

Academic collaboration within the SimDH programme - guidance

Businesses applying to the SimDH programme have the option of additionally applying to collaborate with London South Bank University academics from the Schools of Applied Sciences, Business, or Engineering. The scope of this project should aim to develop, evaluate or launch a new product or service to the market or to your business.

Product development

LSBU's School of Engineering can offer support in the development of digital or physical products through our expertise in Computer Science, Data Science, Mechanical Engineering, Electrical Engineering and Design. This can include academic consultancy on technical development strategy, or opportunities for Undergraduate or Masters students in relevant disciplines to deliver projects developing or iterating your product as part of their course or via a paid opportunity funded by SimDH.

Conducting product evaluations and testing

Background on testing

Product evaluation is conducted for reasons including to develop the product itself or to examine the effectiveness of the product. In addition, for businesses seeking to achieve regulatory approval, evidence of evaluation will be required. Evaluation should therefore be considered as an important factor in the cycle of product development.

Testing may occur before the product has been launched to market. It allows you to examine the feasibility and usability of the product and any problems encountered with its use. This informs the development of the final product before it is launched to market. Once the product has been launched, evaluation can be conducted to identify how effective the product or service is. The approach taken to evaluate the product may be informed by the findings of a pilot.

Testing with London South Bank University on the SimDH programme

Businesses that are engaged in academic collaboration can receive support in the development of their product. This may be through support with software or hardware development, or through research projects. SimDH programme outputs require a new product, process or service to be brought to market or to the business. As such, research projects can be on a prototype to help launch a product to market. Alternatively, projects can be on products that are already launched to market. This can establish the effectiveness of the product amongst its target market. In so doing, it enables the business to develop the product further, thus new functionality creating a new version of a product or service to the business.

It is important to note that while your aim may be to gather evidence of your product's effectiveness, this is not guaranteed. Through evaluation, the results may not demonstrate a significant effect of the product or may in fact demonstrate a negative effect. As such, it is important to be aware of the inherent risks of evaluation before entering into it.

Types of Evaluation

Please find below an outline of the different types of approach to evaluation and examples of when they would be used.

Acceptability and feasibility

Acceptability/ feasibility studies may occur early in the development cycle. They are smaller scale and seek to establish whether the intervention is possible to roll out and if people will use the intervention (feasibility). Additionally, it can establish what the target audience think about the product, including whether they think it would meet their needs (acceptability).

Proof of concept / principle

A proof of concept/ principle study is one which aims to demonstrate the validity of the technology or product in order to inform its further development. The product may be an

early iteration but should have sufficient functionality to test the core principles underlying it.

Product testing

Product testing as a general term encompasses research designed to examine the effectiveness of the product in achieving its intended outcomes. It involves recruiting a sample of users from the target audience and providing them with the product. Then, associated outcomes are measured using a predetermined schedule of metrics. Often, outcomes in users are compared to a sample of control participants who do not receive the product. To engage in product testing, the product must be developed to at least MVP stage.

Service evaluation

The purpose of a service evaluation is assessing how well a product or service achieves its intended aims. Its' focus is specifically on the current conditions of the product or service and does not make comparisons between alternatives. A service evaluation requires the independent evaluation of outcome data collected through the routine delivery of the product or intervention. Therefore, service evaluations can only be conducted on interventions that are already launched.

Qualitative studies

Qualitative research provides in depth insight into the experience of a small group. In product evaluation this could mean a small group of users provide insight into their experience with using the product; how they found the journey of product use and any suggestions for improving the product.

Research design

Theoretical rationale

A theoretical rationale in research design is the background to the current research. It outlines the research that has already been conducted in the area, whilst demonstrating what is yet to be understood. By doing so, it introduces the outcomes to be measured in the research project and explains the justification for doing so. When product testing, the

background for the research also includes the theoretical background of the product. Is there a theoretical framework that underlies the product such as mindfulness or the theory of planned behaviour? Is there an existing evidence base on which the product was built? Importantly, what is the novel addition of the product to this evidence base?

Research question

A research question is the specific question you are attempting to answer through engaging in a research project. Put simply, it is what you want to find out about your product or business by engaging in research. This question may be refined through scoping meetings with academics, but it is important for you to come up with the initial research question that you are looking to answer.

