Online Learning for Students with Limited ICT Access and Skills

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MASTER THESIS

HELP to HELP

Online Learning for Students with Limited ICT Access and Skills

A case study in Tanzania

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Abstract

Education is by the UN stated to be the foundation to creating sustainable development. Lately, there has been a tremendous increase in the use of information and communications technology (ICT) for educational purposes worldwide, but as many countries lag behind both in terms of uptake and usage of ICT, this limits their populations' chances to participate. Given this, the aim of this thesis was to investigate and evaluate factors affecting the usage of online learning amongst university students in Tanzania with limited ICT access and skills. The study also aimed to explore the objectives, opportunities, and challenges for these students to pursue online learning.

The study, performed in collaboration with the Swedish-Tanzanian NGO Help to Help, can be divided into two parts: First, a pre study consisting of a thorough literature review and interviews with field experts. Secondly, a single case study, including a questionnaire and qualitative interviews, with university students attending the Help to Help Academy program.

Overall, 57 factors affecting online learning were identified and investigated. In general, the Tanzanian students expressed great interest in using online learning with the main objective being increased access to material and courses. An important insight was that when initiating online learning it is important to not take things for granted and be attentive of the target group. Learning is an individual experience and the key to succeed, both online and offline, is to understand the group that is supposed to learn.

The findings of this study contribute to online learning theory by elaborating on the evolution and definition of online learning. In addition, the findings contribute to digital literacy theory by evolving on the digital setting in Tanzania for urban students. Finally, this study shows that online learning is a great source of potential to ensure quality education for all, but that there is a need for more user-centered studies and contextualized online learning platforms.

Key words: Online Learning, Tanzania, Information and Communications Technology, Digital Development, Skills Gap

Sammanfattning

Utbildning är enligt FN grunden till att skapa hållbar utveckling. Under de senaste årtiondena har det globalt skett en stor ökning i användandet av informations- och kommunikationsteknologier (IKT) i utbildningssyfte, men eftersom flera länder ligger efter i sin digitala utveckling så begränsas deras befolkning från att ta del av den möjligheten. Givet detta var målet med den här studien att undersöka och utvärdera faktorer som påverkar användandet av onlineutbildning bland universitetsstudenter med begränsad kunskap av och tillgång till teknik i Tanzania. Studien syftade även till att utforska vilka mål, möjligheter och utmaningar som finns kopplade till onlineutbildning för de här studenterna.

Studien, vilken utfördes i samarbete med den svensk-tanzaniska organisationen Help to Help, kan delas upp i två delar: En förstudie bestående av en litteraturstudie och intervjuer med experter inom området respektive en fallstudie bestående av ett frågeformulär och kvalitativa intervjuer med studenter som deltagit vid Help to Helps Academy program.

I helhet identifierades och studerades 57 faktorer som påverkar användandet av onlineutbildning. Studenterna som deltog i studien uttryckte generellt ett stort intresse för att börja använda onlineutbildning, framför allt för att det skulle ge dem större tillgång till utbildningsmaterial och kurser. En betydelsefull insikt var att vid införandet av onlineutbildning är det viktigt att inte ta saker för givet och att uppmärksamma användarna. Det är viktigt att inse att lärande är individuellt och att nyckeln till att lyckas, såväl online som offline, är att förstå de individer som ska lära sig och anpassa upplevelsen utefter det de behöver och önskar.

Studien bidrar till teori om onlineutbildning med sin utredning av hur onlineutbildningen har utvecklats samt en diskussion kring definitionen av onlineutbildning. Vidare bidrar resultaten till teori om digital kompetens med förtydligandet av hur den digitala miljön ser ut för studenter i stadsmiljö i Tanzania. Slutligen visar den här studien på att onlineutbildning är en viktig del i att säkerställa kvalitativ utbildning för alla, men att det behövs fler studier med användaren i fokus och fler kontextualiserade plattformar för onlineutbildning.

Nyckelord: Onlineutbildning, Tanzania, Information- och kommunikationsteknologier, Digital Utveckling, Kompetensgapet

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We further want to thank all the participants of our pre study and case study. Your contribution is what has shaped this thesis and your insights are at the center of our results. An extra thank you to Lars Peterstrand, Senior Business Developer at Learnifier, for giving us permission to use your educational platform in our case study. This was a great asset and something we really appreciated.

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Lund, June 2020

Isabella Bergvik and Sofia Johansson

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List of Acronyms & Abbreviations

AHP	Analytic Hierarchy Process
COO	chief operating officer
GDD	gender digital divide
GDP	gross domestic product
HEIs	higher educational institutions
ICT	information and communications technology
IT	information technology
LAN	local area network
LMS	learning management system
MOOC	massive open online courses
SSA	Sub-Saharan Africa
TAM	Technology Acceptance Model
TGEE	Technology for Gender Empowerment and Employability
UDSM	University of Dar es Salaam

1.Introduction

This chapter aims to introduce the topic of the master thesis by presenting essential background information and the issue of study. Moreover, the research questions are stated as well as the delimitations of the thesis.

1.1 Background

The fourth UN Sustainable Development Goals is to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all", (United Nations [UN], 2020). The impact of education is extensive as it not only empowers individuals, giving them access to higher income, but also supports communities and brings last change on a national level, (UN, 2020; Aksentijević & Ježić, 2019). Still, access to education is limited, particularly in Africa where only about 6 percent of the population have access to higher education compared to 45 percent in Europe respectively North America, (Mapitsa, Khumalo, Engel & Wooldridge, 2019). Moreover, 65,2 percent in Africa are educationally mismatched with the labor market, affecting the economic, social and cultural capital. What if education online could help solve this problem?

Many claims that information and communications technology, ICT, is the future of education. Education online allows for new types of learning environments and overcomes many of the educational barriers present today, (Koponen, Tedre & Vesisenaho, 2011). However, in many countries a digital divide is present, which means that these nations lag behind both in uptake and usage of ICT, (Baelden & Van Audenhov, 2015). How can you implement online learning for those affected by the digital divide? This is what this master thesis aims to investigate.

1.1.1 Introduction to Help to Help

This thesis was performed in collaboration with the organization Help to Help. Help to Help, funded in 2010, is an organization that, through crowdfunding, works towards fostering educational access and bridging the skills gap. They execute two different programs in Eastern Africa; a Scholarship Program and an Academy

program. Their target group consists of young students and recent graduates between the ages of 18 to 30, (Cronqvist, Askne & Nyström, 2019)

The Scholarship Program involves offering scholarships to university students in Tanzania, Uganda and recently also in Kenya. The target group for the Scholarship Program are young students who want to study at university level but lack the means to do so. Help to Help's view is that the power of educating a population to help themselves is more effective than contributing with external expertise during a limited time, which was the idea behind the Scholarship Program, (Cronqvist et al., 2019).

The Help to Help Academy program was started in 2013 with the aim to bridge the distance to the labor market, since many graduates have issues finding related work. The program includes activities such as CV-workshops, courses in entrepreneurship, leadership and equality, company visits and ICT-initiatives, (Cronqvist et al., 2019).

As Luthman (2019), chief operating officer (COO) at Help to Help stated, the organization is today receiving far more applications than they can accept for both their Scholarship program and their Academy program. To handle this growth the organization believes they need to find new ways of working. A possibility of expansion is to start using online learning since it enables scaling up the business in the future and requires less resources. However, there are challenges with introducing online learning for their target group, for example limitations in ICT knowledge and physical access to ICT. As a step in this process, Help to Help initiated this thesis in collaboration with the authors, (Luthman, 2019).

1.1.2 Issue of Study

Help to Help's aim is to implement blended learning for their Academy Program meaning that their physical courses would be followed by online education. As of now, they only have one follow up activity for their program courses, which is a physical gathering. Unfortunately, it has a significantly lower turnout than the actual course. This limits the possibility of following up the students' obtained knowledge, as well as limits the possibility to collect statistics for evaluating purposes. In addition, this means a great cost for Help to Help without fulfilling its full potential. Help to Help hence wanted the authors to investigate how their follow up activities could be performed online.

In the long haul, this can contribute to developing full online learning solutions for Help to Help, which can enable them to scale up and educate beyond their current capacity. As the COO of Help to Help stated: "Even if online learning only can provide one third of the gain our Academy students get today, it is still more than getting nothing", (Luthman, 2020a). The identification of important parameters for

creating online learning in this context can also in a greater perspective contribute to academic evidence.

Interpretation of the target groups' ICT circumstances

The authors addressed this thesis with the idea that Help to Help's students in Tanzania, and hence the target group of this study, has limited ICT access and skills. This was interpreted as them not having internet access everywhere, having unstable electricity power and not having access to the latest technology. Moreover, their digital literacy was also considered lower than the average digital literacy in more developed countries. This as they were not believed to have the same exposure and experience with technology. This was based on the information given by Help to Help as well as literature on the ICT situation in Tanzania, such as the information provided by the Central Intelligence Agency, CIA, (2020).

1.2 Purpose

The purpose of this thesis was to investigate and evaluate factors that are important for the usage of online learning amongst university students with limited ICT access and skills in Tanzania. Further, this study aimed to investigate how these factors preferably should be formed for the target group. This also included determining if there are parameters, and in that case which, that are more important when initiating an online learning platform in this context.

1.2.1 Research Questions

In this thesis, two main research questions were addressed:

1. Which are the main drivers for creating a successful online learning platform[1]?

2. What would make university students in Tanzania use online learning?

[1] Successful online learning platform is by the authors considered to be a platform that the users regularly revisits.

1.3 Delimitations

- The study focuses primarily on urban men and women in Tanzania
- The study focuses on university students with previous experience from Help to Help, the case organization

1.4 Effect of the COVID-19 Pandemic

During the time frame of this thesis the pandemic of the coronavirus, COVID-19, affected the execution of the case study. Travel restrictions to all countries were announced by the Ministry for Foreign Affairs, which prevented the authors from travelling to Tanzania to execute the case study as planned. This was handled by adjusting the execution of the case study, further explained in section *5.2. Case Study Design*. In short, observations and workshops were cancelled, and interviews instead conducted online through Google Hangouts with assistance from Help to Help staff in Tanzania.

This situation, and the methods the authors had to use in order to proceed with the thesis, emphasizes the importance of ICT-access and online learning. In addition, the students from the target group got an opportunity to conduct these activities online which itself became a test of their adaptability.

