testing new ideas. The process is cyclical and its focus is on learning. By defining strategic goals, hypothesizing solutions in the form of products or initiatives, and testing the riskiest assumptions you’re making about your product idea with real customers and users, you learn quickly if an opportunity is worth pursuing. Based on what was learned through running lean experiments, the team returned to the product and strategic levels and assessed how the strategy might need to change in light of the test data. In some cases this meant adjusting the approach, pivoting, or moving away from initiatives and ideas altogether.
Creating a lean canvas and designing lean experiments

One of the tools the team used in the early stages of developing the SAGE Campus product was the Lean Canvas, Ash Maurya’s adaptation of the Business Model Canvas by Alexander Osterwalder. The purpose of the tool is to allow teams to quickly build a business plan for a potential new product by answering critical questions such as: What is the problem your product is solving? Who are your customer segments? What channels will you use to reach them? What’s your unfair advantage and unique value proposition?

When preparing a Lean Canvas for a new idea, many of the statements included in the canvas will be assumptions which have not yet been tested. The next stage is to identify the most critical assumptions; those which, if wrong, could kill your product’s value proposition or business model. By identifying the riskiest assumptions in our canvas, the team were able to design quick, lean experiments to test those assumptions before moving onto the next stage of product development.
In our canvas for a new online learning product teaching data science skills to social scientists, the most critical assumptions which required testing were:

- Our potential customers (social science faculty, early career researchers and PhD students) were unhappy with the existing alternatives and would choose our solution if we tailored our courses to social scientists.
- There are enough social scientists who want to learn data science skills to create a sustainable business, and that we would be able to reach them through our available marketing channels.

To test these assumptions, the team ran a number of quick experiments. First, we contacted a number of academics and students asking about their satisfaction with existing online courses, most of which are not tailored to social scientists. We wanted to uncover whether there was appetite among social scientists for courses where the examples, datasets and topics covered were tailored to their needs. The responses to our survey supported the assumption that social scientists would prefer to take courses which were tailored specifically to their needs, from an academic publishing provider whose brand they trusted, which became SAGE Campus’s first unique selling point.

Secondly, to test the appetite for our offering and to estimate the potential size of the market and SAGE’s ability to reach it, the team designed a landing page experiment (a common tool used in lean product development to test the appetite for a new product or service before building the product). Using a service called Launchrock, the team constructed a simple webpage communicating our value proposition. We then emailed a subset of our mailing list of social scientists to determine whether they would register their interest to receive more information about a series of online courses from SAGE teaching data science skills to social scientists. This experiment showed that there was indeed an appetite for online courses tailored to social scientists from SAGE.
Finally, we used the Customer Factory Model from Ash Maurya’s book Scaling Lean to help us to challenge our assumptions around our business model. This framework is also known as ‘Pirate Metrics’ and was developed by Dave McClure from 500 Startups. Pirate metrics is a way of categorizing different metrics and KPIs, and is made up of the metric ‘categories’: Awareness, Acquisition, Activation, Revenue, Retention, Referral — or AAARRR for short.

**Developing successful online learning content**

Having validated our idea - online courses teaching data science skills to social scientists, the team then had to develop a plan for commissioning and building our first online courses.

This was done by:

- Conducting numerous interviews with researchers from the social science community to identify key topics that were particularly in demand. These including data visualisation, R and Python programming.
- For our first courses, we partnered with leading institutions including The Royal Statistical Society, The Essex Summer School at the University of Essex and The Social Science Data Lab (D-Lab) at the University of California, to translate successful face-to-face training courses into online learning.
- Matching our instructors and experts with experienced instructional designers to translate the instructors’ material into effective online learning, and developing processes for reviewing our course content.
- Choosing a Learning Management System to meet our needs. We chose Moodle, an open source LMS and one of the most widely-adopted systems worldwide, with over 60 million users.

**Designing for diverse learner groups**

To ensure that the courses we built would meet the diverse needs of our audience of postgraduate students, early career researchers and faculty from across the social sciences, we involved social science academic experts at every stage of course creation, from creating a syllabus, to writing and developing the content, to reviewing the course at each phase of the design. This collaboration with social science experts ensured that the course content, datasets, examples, and language used were tailored to social scientists.