Participants

Your participants are the group of people you would want to recruit to take part in testing. It is important to consider who your participant group would be. If your product or business has a target audience, it is reasonable to assume that it would be most beneficial to engage in product testing on this group. In addition to identifying who the most appropriate participant group is, when designing a research study, it is important to consider how many participants the project will need. When conducting quantitative research, the aim is to test for statistical significance. This means an effect that is likely not to have been caused by chance. In order to be able to establish this, the study needs sufficient participants. The number of participants needed to be able to detect an effect *if there is one* is typically determined by a power analysis and is informed by the type of research design used.

Measures

When conducting research, it is important to consider the data you will need to generate the evidence you are looking for. Does your product collect data through its routine delivery that will provide outcome evidence? Or are additional measures needed? If so, what existing metrics are there that measure the concept of interest? It is preferable to use existing metrics as these have been validated. That is, they have been shown to measure what they claim to measure.

Duration

Depending on the research question, a research project may consist of single testing sessions (in which participants are only required to engage at one time point) such as focus groups, or multiple testing sessions (where participants are required to attend multiple testing sessions or complete multiple follow up surveys). If the research aims to test whether a product causes a change over time, participants are required to complete measures at more than one time point so that participants' scores can be compared across time points. This enables us to determine whether change has occurred.

Ethics

Any research study involving human participants is required to be approved by the university ethics panel before data collection can commence. Ethical approval is required to ensure that the procedures to be used conform to the university's ethics regulations. It ensures the research team have considered any relevant risks and how to mitigate them and the data security and confidentiality of participants. University ethical approval takes approximately 6 weeks.

Research projects that are proposed to take place within the NHS will need to go through additional HRA approval. Please be aware that this process takes around 6-9 months. In determining whether your proposed project is classed as 'research' which requires HRA ethical approval, this [decision tool](#) can be used.

Research methods

Whilst there are different approaches to evaluation, there are also different research methods that may be used for evaluation.

Randomised controlled trial

An RCT is a rigorous experimental approach. Participants are randomly allocated to receive either the product or service or an alternative. The alternative may be nothing or a placebo. Both groups are then compared on a pre- determined outcome measure.

A/B testing

A/B testing tests two iterations or versions of a product or service. Participants are randomly assigned to experience one version of the product or service, and both groups are then compared for their effectiveness.

Focus groups

A focus group is a qualitative methodological approach. A group or several groups are assembled based upon their specific criteria. They then engage in a moderated discussion about the product or service and their experience of using it.

Interviews

Interviews are also a qualitative methodological approach. Conducted face to face or online/ over the phone, interviews require the researcher to ask an individual participant a series of questions. The questions will be determined ahead of time in the form of an *interview schedule*. A structured interview follows the interview schedule in a question-and-answer approach. Whilst a Semi- structured interview uses a series of open- ended questions but allows the participant the freedom to bring up new ideas or concepts that the interviewer had not included in the interview schedule.

Before and after study

Before and after studies compare a group of participants on a measured outcome before and after a product or intervention has been introduced. This type of study examines the change in the participant group on a specific outcome measure after the introduction of the product intervention.

Directory of terms

Please find below a list of terminology that are used when talking about and designing research projects.

Control condition

In an experiment, a control condition is one in which participants do not receive the experimental manipulation. Therefore, when measures are taken from this condition, they

are used to compare to those from participants' who have received the experimental manipulation, in order to compare.

Design

The research design refers to the strategy used to answer the research question. It includes factors like what the experimental 'conditions' are and whether your sample of participants would be assigned to one of the conditions or all of them. The research design used will depend on the question being answered.

Ethics

All research projects involving participants are required to have ethical approval from the university prior to data collection commencing. This ensures that any risks to participants from participating in the research have been considered. Ethical approval also covers the use of participant data and confidentiality. Certain projects will require enhanced approval, for instance if they are hoping to recruit participants from vulnerable participant groups.

Hypothesis(es)

A precise, testable statement about the expected outcome of a piece of research.

Outcomes

The outcome(s) refer to the expected effect or change that will occur as a result of the product or service being provided. This should be clearly defined in a way that makes it possible to measure.

Participants

These are the sample of the population who will take part in the study. The sample chosen should be appropriate for the research question under study. For instance, if the service or product is aimed at a specific target audience, the sample used to test the product should consist of members of the target audience.

Procedure

The study procedure refers to the specific steps involved in conducting the study. It provides a detailed outline of the experience of taking part in the study. This includes any relevant materials that are needed to measure the outcomes, and a timeline of the study duration.

Research Question

This is the question that the piece of research you are conducting aims to answer.



Resources

- [Evidence standards framework for digital health technologies](#)
- [NHS Digital Technology Assessment Criteria \(DTAC\)](#)