2. Methodology

This chapter describes the methodology used in order to give transparency to the work process of this thesis. The chosen research strategy and design is stated and discussed. Further, the methodological theory and practical implementation that has been used in this study is presented. The chapter ends with sections addressing ethical aspects and the credibility of the research.

2.1 Research Strategy

This section describes the chosen research strategy of this thesis, which includes presenting the research design and research approach as well as the methodological approach.

2.1.1 Research Design

The research design of this study consisted of four main phases: a literature review, a pre study, a case study and finally an analysis of the results, see figure 2.1.

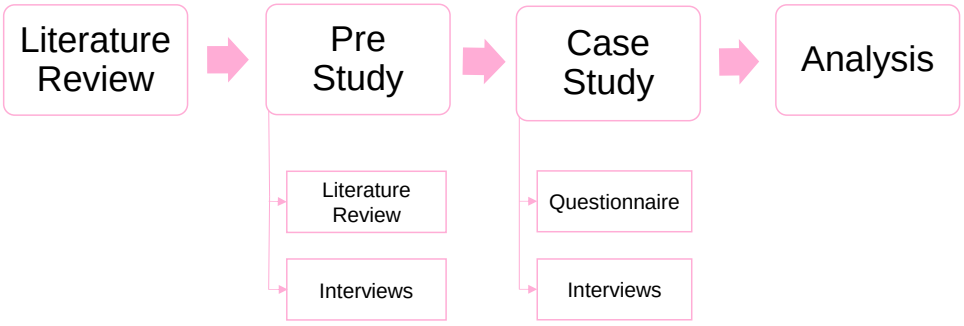

Figure 2.1. An overview of the research design of this thesis
Illustration by authors.

The main research design strategy chosen for this thesis was a case study, since the aim was to explore and understand a complex issue in its real world setting for a defined target group. This is what defines a case study and makes it distinctive from other experimental studies, (Wedawatta, Ingirige & Amaratunga, 2011; Creswell &

Poth, 2018; Harrison, Birks, Franklin & Mills, 2017). The case study was supported by, and based on, the literature review and pre study. Further, the results of the case study served as the basis for the analysis, which had the purpose of answering the research questions.

A case study approach is usually used for small-scale projects that aims to go deep rather than broad, rely on multiple sources and benefit from prior research and development to guide the data collection and analysis, (Wedawatta et al., 2011; Creswell & Poth, 2018; Gaya, 2016). When studying one specific unit or group, Gustafsson (2017) states that a single case study should be the primary choice. A single case study is a more thorough, careful study that gives a deeper understanding and enables questioning old theoretical relationships and exploring new ones rather than focusing on comparisons, (Gustafsson, 2017). Due to the nature of the research questions and the uniqueness of the context, which was investigated in this study, a single case study design was used.

2.1.2 Research Approach

The research approach used in this thesis followed an abductive logical reasoning form, which Chaiter and Heit (2011) means is a combination of inductive and deductive reasoning. Inductive reasoning refers to an empirical method where generalized rules are derived from observed cases. Deductive research on the other hand starts from theory and is validated through testing, (Chaiter & Heit, 2011). This study involved identifying parameters in the data, where an inductive method was most useful. Further, the study used these to validate and investigate the importance of these parameters in the context of the target group, where a more deductive approach was appropriate.

According to Park and Park (2016) there are two main ways of analyzing and approaching research: qualitatively or quantitatively. Qualitative research has the goal to understand and explore a subject by conducting research in natural conditions. The approach is non-numerical, observational and interpretational. Quantitative research uses hypothesis testing and strives to identify and isolate variables and correlations within the context of the study. The method emphasizes numerical data and measurable variables, (Park & Park, 2016). In this study, a mixed methods approach was used, which refers to the combination of quantitative and qualitative data collection methods, (Denscombe, 2017). More specifically, quantitative research was used to analyze and build up a second, qualitative phase, (Ayoub, Wallace & Zepeda-Millán, 2014). This was considered appropriate as the issue of study was unexplored. There was therefore a need for a broad investigation at first in order to later conduct a precise case study.

Triangulation, as stated by Ayoub et al. (2014), refers to the combination of sources or theoretical frameworks to confirm a theory from different angles. This reflects the approach of this thesis as a combination of approaches is used and data is

collected from several sources. Triangulation gives a holistic view of a complex phenomenon and works as both a validating strategy and as an approach for deeper understanding, (Ayoub et al., 2014). The area of ICT education and computer literacy[2] for men and women in Tanzania is an emerging field of knowledge with limited previous research, which also emphasizes the need for triangulation to validate the results.

2.1.3 Methodological Approach

A research study can, as reported by Park and Park (2016), have two different purposes in its methodological approach: discovery or justification. Discovery includes reviewing and assessing previous research. This is done to develop concepts and methods to further collect sufficient data, analyze it and conclude the discovered results. A justification study focuses more on evaluating results through a validation process, generalizing research and controlling and explaining activities and concepts. The nature of qualitative research is situational and curious which makes it adapted for a discovery approach. Quantitative research on the other hand is more testing oriented and is hence compatible with the justification approach, (Park & Park, 2016).

The purpose of this thesis and its approach was mainly discovery oriented since the qualitative aspect of the research approach was in focus. This because the thesis aimed to understand a subject in a deeper sense and investigate to be able to analyze and draw conclusions on the discovered results.

2.2 Data Collection

The data collection of this study included a thorough literature review and a pre study to construct the base for the case study. Further, in the case study, data was collected through a mixed methods approach involving a questionnaire and qualitative interviews as presented below.

[2] Computer literacy, synonym with digital literacy and technical literacy, refers to the knowledge and ability to utilize capabilities of computers and related technology efficiently, with a range of skills covering levels from elementary use to computer programming, (Tobin, 1983).

2.2.1 Literature Review

A literature review has the purpose of iteratively reviewing existing material on a topic to be able to build current research on previous research, instead of investigating the same things that have been previously done. Further, the literature review aims to give insight to how previous research relates to the research in question. More specifically, how it gives rise to the particular issues and problems that the research aims to address, (Denscombe, 2017).

This study was initiated with a literature review on the Digital Divide, ICT development in Tanzania respectively Eastern Africa and the overall Sub-Saharan African (SSA) context. This to create an understanding of the problem and context of the study. Further, literature on online learning, blended learning and ICT platforms was collected to address the upbringing, challenges and requirements with implementing and using it. Moreover, literature on scientific methodology was studied to validate the methods chosen in this study.

The sources used for the literature study were mainly found through Lund University's database LUBsearch as well as through Google Scholar. The keywords that were used were primarily: Online Learning, Blended Learning, Tanzania, ICT Development and ICT platforms. These keywords were refined and combined to focus the research on the integration between these aspects. The keywords were also detailed further as the process proceeded to match gaps in the literature collected and to focus the research on university students in Tanzania. The articles, books and academic journals used in this thesis were mainly published by trustworthy institutions and authors. All academic articles were peer reviewed, which was an important requirement when selecting literature. References such as data banks or websites, were used carefully. These facts did not have any crucial influence on the results or conclusions of the study and their relevance and trustworthiness were always considered.

The authors of this thesis made an effort to find the most recent literature, however some research articles or other sources in this study are several years old which can be a threat to the relevance of the results. In those cases, this literature was used with the understanding that the area of ICT development and online learning is emerging and that this data might not be representative of the present situation. However, as most crucial data used is recently published, the overall timely relevance of this study is considered sufficient.

2.2.1 Pre Study

A pre study can be conducted to establish a better foundation for the research. A pre study is characterized by theorizing on empirical data (from for example a literature study). Further, an analysis of the previous research on the subject should be made

and finally an analysis by the researchers on how to use this knowledge to proceed with the research project, (Swedberg 2012).

In this thesis, a pre study was conducted to identify and categorize parameters that could be considered important for designing and initiating an online learning platform for the stated target group. The pre study also had the aim to guide the authors in how to proceed with each parameter. The pre study involved a literature study as well as semi-structured interviews with different stakeholders.

The literature study within the pre study used the data collected in the literature review. All data was analyzed to identify parameters that are important when implementing and using online learning platforms in a Tanzanian context. The parameters were listed and the amount of references who mentioned the parameter was noted. The authors of this thesis were aware that not all relevant studies on the subject were analyzed. However, the chosen references were based on their Eastern African context and relevance to the study. The time and resources of this thesis were also considered when limiting the amount of references analyzed.

The second part of the pre study included interviews with different stakeholders. The stakeholders that were interviewed were Help to Help staff, both in Sweden and in Tanzania. In addition, other organizations working with similar target groups in Eastern Africa as well as ICT or learning platform providers were interviewed. The aim of these interviews was twofold; to add potential new parameters and/or to increase the validation of already known parameters. The interviews were conducted in a semi-structured way, which according to Denscombe (2017) is a mix of closed and open-ended questions. Semi-structured interviews emphasize the interviewee to develop ideas and discuss widely on the topics introduced by the interviewer. This by having a clear plan of which issues to address, but imposing flexibility in the order and way the questions are handled, (Denscombe, 2017). The focus was to not guide the respondent in their answers but to collect their own thoughts and ideas on the subject. For the full interview guides, see *Appendix A1 and A2*.

2.2.2 Case Study Questionnaire

In the case study, a questionnaire was conducted with the purpose of understanding the opinions and situation of the target group in Tanzania better. Questionnaires are, according to Denscombe (2017), used to collect data within two categories: facts and opinions. Further, a questionnaire is the best option to use when there are many respondents at several different locations and the wanted result is standardized data from identical questions, (Denscombe, 2017). This aligned with the author's intentions of the questionnaire.

The questionnaire was conducted with the literature review and pre study in mind and questions created with the focus on investigating the physical access and interest

of ICT within the target group. The willingness and interest was investigated by asking how they use the internet/their computers, if they were interested in using an online learning platform and if they were willing to pay for it. See *Appendix B* for the full questionnaire.

Together with the Tanzanian Help to Help staff, the questionnaire was iteratively reviewed to ensure that the questions were formulated in an appropriate way and that all areas of interest were covered. The authors also made sure that the questions were straightforward and easy to understand, as suggested by Denscombe (2017). The questionnaire was sent out to all previous Academy program participants that had participated in an activity during the last two years through Help to Help's existing WhatsApp groups for the activities. Table 2.1 below represents the basic information about the respondents of the questionnaire.