To build SAGE Campus courses, we adopted the ADDIE model of instructional design (Analysis, Design, Development, Implementation and Evaluation – shown in Figure 6). This model has much in common with lean product development methods in its focus on collecting data throughout the development process in order to constantly iterate and refine your course in line with learners’ goals.
To ensure the quality of the material matched that of all of SAGE’s products, SAGE introduced review processes throughout course development. Content was reviewed three times during the process (during the initial course design phase, the authoring phase and the final delivery stage). All SAGE Campus courses were reviewed with social science academic experts, e-learning experts, and prospective learners.

Through the SAGE Campus website, prospective learners were provided with details on the course aims and content, as well as the prior knowledge and experience required to take each course - an important part of setting learners up for success. The courses were designed with diverse learner knowledge and skills in mind and used a varied range of examples and scenarios to build on learners’ existing knowledge. Forums are used to encourage students to learn from each other through peer to peer learning.

**Structuring and sequencing course content**

This is one of the most important aspects of designing any learning experience, and is especially important when developing online learning.

The concept of scaffolding, first introduced in the late 1950s by cognitive psychologist Jerome Bruner, is an immensely powerful and effective construct when building successful online learning. It is geared around helping your learners to learn by structuring the experience in a way that will help them to achieve a learning objective. Scaffolding involves reducing the choices the learner might face, so that they focus solely on acquiring the knowledge or skill that is required. In practice this can involve providing sufficient support to promote learning when concepts and skills are being first introduced, and gradually reducing this support as learner skills and confidence develop. In the case of online learning, these supports may include links to additional resources, templates and guides. Instructional scaffolding in online learning can be employed through modeling a task for a learner prior to the learner being asked to complete the task themselves.

Scaffolding is especially important in online learning as the learner not only has to contend with the challenge of learning something new, but also deal with the technology and User Interface (UI) of an online learning platform. The following design principles, adopted by the SAGE Campus course design team, may be helpful when applying scaffolding principles:
1. Ensure that courses have a clearly explained structure that is easy for the learner to understand and navigate. If course designers have to spend a lot of time explaining user interface elements to learners, the experience is going to be extremely challenging for learners with limited experience in online learning. Make the course the ‘Google Maps’ of online learning: easy to understand and start using. This also applies to the user experience of the platform and course, which should follow usability User Experience (UX) and UI best practice principles.

2. Scaffold and structure content and tasks so that learners can progressively build competence. Content should be structured so that it is easy for the learner to understand why it matters and what it is about. Complex tasks can be broken up into a number of stages with each stage having rich feedback. In the SAGE Campus courses, learners receive feedback throughout through quizzes and activities which consolidate learning. As the learner progresses and builds competence the number of stages can be reduced. In other words, the scaffolding is gradually removed.

3. Think about employing both synchronous and asynchronous elements in your course to allow for flexible learning, but with some real-time interactions with instructors who can provide further instructional scaffolding through coaching and feedback.

**Promoting learning through the use of data**

When designing online learning, it’s important to remember that learners are taking courses to build competencies. In the case of social research methods and data science courses, these competencies are often related to the ability to collect, manage, analyse or interpret data. Learners aren’t online to do the course per se, they are there to quickly develop the skills and behaviours they need to perform certain tasks with their data.

In SAGE Campus courses, learners are provided with real datasets to work with, with the goal of enabling learners to competently perform and master the tasks they have set out to learn. As much as possible, the aim has been to produce activities and exercises which are an approximation of what the learner will likely perform when they are back at their desk, doing their own academic research. When designing online learning there should be a wide range of tasks in the course to test for the development of knowledge, skills, and attitude among learners. The online learning space should create an opportunity for learners to safely practice and develop competence. It’s a chance to learn, try, fail and then succeed.

**Translating in-person training material to online**

One of the benefits of creating online courses is the potential to reach those who cannot practically attend classroom sessions due to location or timing, or those who prefer a self-paced learning journey. In order to reach these learners, several SAGE Campus courses have been translated from successful in-person training material into online courses.

Translating in-person material comes with both benefits and challenges. The primary challenge when translating face-to-face courses into an online setting is establishing how the content and style will work in the new environment. Experiencing the subject being taught in a live setting is a great first step that can help the online course designer to learn about the subject’s language, tone and structure, and to identify the elements which can be translated into the online space.

One key difference when translating live teaching into online delivery relates to how, in a live classroom setting, the instructor may improvise or change the pace in response to learners’ needs. In contrast, online tools necessitate that the pacing and content be established from the outset and maintained throughout. This can be a huge challenge when developing a course from scratch, but is made easier when refining and translating from existing teaching materials given by an experienced instructor.
Designing useful and invigorating assignments fit for the online environment is a crucial part of the pedagogical offering. Classroom exercises that would normally encourage conversation and debate are redesigned to become online activities that are bolstered with clear instructions and explicit aims.