Table 2.1 Basic information about the respondents of the questionnaire

Information about the participants	***Quantity***
Number of respondents	117
Gender	68 percent women and 32 percent men
Age	Ranging from 21 to 33
Attended Help to Help Activities [a]	IT/TGEE boot camp: 76/117 Mini IT-boot camp: 24/117 CV Workshop: 41/177 Entrepreneurship Workshop: 49/117 Sustainability Bootcamp: 11/117 Company Visit: 17/117 Understanding the Labor Market: 6/117 Leadership, Corruption and Gender: 6/117

[a] *Note:* This section illustrates how many respondents that have attended a certain activity, meaning each respondent could have participated in more than one activity.

2.2.3 Case Study Interviews

Besides performing interviews as a part of the pre study, qualitative interviews were used in the case study. This was done to further understand the context of the online learning environment and the interests of the target group, as well as to validate and further investigate certain parameters that were identified in the pre study.

Semi-structured interviews were used as the aim was to explore a complex issue, (Denscombe, 2017). To uniformly conduct the interviews and ensure that all

parameters to investigate were included, an interview guide was created. For the full interview guide, see *Appendix A3*. The questions were categorized into themes based on the parameters in question and focus was put on asking about the interviewers perceived importance of and interest in the aspect as well as understanding why they answered as they did. The interview guide was iteratively reviewed by Help to Help staff to ensure that all questions were asked in an appropriate way.

The interviews were conducted over the internet through Google Hangouts using video calls. Adding visual communication, compared to only using audio, is beneficial for several reasons: it imposes small time gaps between question and answer as well as maintains the possibility of seeing and analyzing facial expression and other non-verbal communication, (Denscombe, 2017). Conducting interviews online could also have reduced the possible 'interviewer effect', where the interviewee modifies their answers in different ways due to cultural and gender superiority or factors of embarrassment, (ibid).

The preparations for the interviews started with deciding on specific time slots for online interviews with Help to Help Academy students. As the COVID-19 situation emerged in Tanzania, this included setting up individual sessions as well as safe transportation for each student to the Help to Help office in Dar es Salaam, to minimize any health risk. Additionally, one Help to Help official was present at the office for each interview, which was needed to ensure that the students got access to a computer with internet connection and that there was assistance available.

Further, the authors created test modules in Learnifier, a platform for digital education. As the Business Developer (2020) at Learnifier presented, the focus of their tool is on the integration of physical and virtual meetings for educational purposes. The authors received temporary access to the platform in order to be able to use it in this study. The test modules included videos, text and questions on simple instructional cooking aspects. This subject was considered widespread and easy to understand, which was chosen to ensure that the experience of the interviewees was mostly related to the platform usage, not to the subject itself.

The interviews started off with the participant signing a consent form prepared by the authors as presented further in *2.4 Ethical Aspects.* Further, the Google Hangout meeting was started, and the interviewee got 15 minutes to conduct the module in Learnifier while sharing the screen with the authors. The authors were following the interviewee's navigation on the platform in order to be able to assist him/her if needed. The aim of the testing was for the participants to experience an online learning platform so that they could use this experience as a reference during the interview. This was believed to create more accurate answers to the interview questions. In addition, it was thought to be an entertaining part of the interview creating engagement and willingness to participate.

After the testing, the screen was turned back to video mode and the questions were conducted according to the interview guide. The questions were posed in the stated order and when appropriate followed by follow up questions such as "can you please elaborate on..." and "anything else" to gain a deeper understanding of their answers. This can be compared to using the five whys technique[3], but with the aim of making sure all aspects were mentioned rather than finding the root cause of an issue. At the end of the interview, the participant was thanked, and an opportunity was given to both the interviewer and the interviewee to ask further questions if desired. In table 2.2 below, the basic information about the interviewees are presented.

Table 2.2 Basic information about the interviewees

Information about the participants	***Quantity***
Number of interviewees	7
Gender	43 percent women and 57 percent men
Age	Ranging from 22 to 31
Education	Graduates from a Bachelor Program: 4 Currently Studying: 3 (Bachelor and Master level) Areas of Study: Business and Administration Philosophy and Ethics Computer Science Economy Statistics
Attended Help to Help Activities [a]	CV Workshop: 2 Entrepreneurship Workshop: 2 Sustainability Bootcamp: 1 Company Visit: 2 Leadership, Corruption and Gender: 1

[a]*Note:* This section illustrates how many respondents have attended a certain activity, meaning each interviewee could have participated in more than one activity.

[3] The five whys technique is an iterative technique used to understand the cause and effect relationships underlying an issue. The aim is to determine the root cause of a problem by asking the question "Why?" five times, (Serrat, 2009).

2.3 Data Analysis

Analyzing data can be done with different purposes in mind. The aim of the analysis of this study was twofold: describe the present context (a descriptive approach) and explain and look for cause-effect relationships in the data to be able to predict how it will look in the future (an explanatory approach). Since this study aimed to first identify and then validate and further evaluate parameters that are important for establishing and implementing a new concept, combining these two approaches was considered appropriate. This combination is also encouraged when conducting a small-scale research, (Denscombe, 2017).

To conduct a thorough data analysis the five-step process by Denscombe (2017) was used, which consists of: data preparation, exploration of the data, analysis of the data, presentation of the data and finally validation of the data. However, the five steps differ slightly depending on the type of data (quantitative or qualitative) one wishes to analyze. Analyzing quantitative data involves coding, identifying trends, performing statistical tests and creating figures and graphs to show trends, while qualitative data emphasizes preparations, identification of themes, coding and grouping to finally interpret and triangulate the findings, (Denscombe, 2017). Given this, the answers from the questionnaire (consisting of mainly quantitative data) were categorized by theme and trends identified within them. Further, graphs and figures were compiled in order to present the findings in a clear way.

For the qualitative interviews, the process involved coding and clustering of the data. Codes are, according to Miles, Huberman and Saldana (2014), meant to assign symbolic meaning to the information compiled in a study. It is a way of analyzing and reflecting on the meaning of the data and to assemble chunks of data that go together. The interviews during the case study were recorded and, as suggested by Miles et al. (2014), the authors listened to the recordings afterwards and took notes and excerpts from the participants for each question. The notes were coded using descriptive codes, which means that the labels describe the basic topic of the data that they are assigned to. Descriptive coding was used as it is especially appropriate for social environments and ethnographic questions, which this case study involved, (Miles et al., 2014).

Further, clustering was done in an inductive way[4] to categorize and hence further analyze and draw conclusions on the data and the meaning of it. This was done by deciding on themes based on the parameters from the pre study and the nature of the data itself. Moreover, the results were interpreted, discussed and compared with the pre study. As the pre study included findings from various sources, comparing the findings from the case study to the pre study was a way of validating the results.

[4] Inductive Clustering = Clustering that is done by using labels that emerged during the data collection, (Miles et al., 2014).

However, if the case study results were contradictory to the pre study, the authors chose to draw conclusions on the insights presented by the target group as they were the focus of this study.

Finally, general conclusions were drawn, and specific parameters and aspects were summarized in a requirements specification for the case organization. The parameters were there categorized into three categories based on all findings from the study and their character, relevance and reliability.

2.4 Ethical Aspects

To ensure that the pre study and case study were conducted in an ethically correct manner, the principles recommended by Denscombe (2017) were used as a guideline during the research. Denscombe's (2017) principles include:

- ensuring anonymity of all participants and treating data as confidential
- ensuring that all participants have consented to their involvement and that they do it voluntarily
- operating within the law
- upholding professionalism through scientific integrity

These principles were communicated verbally at the interviews and in written when needed, for example when conducting the questionnaire. All collected data has been treated carefully and the researchers have strived to be as professional as possible. All participants of the interviews in Tanzania were asked to sign a written consent form including:

- information about the research and its purpose
- the expectations of the participant's contribution to the research
- confidentiality and the right to withdraw consent at any time
- security and ownership of data
- identity and signatures of the researchers
- signature of the participant

During the case study, consideration was taken to the power position between the researchers (coming from Sweden, a wealthy, foreign country) and the respondents from Tanzania. With guidance from the Tanzanian staff; language and clothing was adapted to try to level out this difference. However, due to the interviews being conducted online, this was difficult to fully overcome.

Moreover, the researchers did their best to stress that they did not belong to Help to Help and that the collected data would not in any way affect the participants' relationship with the organization. This in order to try to ensure honesty and openness during the case study. The authors also clearly stated the purpose of the interviews and questionnaire and clarified that the respondents' answers would remain completely anonymous.

2.5 Credibility of the Research

To ensure high quality research it is important that it is trustworthy and credible. Wedawatta et al. (2011) specifically states that a case study only is successful when you can establish its validity and reliability. There are several ways to ensure this, for example by using triangulation and describing the research process in a detailed manner to show that the data is well grounded, (Denscombe, 2017).

In this thesis the results were validated by combining different sources of information and methods within the field (triangulation). The authors strived to connect several sources of theory with the results from the pre study and further compare this to the findings from the case study. The research was validated by being iteratively reviewed by personnel at Help to Help that have insights to and knowledge about the context of this study. The results were further validated by the Online Learning Program Manager at Entrepreneurs Without Borders by discussing their plausibility.

As Denscombe (2017) points out, to achieve reliability of a study it should give the same results if performed with the same circumstances at another time. The authors have strived to increase the reliability by working in a structured manner using frameworks and interview guides. The questions in the questionnaire and interviews were clearly stated and the same procedure followed for all respondents. In both the pre study and case study interviews, many of the questions were open in order to cover as many aspects as possible and give the interviewees opportunity to think freely on the subject. These answers were also compared to other findings in the study to increase the reliability.

Transferability is, as defined by Denscombe (2017) as the likelihood of occurrence of the findings in another setting. The study is considered to have some transferability as the subject has been discussed in other studies and the circumstances for the target group of this study holds similarities to others in the

same context. However, no study has been previously conducted regarding this specific target group and situation. Further, the target group in the case study is rather specific, which makes it difficult to claim representativeness for a larger population.

Lastly, objectivity refers to the degree the research can produce unbiased findings, (Denscombe, 2017) which the authors have strived to achieve. The authors, students at Lund University Faculty of Engineering, together with the organization Help to Help are the main stakeholders of this study. There have been no financial incentives present for the authors to conduct this study. The organization has been positive to the public publication of this report and the contribution it can have in the field.

3. Theoretical Framework

In this chapter, the meaning of the digital divide is developed. Moreover, the definition and evolution of online learning is discussed and evolved upon. Opportunities and limitations of online learning are presented, as well as circumstances for effective online learning and the latest advancements within the area. Further, a description of two selected concepts used as inspiration in this thesis are presented, namely the Six Dimensions of Success Factors and the Technology Acceptance Model.

3.1 The Digital Divide

"ICT is the use of computer and other electronic equipment and systems to collect, store, use and send data electronically", (Burgess, 2018:3). The digital divide is the gap between those with access to ICT and those without, (ibid). ICT has become an enabler of innovation and is believed to be crucial for social and economic development, (Baelden & Van Audenhov, 2015) which hence limits those with less access to it.

Globally, according to Baelden and Van Audenhov (2015), the access to and usage of new technologies remain unequally distributed. Many countries are behind in terms of uptake and usage of phones, computers, internet and other technological services and products, which hinders them from development. Developing countries especially are exposed to these challenges. (Baelden & Van Audenhov, 2015)

Baelden and Van Audenhov (2015) further highlights that the digital divide is a diverse term that not only includes physical access to ICT but also other related aspects of ICT usage. Below, the main aspects of the digital divide are presented, (Baelden & Van Audenhov, 2015):

- **Physical access:** The access to computers, networks and electricity
- **Cognitive access:** The skills to use ICT and information
- **Financial access:** The access to ICT related to costs and income

- **Content access:** The availability of information and applications in a usable context
- **Design access:** The usability of ICT related to electricity, illiteracy, visual difficulties

3.2 Defining Online Learning

Online learning has been of great interest over the past decades. However, even though often spoken of, the concept of online learning lacks one common definition. The term was first used in 1995 for a web-based system called WebCT, now known as Blackboard, and since then both the term and its meaning has caused a lot of confusion, (Singh & Thurman, 2019). Singh and Thurman (2019) reviewed 37 references (books and online articles), published from 1988 to 2017, with the aim of investigating the scope and key elements of definitions of online learning. Their findings resulted in eight key elements of online learning, presented in table 3.1, together with each element's occurrence among the reviewed articles, (Singh & Thurman, 2019).

Table 3.1. A content analysis of the definitions of online learning
Created by Singh and Thurman (2019).

Key Element	*Scope of the Element*	*Number of references in which the element is mentioned*
Technology	The definition mentions the necessity or possibility of technology to facilitate education/learning	34
Synonymous terms	Mentions that a given term is synonymous with others	11
Time asynchronous	The definition specifies that asynchronous interaction/communication is an element for online learning	11
Problems in the field	Mentions issues that arise with poorly defined terms/concepts in education	10

Interactivity	The definition mentions the interactive nature of the educational content, whether the student is interacting with the instructor, other students, assignments with automated feedback, videos, etc.	10
Time-synchronous	The definition specifies that synchronous interaction/communication is an element for Online Learning	9
Physical Distance	The definition mentions the physical/geographical distance between student and instructor (usually associated with Distance Education)	7
Educational Context	The definition mentions the necessity of a formal education institution/program for online learning	2

As can be seen in table 3.1 above, most authors agreed that technology is a vital element of online learning. Often, it is mentioned as a great tool for delivering education or as an enhancement for interaction. Further, it becomes clear that many authors find it troublesome that there is no clear definition of online learning and related terms. For example, Seener in 2002 (Singh & Thurman, 2019:295) stated:

> *A host of terms are used to describe teaching and learning that does not take place in a traditional classroom setting – distance learning, distance education, distributed learning, e-learning, independent study, and others. The overlapping definitions and sometimes conflicting uses of these terms confuses the outside observer and sparks debate even among experienced practitioners.*

Moreover, time is another key element used to define online learning, however both the time-synchronous and the time-asynchronous element of online learning are mentioned as possible aspects, not necessities. Likewise, physical distance and interactivity appears consistently in definitions, but not always. Another interesting aspect is that many authors use 'traditional classroom setting' or 'face to face education' as a contrast to help define online learning. This in order to be able to describe what online learning is, without needing to state it explicitly, (Singh & Thurman, 2019).

In total, Singh and Thurman (2019) concluded that there are 46 different existing definitions of online learning and 18 words used as synonyms. The synonyms, with

their corresponding number of usages in the reviewed literature (37 references), can be viewed in table 3.2.

Table 3.2. Synonyms used to define online learning
Created by Singh and Thurman (2019).

Synonyms of online learning	*Number of references using the term*
E-Learning	11
Blended Learning	8
Online Education	6
Online Course	6
Distance Education	4
Distance Learning	4
Web-based Learning	3
Computer Assisted Instruction	2
Web-based Training	1
Web-based Education	2
Web-based Instruction	2
Computer-based Training	2
Web-enhanced Learning	1
Resource-based Learning	1
E-tutoring	1

Computer-based Learning	1
Distributed Learning	1
Computer-assisted Learning	1

Singh and Thurman (2019) stated that it becomes clear that there is a need for more research within this field to clarify exactly what online learning entails and which synonyms that are appropriate to use. There is an overall misuse and overuse of online learning as an umbrella term and far too many avoid trying to develop a reasonable definition by pointing out what online learning not is instead of trying to define what it is, (Singh & Thurman, 2019).

However, as for now, there seems to be three elements that are essential in all definitions of online learning:

- Use of technology
- Time: synchronous and/or asynchronous
- Synonymous terms and overlapping concepts

In this thesis, the definition suggested by Singh and Thurman (2019:302) will be used:

> *Online learning is defined as learning experienced through internet in an asynchronous environment where students engage with instructors and fellow students at a time of their convenience and do not need to be co-present online or in a physical space.*

Precisely as with online learning, there is no universally accepted definition of what an online learning platform is. In this thesis, the definition by Piotrowski (2010:20) will be used, namely: "the software that provides the technical infrastructure on which e-learning activities can take place."

Further, blended learning will not be considered a synonym of online learning but regarded as a mix of educational methods (mainly face to face and online learning) as defined by Burgess (2018).

3.3 The Evolvement of Online Learning

In a certain sense, one can say that online learning emerged from distance learning as the Web and new technologies were invented. The full evolution can be separated into five phases stretching from correspondence learning starting in the 19th century to the interactive online learning that is present today, see table 3.3, (Perry & Pilati, 2011; Kam Cheong, 2018).

Table 3.3. The evolution of online learning
Based on Kam Cheong (2018). Table by authors.

Phase	*When?*	*Technology Used*	*Communication*	*Description*
1	before 1960	Mail	Unidirectional	Teachers sent course content as correspondence; students sent their assignments through mail.
2	1960-1985	Multiple (telephone, mail, audio and video cassettes)	Primarily unidirectional	Telecourses and films were established, however, telephones and mail were still the main teaching medias
3	1985-1995	Mixed media with increased usage of satellite TV	Two-way communication	More and more content was cast in digitized format and emails became a great tool for rapid communication
4	1995-2007	Computer technologies with increased usage of CDs and the internet	Synchronous communication	Pre-recorded or live streaming audio and video lessons were used creating virtual classrooms. LMS, learning management systems, such as Blackboard and Canvas were created to help administrate online courses. Asynchronous learning became common through online discussion platforms.
5	2008 to present	Web 2.0[5], mobile and synchronous technologies	Synchronous interactive communication	The first MOOC, massive open online course, was created ad started to be offered widely. Mobile learning and social media

[5] Web 2.0 refers to the second generation of the world wide web, a much more dynamic and interconnected Web where the users have more possibilities to interact, creating so called “online communities”, (Christensson, 2008).

	serve as additional tools to enrich the students' learning experience.

As can be seen in table 3.3, online learning as previously defined by Singh and Thurman (2019:302), started to evolve within the last two phases as ICT developed and in 2018, about 6.3 million students were enrolled in online education globally, (Singh & Thurman, 2019).

Albashaireh and Ming (2018) claim that the fast advancement in ICT radically has changed the playground for all organizations concerned with education. More specifically, that online solutions have made learning more global, accessible and personalized than ever before, (Albashaireh & Ming, 2018). Already in 2011, Dr. Gajaraj Dhanaranjan, (Kisanjara & Tossy, 2017:111) stated:

> *One would be foolish to question the importance of the internet and www for education in this new decade; at worst it has the ability to connect communities of learners and teachers and at its best it could very well be the tool that education has been waiting on for these past thousands of years; its promise is only limited by the imagination and capacity of the people who can apply and benefit from it.*

Online learning has not reached global acceptance yet, as many still hold traditional education to a higher standard, (Perry & Pilati, 2011). However, looking forward, online learning is expected to grow as more students demand it and it is increasingly more accepted by faculty. One of the main driving forces for implementation of online learning is the increasing demand for higher education, (Kisanjara & Tossy, 2017). Higher education is the life dream for the majority of school children, yet enrolment is low, especially in the SSA region, (Mtebe & Raphael, 2017). Online learning is sought to be the ultimate solution with its lower cost and geographical independence, (Kisanjara & Tossy, 2017).

3.4 Benefits and Drawbacks with Online Learning

Online learning systems and services can be of great help to cope with the growing demand for education and decrease of educated teachers globally, (Lwoga, 2012). Online learning facilitates both learner engagement and overcomes many of the barriers connected with education today. Some of these barriers are lack of physical infrastructure, lack of qualified teaching staff, absence of adequate education budgets and failure of pedagogy, (Kisanjara & Tossy, 2017). Further, online learning holds several advantages compared to face to face learning: it has added the value of flexibility, cost efficiency and accessibility in the educational world. It

also encourages continuous and unconditional learning as it can take place even when the lecturer and student are separated both in time and space, (ibid).

Moreover, online learning allows for easier tracking of achievement and progress as well as easier collaboration and interactivity. Students enhance their personal computing and internet skills and see great convenience of electronic communication, (Queiros & de Villiers, 2016).

On the other hand, online learning comes with high start-up and maintenance costs, need for human support, investment in time and technological dependence. This in turn requires money, people with technological knowledge and access to a sufficient ICT infrastructure, (Queiros & de Villiers, 2016). This is one of the main challenges seen with online learning as ICT infrastructure includes many elements, see figure 3.1 below, (Pima, Odetayo, Iqbal & Sedoyeka 2016). Typical factors that limit the development of ICT infrastructure are lack of technical and managerial support and resistance to change due to fear of new technology and high costs (which usually are correlated). Costs related to internet, sufficient bandwidth[6] access and electricity are often hidden and tend to become much higher than anticipated, (Mwakyusa & Mwalyagile, 2016).