To overcome the barriers of teaching in an online environment it can be helpful to deliver video presentations to an imagined, representative persona to focus the presentation style. This enables the course instructor to find a delivery style that is more likely to connect with the learners. Communication can also be enhanced in the online environment with the availability of course forums and social media, so that communication becomes a dialogue rather than a monologue.

When designing online courses it’s important to find the right balance between delivering too much and delivering too little. The topics can be complex multidisciplinary subjects and as a result are challenging to cover in sufficient detail in fixed-duration video recordings. To overcome this, it’s essential that the core content imparts immediately useful and practical knowledge, and can work alongside frameworks of thinking that encourage self-directed external learning.

**Ten tips for designing effective online learning**

In addition to designing for diverse learners, structuring and sequencing course content and promoting learning through the use of data, the SAGE Campus team and instructional designers have produced a list of ten top tips for designing online learning, based on our experience.

1. **Make it practical and interactive:** We aim to bring the course content to life by displaying the real-world applicability of learners’ newly gained skills. Our courses are interactive and practical, offering learners the opportunity to practice the skills they’re learning during the course and apply them straight away to their individual research activities.

2. **Make your online learning a resource:** Make the course well-structured, helpful and engaging enough for a learner to consider revisiting it if needed. Try and keep specific topics and concepts to a single screen or page. This is easier now that most modern online learning tools replicate responsive web pages. Implement a robust search feature so that it is easy for a learner to find specific content, and provide some downloadable content that can serve as tips or a simple job aid, and as a friendly call to action for the learner to return to the course for more detailed support.

3. **Keep the learning times manageable:** Our syllabi are intended to be of a manageable length for busy people. Learners have access to the course for 3 months so that their learning can fit around schedules and workload.

4. **Make assessments and experiment based on data:** We regularly review customer behaviour and feedback and update our courses iteratively in line with learner feedback.

5. **Stay learner-focused:** Don’t forget to think about the learner first and foremost whenever you’re creating content. Putting ourselves in our learners’ shoes and thinking about how they will interact with the platform has resulted in positive feedback about the ease with which learners can navigate through our courses, thanks to the clear and detailed instructions and explanations.

6. **Motivate your learners:** Keeping learners motivated is a key consideration when creating effective online learning. Learner interaction can be delivered through course design, through the LMS, and directly via email.

7. **Engage with your learners:** When selecting an interaction channel, choose a method that suits your learners. For SAGE Campus, it was important to have a method for reaching learners who have not accessed the platform for some time, as well as those who actively taking the course. For this reason, we chose to create an email engagement plan. It is important to communicate frequently, but not excessively. During the course, emails should communicate key dates, such as when access to the course material ends. It is beneficial to motivate those who are struggling in the final month of the course by sending personalized messages to learners, the content of which is dependent on how much of the course is left to complete.
8. **Innovate:** Engagement should constantly evolve and improve, and there are many ways to engage learners, such as gamification, badges, animations and gifs.

9. **Help learners complete:** We want our learners to gain the skills they signed up to learn. We understand that it’s difficult to fit online courses into busy schedules, so if we see that a learner is struggling to complete we offer extensions to give them a helping hand in getting to the finish line.

10. **Consider what course completion means to your customer:** Even if your learners haven’t ticked off every exercise or module in the course, they may have gained the skills that they set out to learn. To ensure that learners can still ‘graduate’ from the course, we provide the opportunity in our email engagement plan for learners to tell us that they consider themselves to have completed the course.

### SAGE Campus online data science courses for social scientists

To find out about the full range of online courses available on SAGE Campus, please visit campus.sagepub.com. If you are interested in joining a course you can enrol directly on the website. If you are an institution or organisation and wish to provide online training for a group of learners, please contact us via the SAGE Campus website and we will discuss delivery and enrolment options with you.

We frequently have courses in development, so if you do not see the course of your choice on offer, it could be coming soon. Please contact us directly or join our notification list and we will keep you informed about our upcoming courses.

If there are any topics that were covered in this white paper that you would like to discuss further, you can contact the SAGE Campus team at campus.info@sagepub.com.
References


https://www.dataschool.io/teaching-data-science/