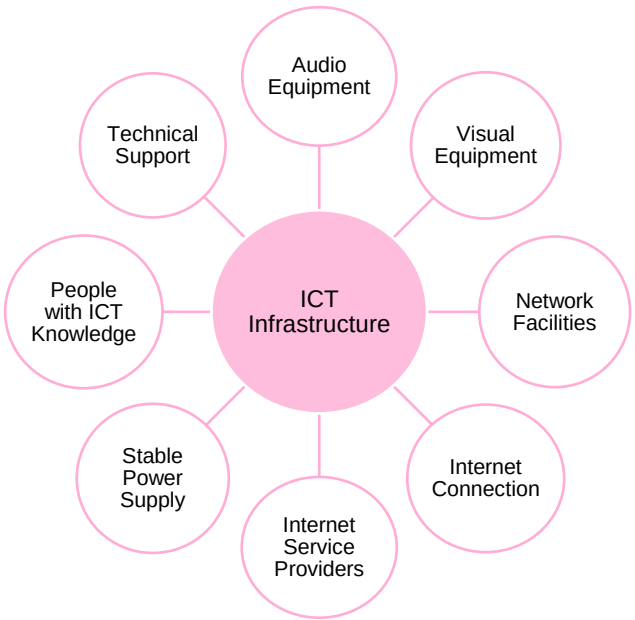

Figure 3.1. The elements of ICT infrastructure
Based on Pima et al. (2016). Illustration by authors.

[6] Bandwidth is used as a measurement of the amount of data that can be sent between computers through a phone line, network or similar, (Cambridge Dictionary, n.d.).

Furthermore, the effectiveness of online learning as a teaching medium is hindered by low literacy levels and restricted access to computers and computer experience among both students and teachers (Queiros & de Villers, 2016). The low awareness of educational technology integration and its benefits is also a barrier for implementing online learning, (Lwoga, 2012). Teachers often have inadequate expertise in online tools that affect the support, presence and material they can provide the students. Further, this increases the resistance for and failure of online education, (Queiros & de Villers, 2016).

Summarized in table 3.4 below are the identified benefits and drawbacks related to online learning.

Table 3.4. Summary of benefits and drawbacks of online learning
Based on Lwoga (2012); Kisanjara & Tossy (2017); Queiros & de Villiers (2016); Pima et al. (2016); Mwakyusa & Mwalyagile (2016). Table by authors.

Benefits	***Drawbacks***
• No need for physical infrastructure • Flexibility • Cost efficiency • Accessibility • Encourages continuous learning • Unconditional learning: geographically and timely independent • Easier to track achievement and progress • Easier collaboration and interactivity • Enhanced ICT skills	• High startup and maintenance costs • Need for human support • Technological dependence • Need for ICT infrastructure • Need for digital literacy • Culture and attitude • Language barriers • Differences in educational setup

3.5 Circumstances for Effective Online Learning

To be able to create an effective online or blended learning context there are several personal and situational circumstances required. Generally, there is no established framework for how to create a successful online learning environment. Instead it tends to depend mainly on the technology available to the individuals, (Mtebe & Raphael, 2013).

At a personal level, skills such as internet search techniques, interpretations skills, internet navigation skills as well as a familiarization with the internet and its common terms are essential for sufficient online learning usage, (Pima et al., 2016; Bhuasiri, Xaymounghkhoun, Zo, Rho & Ciganek, 2012). A positive attitude towards technology in general is also widely recognized as a necessary condition, (Lwoga, 2012). As Kisanjara and Tossy (2017:124) stated: “the more a person is involved in Internet or Web activities, the more they are likely to use e-learning”.

Furthermore, learners need to experience that their prior learning experiences are capitalized, but also that they are supported to move beyond their preferred learning styles. This can be achieved by allowing for interaction with peers and by creating clear, self-directed and structured material, (Diep, Zhu, Cocquyt, De Greef, Vo & VanWing, 2019). From an institutional perspective, important aspects are the readiness of the course provider, the intensity of the adoption of the online learning platform and the perceived impact and willingness to use ICT among the members of the organization, (Burgess, 2018). Mtebe and Raphael (2018) points out that the institutions need to provide technical support to both the instructors and the students. The institutions should also conduct usability testing regularly to ensure the functionality of the online learning system. Further, instructors should be trained in pedagogical skills so that they can provide effective and reliable support to the students, (Mtebe & Raphael, 2018).

The online learning environment needs to motivate the learners by combining text, sound, color and moving images to promote easy involvement and learning, (Kisanjara & Tossy, 2017). In order to establish an online learning design that engages and motivates the students, Halverson and Graham (2019) stress the need for an understanding for when students are engaged and when they are not engaged in their learning. Engagement includes many cognitive aspects such as attention, effort and persistence as well as a willingness and opportunity to spend time on the task. Attention and presence are especially crucial for successful engagement, which requires discipline, self-direction and internal motivation, (Halverson & Graham, 2019). This can be assisted by creating a sense of belonging, a possibility to interact with each other and making sure that the course content is effective, (Almasi, Chang & Machumu, 2018).

The study conducted by Bhuasiri et al. (2012) found that extrinsic motivation is more important than intrinsic motivation in educational situations. The study focused on developing countries and found that online learning systems should use external rewards for participating members. Examples of external rewards could be financial incentives or certifications. Investments that have shown being viable due to the encouragement it provides, (Bhuasiri el al., 2012).

Moreover, the study by Queiros and de Villiers (2016) showed that interaction and feedback is vital for a successful learning process. In addition, it is crucial to consider and incorporate cultural practices to the online learning environment. For example, learning in support groups is a cultural practice in many African countries. This cannot be disregarded only because the learning atmosphere has changed.

Another important aspect to consider is that the newest technology is not necessarily optimal. A hybrid of appropriate, user friendly and accessible technology that is combined with visual media might be more effective, (Queiros & de Villiers, 2016). For instance, system features like few tools and links and support for privacy and anonymous posting were found as key factors for continuous usage of online learning, (Mtebe & Raphael, 2018). It is also pointed out that anonymity encourages

interaction due to the correlation between students less proficient in English and those who dislike online forums in the fear of being misunderstood, (Queiros & de Villiers, 2016).

It is important to take into consideration that different stakeholder groups have different backgrounds, needs and motivations to use online learning. Future research hence needs to consider additional stakeholders and factors to continue to map a better representation of the circumstances necessary when facing online learning, (Bhuasiri et al., 2012).

3.6 Six Dimensions of Success Factors

In 2012, Bhuasiri et al., performed a study of critical success factors that influence online learning adoption in developing countries from the perspective of two stakeholder groups: ICT experts and Faculty representatives. The study identified 20 critical success factors within 6 dimensions using the Delphi method[8] and Analytic Hierarchy Process[9], AHP, (Bhuasiri et al., 2012). This resulted in a ranking from 1 to 6 from the two stakeholder perspectives. Ranking 1 means that the dimension was considered most important and ranking 6 that it was considered the least important, see table 3.5, (ibid).

Table 3.5 The six dimensions of success factors
Created by Bhuasiri et. al (2012).

Dimension	***ICT experts' perspective Ranking***	***Faculty perspective Ranking***
Learners' Characteristics	1	2
Instructors' characteristics	2	3
Institution and Service Quality	5	6

[8] The Delphi method is a forecasting process where questionnaires are sent to a panel of experts, multiple times. The anonymous responses are aggregated and shared with the group, (Twin, 2020).

[9] AHP is a descriptive analysis methodology that organizes goals, criteria and sub criteria by a ratio scale of importance. The hierarchy created is defined through a pairwise comparison of evaluation criteria and alternatives, (Cappelletti & Gasparella, 2016)

Infrastructure and System Quality	3	1
Course and Information Quality	4	4
Extrinsic Motivation	6	5

The distinction that 6 dimensions emerged in the study was especially pointed out as important as this was consistent with all previous research regarding online learning adoption, (Bhuasiri et al., 2012). Moreover in 2018, Mtebe and Raphael performed a similar study aimed at identifying key factors that influence learners' satisfaction with an e-learning system at the University of Dar es Salaam, UDSM, in Tanzania. Precisely as Bhuasiri et al., Mtebe and Raphael found key factors within 6 overall dimensions, presented in table 3.6 below together with Cronbach's Alpha[10] which indicates each dimension's reliability, (Mtebe & Raphael, 2018).

Table 3.6 The six dimensions of learners' satisfaction.
Created by Mtebe & Raphael (2018).

Dimension	***Cronbach's Alpha***
System Quality	0.882
Course Quality	0.824
Service Quality	0.903
Instructor Quality	0.882
Perceived Usefulness	0.900

[10] Cronbach's Alpha: A measure of internal consistency of a test which indicates the reliability of the test. If the items in a test are correlated, Cronbach's Alpha increases. An alpha over 0.8 indicates good reliability, (Tavakol & Dennick, 2011).

Learner Satisfaction	0.903

This six dimension concept was used when creating the pre study framework in this thesis, where identified parameters were categorized to create a clearer overview. The specific dimensions presented above in table 3.5. respectively table 3.6 also served as inspiration when deciding on the dimensions used in this study.

3.7 Technology Acceptance Model

The Technology Acceptance Model, TAM, is according to Arbaugh and Duray (2002) one of the most influential models regarding technology acceptance. The model, presented in figure 3.2 below, consists of two primary factors that are believed to affect an individual's intentions to use new technology: perceived usefulness and perceived ease of use. TAM is used as a foundation framework in many multi-disciplinary studies and although it does not predict adoption, it has proven useful in explaining usage and satisfaction of online education, (Arbaugh & Duray, 2002). However, it is important to highlight that TAM says very little about the technology itself, it only discusses how it is perceived and what it is believed to be. Therefore, the adoption of new technology is dependent on the individual adopting it, (Reveal Media, 2015).

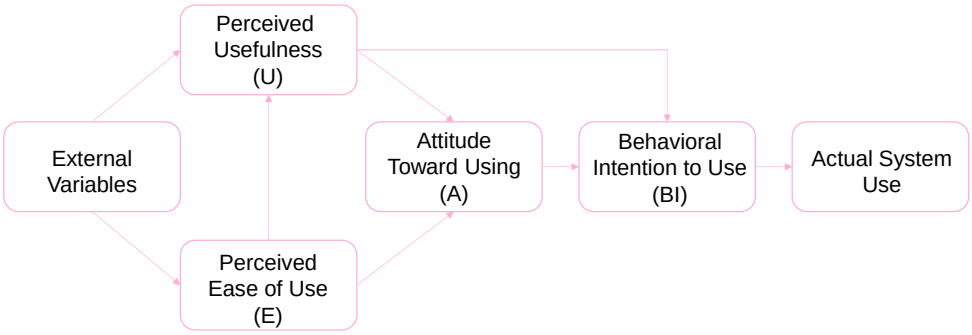

Figure 3.2. The Technology Acceptance Model
Based on Arbaugh & Duray (2002). Illustration by authors.

In this thesis, the Technology Acceptance Model has served as inspiration for how to approach the difficulties with implementing new technology for a specific target group. As the model presents, it is the perceived usefulness and perceived ease of use of the target group that controls the adoption of the technology, which is why this study focuses on fully understanding the needs and challenges of Help to Help's Academy students in order to provide valuable recommendations to the organization.

In addition, one of the primary factors in TAM (perceived usefulness) is one of the six dimensions of key factors found in the study by Mtebe and Raphael (2018) presented above in *3.6 Six Dimensions of Success Factors*. This further emphasizes why this study centers around the user.

3.8 Latest Trends in Online Learning

Online learning has recently received an increasing amount of attention and usage. Due to the COVID-19 pandemic in 2020, the majority of all schools in the world have gradually shifted to online learning in an attempt to decrease the spread of the virus. Therefore, there has been an increasing interest in how online learning should be used successfully for students in various environments and ages. Sandra Chow, director of innovation and digital learning at Keystone Academy in Beijing, especially highlights that educators will not regret spending time on developing online solutions as it will be beneficial moving forward, (Snelling & Fingal, 2020).

One of the online tools that has emerged at the top is Zoom, a video communication tool which allows users to talk to 99 people simultaneously. According to Neate (2020), Zoom was downloaded 2.13 million times in one day and its share price has increased drastically. The app is commonly used to host virtual meetings and classrooms and Eric Yuan, founder of Zoom, hopes that people will learn that with the aid of digital solutions it is possible to work and study from home (even when it is not explicitly needed), (Neate, 2020).

In Africa, one of the latest innovations to help bridge the educational gap is uLesson, an EdTech[11] startup that is trying to meet the learning needs of millions in Africa by merging online and offline components for a full educational experience. By using an offline component which is plugged into a mobile phone, see figure 3.3, users can access uLesson's full library of learning content in an easy manner without the associated costs of streaming online or downloading - they connect temporarily to update the app and material, then access the material and conduct the lessons offline, (Kazeem, 2020).

[11] EdTech, short for Educational Technology, refers to hardware and software designed to improve students' education outcomes and enhance teacher-led learning in classrooms, (Investopedia, 2020).

Figure 3.3. Illustration of the uLesson setup plugged into a mobile phone
Based on Kazeem (2020). Illustration by authors.

uLesson has in other words started to develop a way to maintain all the benefits with online learning (mobile learning) while minimizing its drawbacks. Currently, as presented by Kazeem (2020), the service is on its way to be established for secondary school students in Nigeria, Ghana, Sierra Leone, The Gambia and Liberia in West Africa, however the ambition for uLesson is pan-African, (Kazeem, 2020).

4. Contextual Setting

The following chapter describes the contextual setting of this study, which was Dar es Salaam, Tanzania. Further, Help to Help and their organizational background and mission is described more in detail and the study object presented.

4.1 Introduction to Tanzania

The United Republic of Tanzania was formed in 1964 when Tanganyika (mainland) and Zanzibar (island archipelago) merged after declaring their independence from Britain in 1961 and 1963 respectively, (Nationalencyklopedin [NE], 2019). Tanzania is considered to be a stable democracy, however the country still struggles with severe corruption and insufficient infrastructure affecting its recovery from an economic collapse that occurred during the 1970's, (NE, 2019).

During the last couple of years, there has been a noticeable transition of labor from agriculture to industry and services, however the economy still depends on agriculture which employs roughly 65 percent of the workforce, (Central Intelligence Agency [CIA], 2020). A majority of the population in Tanzania is, due to an overall low attainment of education, stuck in self-employment and the informal sector. It is hard for businesses to grow as there is lack of access to financial sources, which keeps most businesses small and unregistered, (World Bank, 2019). On the other hand, the country's large possession of natural resources and tourism has sparked a high gross domestic product (GDP) growth of about six-seven percent per year in 2009-2017, (CIA, 2020).

Tanzania has a population of approximately 58 million people, which is the largest population in Eastern Africa. The distribution of the population geographically is very unbalanced within the country. Further, about 35 percent live in urban areas, (NE, 2019). Looking at age, the Tanzanian population is very young with roughly two thirds of the population being under 25 years old and the median age (in total for both men and women) being 18.2 years, (CIA, 2020). There are two official languages in Tanzania; English and Swahili. In addition, there are roughly 130 native languages. Tanzania institutes freedom of religion with the largest religion represented being Christianity (about 60 percent) followed by Islam (about 30 percent) and native traditional African beliefs, (NE, 2019).

The education in Tanzania has shown great progress over the last years as a result of the Fee-Free Basic Education Policy. Enrollment in both primary and secondary education has increased as well as student retention, (World Bank, 2019). Today, in principle, all children attend mandatory primary school for 8 years and then about 25 percent of the children transition to lower secondary education, (NE, 2019). In total, there are 37 universities, 15 university colleges and 343 non-university higher educational institutions (HEIs) in Tanzania, (Pima et al., 2016). The gender gap has decreased in primary and lower secondary education, however it remains in upper secondary education where 62 percent of all children enrolled are boys, (World Bank, 2019). The national literacy rate, meaning those who are 15 years and above who can read and write Swahili, English or Arabic, is 77.9 percent for the total population, (CIA, 2020).

Poverty and Income Levels

The 2019 Tanzania Mainland Poverty Assessment presented a decrease in poverty of 34.4 to 26.4 percent from 2007 to 2018 in Tanzania, however the pace of the reduction has slowed down since 2012. There are significant gaps between rural and urban areas within the country where rural households lag behind in almost all aspects of poverty. A large proportion of the population also remains vulnerable to fall back into poverty; for every four Tanzanians who move out, three falls back. Tanzania still has one of the lowest GDP per capita in the world and only half of the population have access to clean water, (World Bank, 2019).

There are several ways of categorizing the world, many of which consist of two categories. Using these types of classifications, such as developing and developed countries, have been questioned and stated to be outdated and unhelpful by both Rosling, Rosling and Rosling-Rönnlund (2018) and the World Bank (2019). Rosling et al. (2018) instead suggests that the world population should be mapped across four categories based on income, see figure 4.1. The income is adjusted for price differences and refers to income per person in dollars per day. Around 35 percent of the Tanzanian population live in poverty with an income of less than 2 USD per day placing them at income level 1 using this classification, (NE, 2019). Moreover, 32 percent have an income between 1.9 and 3.1 USD and 18 percent between 3.1 and 5 USD, therefore falling into income level 2. The remaining population, with an income of more than 5 USD per day, are also placed within income level 2, however with uncertainty to as however they should be placed in income level 3 and/or 4, (Danish Trade Union Council for International Development Cooperation [LO/FTF Council], 2018).

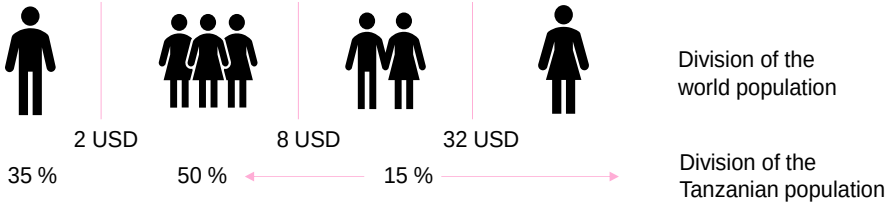

Figure 4.1. Classification of income levels
Based on the Rosling et al. (2018) division of the world population with percentages of the Tanzanian population in each level based on LO/FTF Council (2018). Illustration by authors.

4.2 Skills Gap and Gender Inequality

Skill mismatch is by Morsy and Mukasa (2019) referred to as the situation where an employee, whose skill requirements were not fulfilled, still occupies that job. Education mismatch on the other hand refers to the situation where the required level of education does not correspond with that of the workers. The skills mismatch in Tanzania is 30.5 percent and the educational mismatch is 39.1 percent, (Morsy & Mukasa, 2019). This contributes to a high unemployment rate, especially among youths (people between the age of 15-24) who according to LO/FTF Council (2018) have the highest unemployment rate of all age groups. Unemployment in general is more common in urban zones than rural areas, with a particularly high unemployment rate of 22 percent in Dar es Salaam, (LO/FTF Council, 2018). See figure 4.2 for a summary of the Tanzanian key numbers.

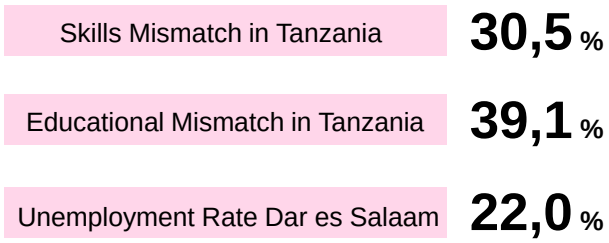

Figure 4.2. Summary of Tanzanian key numbers
Based on Morsy & Mukasa (2019) and LO/FTF Council (2018). Illustration by authors.

Females are on average, based on the study done by Morsy and Mukasa (2019), more overeducated and overskilled at their jobs. However, this is thought to be due to their increased challenges with finding a job (due to discrimination) which leads them to accept jobs below their qualifications, (Morsy & Mukasa, 2019). As presented by LO/FTF Council (2018) there are certain legislations in Tanzania that promote gender equality. Labor legislations for example promote equal treatment in employment; equal pay for equal work, forbids discrimination at the workplace; and

accords the right to take maternity and paternity leave. Still, gender inequality remains in the country. There is a clear dominance of men among paid employees in the formal sector (66 percent of total employees). On average, a man also earns 39 percent more than a woman does. Moreover, women often lack power within the household. The division of responsibilities is unequal, and women are rarely allowed to make decisions related to household assets and income. Women generally also have a higher unemployment rate than men and Tanzanian women are to a lesser extent part of top management and ownership than the SSA average, (LO/FTF Council, 2018).

In addition, there is an ICT related inequality among men and women at the same income level in Tanzania, (Singh, 2017). The number of women who access and utilize ICT compared to men is lower, (Alozie & Akpan-Obong, 2017). This is referred to as the gender digital divide, GDD, (Singh, 2017). However, many are beginning to address this and are starting to see the strategic need ICT has for women, (Alozie & Akpan-Obong, 2017).

4.3 Digital Setting

There has been a tremendous development in ICT access and usage in Tanzania in the past decade and it continues to improve, (Mwakyusa & Mwalyagile, 2016). Further, mobile usage is starting to become a leading technology, Mtebe & Raphael (2018). The digital setting in Tanzania is evolved upon below.

4.3.1 ICT Infrastructure in Tanzania

According to Mwakyusa and Mwalyagile (2016), ICT infrastructure components, such as internet connection, ICT availability, ICT knowledge and affordability of ICT equipment, has become more established in Tanzania. One reason for this is that ICT equipment has become affordable to the majority of the population, thanks to high investments by governmental initiatives, (Mtebe & Raisamo, 2014; Pima et al., 2016; Kisanjara & Tossy, 2017).

Further, Mwakyusa and Mwalyagile (2016) showed that the access level of individual students and teaching staff to ICT equipment is especially high in HEIs, however not sufficient enough to accommodate all students and staff all the time. In a study done at UDSM in Tanzania, Mtebe and Raphael (2013) concluded one especially important factor that affected students' performance and educational gain when using online learning. This was that even though they had internet access the speed was too slow to handle heavy files such as videos or animations. There is moreover still a lack of awareness among ICT users of the available services in

HEIs, poor coordination across campuses and demotivated faculty support that limits the progress of ICT availability and usage, (Mwakyusa & Mwalyagile, 2016).

Pima et al. (2016) concludes that the local area network, LAN, at HEIs is considered strong and some of them can offer both cable and Wi-Fi connectivity. When interviewing students at a HEIs in Tanzania, reliability of the internet was ranked high. However, the students did point out that internet connectivity was a problem in the sense that internet connection varied, power cuts happened some hours of the day and that better bandwidth selections and devices to support these are subject to hidden costs, (Pima et al., 2016). Broadband networks like 3G and 4G are available from all major cellular network operators and Internet Service Providers, (ibid). Many institutions have a bandwidth of between 7 to 20 Mbps, however the cost of this limits the wider adoption, (Mtebe & Raphael, 2017). The installation of the East African Submarine Cable System, EASSy, as well as the East African Marine System, TEAMS, has however contributed to reduce telecom costs by 95 percent and increased the internet speed up to 155 Mbps in Tanzania, (Mtebe & Raisamo, 2014; Mtebe & Raphael, 2018).

The national electricity grid in Tanzania is still limited. Many rural areas are bypassed which limits the integration of technology in education, (Mtebe & Raphael, 2017). Only 10 percent of all households are connected to the national electricity grid, (Lwoga, 2012; Querios and de Villiers, 2016). Additionally, according to the Central Intelligence Agency (2017), 39 million people in Tanzania live without access to electricity.

4.3.2 Mobile Usage in Tanzania

Overall, Africa has become the fastest growing telecommunication sector in the world, with many more mobile subscriptions than in both the US and European Union, (Mtebe & Raphael, 2018). Many people in the Eastern African region even have better access to mobile devices than to clean water and electricity, (Mtebe & Raisamo, 2014). In 2017, 75 percent of the adults in Tanzania owned a mobile phone where 13 percent owned a smartphone, (Pew Research Center, 2018). According to Kibona and Rugina (2015), most smartphones are owned by students at HEIs or in secondary school. This agrees with Pew Research Center (2018) which states that people ages 18 to 29 in SSA are more likely to own smartphones than other age groups. Further, in a study done by Verdict (2019), it was concluded that smartphone subscriptions are growing rapidly (an annual growth rate of 19 percent) and are set to surpass feature phones[12] by 2024 in Tanzania, as illustrated in figure 4.3.

[12] Feature Phones are defined as cell phones that are not as extensive as smartphones, but still contain functions beyond voice calling and texting, (Techopedia, 2016).

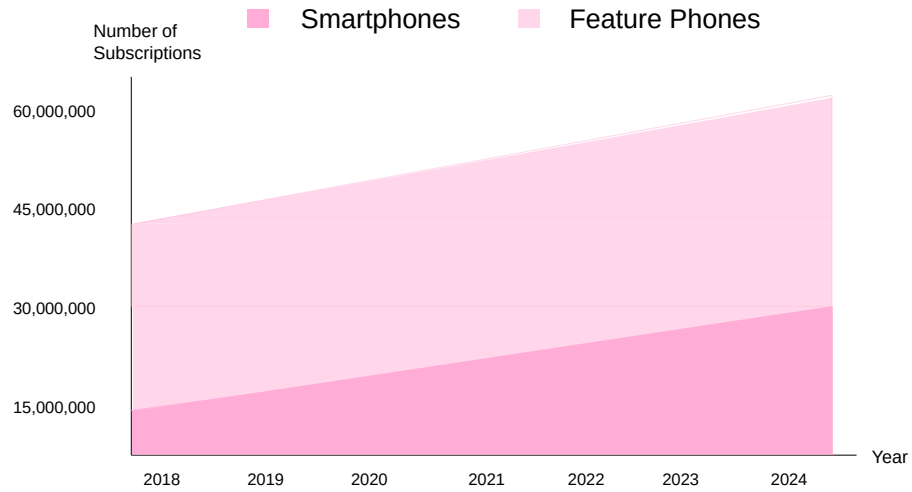

Figure 4.3. Subscriptions by type in Tanzania from 2018 to 2024
Based on Verdict (2019). Illustration by authors.

The rapid increase of smartphones is driven by network deployments of 3G and 4G by mobile operators, for example Vodacom and Tigo. In 2024, the mobile broadband coverage is expected to reach 90 percent increasing the access to mobile data usage, (Verdict, 2019).

As investing in a mobile phone and mobile broadband is much cheaper than buying a computer and investing in fixed internet, (Mtebe & Raphael, 2017) 70 percent of all internet users access the internet through their mobile phone, (Mwakyusa & Mwalyagile, 2016). For example, a 30-day subscription of 20 GB of data costs 50 000 Tanzanian Shilling[13], (Vodacom, 2020) which according to Baelden and Van Audenhov (2015) is what users in urban areas on average spend on data per month. This represents roughly 20 percent of their total income, (Baelden & Van Audenhov, 2015). The wider mobile use in Tanzania has also opened up for innovative mobile applications, such as M-Pesa which allows users to establish a formal bank account and make financial transactions via their phone, (Baelden & Van Audenhov, 2015).

[13] 50 000 Tanzanian Shilling ≈ 22 USD ≈ 206 SEK, (TransferWise, 2020).

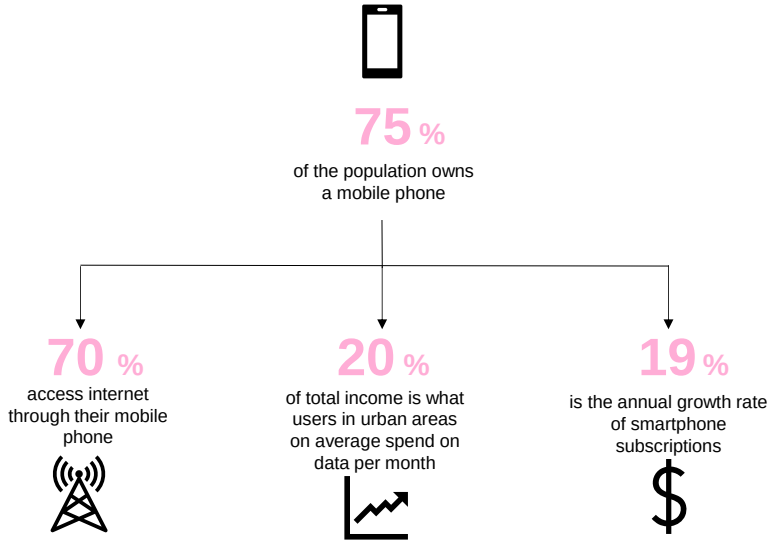

Figure 4.4. Summary of mobile usage key numbers in Tanzania.
Based on Mwakyusa & Mwalyagile (2016); Baelden & Van Audenhov (2015); Verdict (2019); Pew Research Center (2018). Illustration by authors.

The increase of mobile technologies, as illustrated by the numbers in figure 4.4 above, has further created a desire to conduct learning on these devices (mobile phones and tablets), (Lwoga, 2012). Mobile learning is defined as "meaningful learning that occurs through the use of wireless handheld devices such as cell phones", (Albashaireh & Ming, 2018:632). Mtebe and Raisamo (2014) emphasizes that mobile learning provides a way to deliver education without installing complex communications infrastructure and gives even higher flexibility than online learning through computers. Studies show that several factors of the economy have benefited significantly from using mobile devices, however the application of mobile technologies to enhance education is not yet widespread, especially not within higher education in Eastern Africa, (Mtebe & Raisamo, 2014).

Mtebe and Raisamo (2014) points out that students in HEIs in developing countries believe that mobile learning is easy to use and will enable them to accomplish their learning activities faster and more efficiently. In addition, the students believe they have internet access on their mobile devices,and knowledge necessary for mobile learning already, (Mtebe & Raisamo, 2014). Moreover, in the Pew Research Center Global Attitude survey in 2017, 79 percent of the respondents in SSA stated that increased use of internet in their country has had a positive effect on their education, (Pew Research Center, 2018). Given the spread of mobile phones in SSA, the emergence of internet supporting infrastructure and the positive attitude, the use of online learning will likely continue to increase, (Mtebe & Raphael, 2018). This makes the need for finding strategies to increase the success of online learning in these areas critical, (ibid).

4.4 More about Help to Help

The CEO, Chief Executive Officer, of the case organization Help to Help points out that in Eastern Africa, there is a large, young, population who desire to be entrepreneurs, who desire to work as a nurse, doctor or at a large, international, cooperation and develop their society. However, the entry into the labor market is difficult. Help to Help's aim with their work is to aid students to help themselves and for their obtained knowledge to be spread and used to make a difference in society. This due to the belief that making it possible for a population to educate themselves is the best way to foster development in the country, (Cronqvist, 2020).

The Scholarship Program Help to Help conducts has sponsored almost 300 students, where 120 students have graduated. Research shows that 85 percent of the graduate students they have sponsored (who find employment) increase their family income. About 60 percent of these also reimburse education for at least one of their siblings. This is what Help to Help calls the 'Help to Help effect'. The program involves getting your school tuition fully paid, however this is done per semester and as long as the scholar upholds Help to Help's demands. These demands include a certain academic performance level and being active on Help to Help's website. The scholars are chosen based on their financial situation, linguistics, choice of education and personal characteristics. The scholarships are hence going to students that show great responsibility, willingness to contribute to their community and an interest for their subject, (Cronqvist et al., 2019).

Further, in 2019, over 1960 students attended one of the 23 Academy program activities, (Cronqvist et al., 2019). One main part of the Academy program is the ICT initiatives, which includes the TGEE, Technology for Gender Empowerment and Employability IT-boot camp (information technology boot camp) and the corresponding Mini IT-boot camps. The TGEE IT-boot camp is only for females, which not only includes ICT education but also emphasizes female networking and spreading ICT knowledge, (Luthman, 2020b). This has been a growing concept and in 2019 three TGEE IT-boot camps were hosted compared to one in 2018, (Cronqvist et al., 2019). The Mini IT-boot camps are when previous TGEE IT-boot camp contenders, with support from Help to Help, hold their own course about what they learned to others. The Academy program also includes activities with focus on minimizing the distance to the labor market. This is done by courses in for example how to write a resumé, how to start a career as an entrepreneur and organized company visits, (ibid).

Help to Help's activities are about knowledge but also empowerment, belonging, confidence and safety. As pointed out by Cronqvist (2020) the students are often in difficult positions, where going to university has required sacrifices and comes with high expectations from their families and home villages. There is hence a factor of embarrassment, fear and pressure that Help to Help deals with when engaging with these students during the activities. These factors are difficult to address online,

whereas a need is seen to create a safe zone physically first. In a context like this, online learning would therefore have the best results if first accompanied by physical learning, i.e. blended learning, (Cronqvist, 2020).

4.5 Study Object

The target group of this study (the pre study as well as the case study) was Help to Help Academy students who have conducted at least one Academy program activity in Tanzania during the past two years. This involves male and female university students or recent graduates between the ages of 18 to 35. Some of these students have attended an activity connected to ICT, however in general these students were considered to have limited ICT access and skills, as clarified in *1.2 Issue of Study*.

5. Input from Pre Study

This chapter introduces the authors' composed framework used in the pre study. In addition, how the results of the pre study were transferred into the case study is presented.

5.1 Composed Pre Study Framework

To make the analysis of the collected data easier, especially in quantitative terms, a framework for the pre study was composed by the authors as suggested by Denscombe (2017). Firstly, all parameters were listed and provided a name and reference number. These were then clustered into categories as the number of parameters were extensive. Further, the authors used the setup of categorizing important factors into six dimensions. This was inspired by the findings of two previous studies conducted by Bhuasiri et al. in 2012 respectively Mtebe and Raphael in 2018, which were presented in section *3.6 Six Dimensions of Success Factors*. The six dimensions created by the authors were: ICT Infrastructure, Platform Usability, Platform Design, Student's Characteristics, Intrinsic and Extrinsic Motivation and System Support, as presented in table 5.1. For the full table see *Appendix C1*. The specific dimensions were chosen based on the clustering and categorization of identified parameters, but were also compared to the dimensions from the studies by Bhuasiri et al. (2012) respectively Mtebe and Raphael (2018) to ensure their relevance.

The occurrence of the parameter, found in *Appendix C1*, illustrates the amount of references that mentioned it as important in an online learning context. In total, 20 references (literature studies and interviews) were analyzed in the pre study. The authors chose to divide the occurrence into three levels to make it easier to draw conclusions from the results. The limits of the levels were decided based on the result of the pre study to create an even distribution. The three levels: low, moderate and high, were represented as following:

Low: Mentioned in 1 or 2 of the references

Moderate: Mentioned in 3 or 4 of the references

High: Mentioned in 5 or more of the references

Table 5.1. Parameter framework including dimensions and categories
Based on the dimensions and findings from Bhuasiri et. al (2012) and Mtebe and Raphael (2018) adapted to the case setting. Table by authors.

Dimension	*Category*	*Parameter Reference*	*Parameter Name*	*Occurrence*		
				Low	**Moderate**	**High**
ICT Infrastructure	Internet Electricity Access					
Platform Usability	Content Cost Opportunities Compatibility Easy to use Content provider Everything on the same place					
Platform Design	Layout Platform functions					
Student's Characteristics	Experience Attitude					
Intrinsic and Extrinsic Motivation	Gamification Feedback External rewards					
System Support	Introductory training Technical support Support and skills of instructors					

5.2 Case Study Design

The optimal approach would be to thoroughly validate, investigate and test all parameters that arose in the pre study further in the case study. However, due to limitations in time and resources the authors made a selection of which parameters that needed further investigation and which parameters that were excluded from the case study. How the parameters were further treated in the case study is presented in table 5.2 below using the parameter references in table C.1 in *Appendix C1.*

Table 5.2: Impact for the case study (executed plan)
Table by authors.

Further Action	*Selected Parameters by the Authors*
Questionnaire	16, 49
Interviews	5, 7, 9, 12, 14, 16, 17, 18, 19, 20, 26, 27, 29, 33, 35, 37, 38, 39, 44, 45, 46, 50, 51, 52
Withdrawn from the Case Study	13, 28, 34, 36, 40, 41, 53
Excluded from the Case Study	1, 2, 3, 4, 6, 8 10, 11,15, 21 22, 23, 24, 25, 30, 31, 32, 42, 43, 48, 49, 54, 55, 56, 57

Note: Some parameters may appear under several further actions with the intention to be handled in both ways.

As specified in table 5.2, two parameters were investigated through the questionnaire and several through qualitative interviews. As the extent of the case study was limited, some parameters were excluded. These parameters were chosen to be excluded for two reasons: either because their importance was considered already known or because investigating them further would not contribute as much (as other parameters) to the results of the study. More specifically, parameter 1, 2, 3, 4, 42, 43 were excluded as ICT infrastructure and digital literacy are known to be basic prerequisites for being online and hence conducting online learning. Further, parameter 6, 8, 10, 11, 15 were excluded as these regard content which was not the aim of this study to investigate. Parameter 21, 22, 23, 24, 25, 30, 31, 32, 48, 49, 56, 57 were already stated important by the case organization. Lastly, parameter 54 and 55 were not considered as important as other parameters to investigate further due to their already known importance from theory by Mtebe and Raphael (2018) among others.

As this thesis was conducted, the COVID-19 pandemic occurred as previously explained in *1.4 Effect of the COVID-19 Pandemic,* which especially affected this part of the study. Consequently, the category "Withdrawn from the Case Study" was created to handle the parameters that no longer could be investigated. The author's original case study plan can be found in *Appendix C2.* This is presented with the purpose of enhancing the method the authors believed to be ideal to fulfil the purpose of this thesis. This method can be used for further research on this subject and serve as a basis for Help to Help's future work.

6. Empirical Findings

This section presents the findings of this study. First, an overview of the findings is presented. Secondly, the findings are elaborated upon topic by topic through identified main themes. The case study interviewees are referred to as P1-P7 (Person 1 - Person 7) from the order they were interviewed to ensure their anonymity. Moreover, the participants of the questionnaire are referred to as respondents.

6.1 Overview of the Findings

The pre study resulted in 57 identified parameters important for implementing and using online learning dispersed over the six overall dimensions presented earlier in table 5.1. The dimension "Platform Usability" became the dominating dimension including 28 of the parameters. This points to the wide variety of perspectives and aspects to take into consideration when working specifically with an online learning platform.

In general, eight parameters in the pre study were mentioned more than five times corresponding to them having a high occurrence, see *Appendix C1*. The majority of the parameters however had a low or moderate occurrence.

The overall results from the parameters in the case study are illustrated in figure 6.1 below, using the parameter references as seen in *Appendix C1.* The figure includes the parameters that were investigated through the questionnaire and interviews as stated in table 5.2. If the participants had a unanimous opinion about the parameter it was placed to the right; if the students had a nonunanimous opinion it was placed to the left. If the parameter was stated important in the case study, it was placed in the top; if the importance of the parameter did not come forth in the case study, it was placed in the bottom. This was done on a sliding scale.

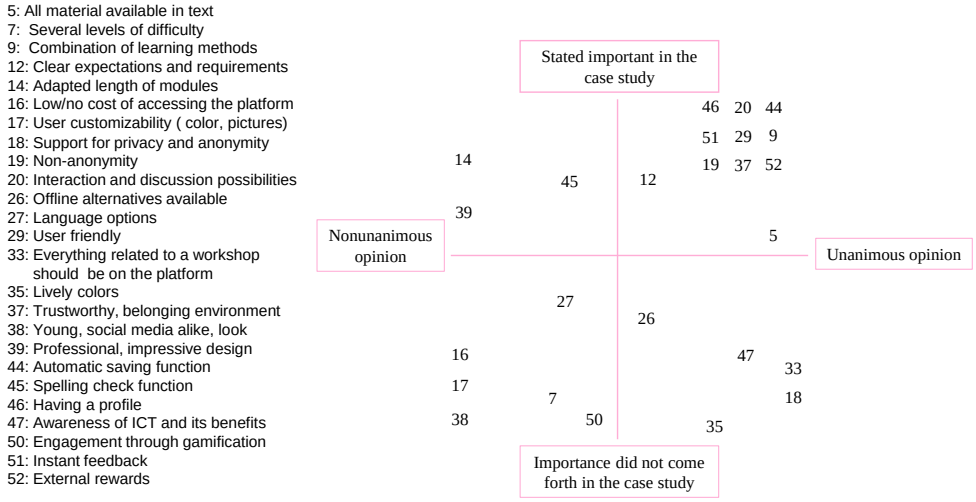

Figure 6.1 Overall results from the case study
Illustration by authors.

During the case study some new aspects were identified that extended the scope of parameters. Support for example was stated by one interviewee as an important aspect to take into consideration, as there are some students that might need more assistance and time than the average student. Further, regarding course content, some interviewees mentioned the importance of making each course feel like a complete story, where all activities are connected in a logical way so that the course is easy to follow. For example, it would be appreciated if the same example or people reoccur during the course to create an entirety. Another new thing pointed out as important to take into consideration is the time aspect of each course. Should there be a definite start and end date of the course(s) or should they be accessible all the time for the students?

Due to the new aspects that arose as well as the extent of the insights regarding some parameters, the authors created a new categorization for presenting the findings, as shown in table 6.1. Sub-themes were identified among the data and grouped into main themes. In the table, the main themes with their sub-themes are presented and, if appropriate, linked to the corresponding dimension(s) from the pre study. Further, the findings will be presented following the order of the main themes.

Table 6.1 Themes of the findings connected to the pre study dimensions
Table by authors.

Main Themes	***Sub-themes***	***Connection to Pre Study Dimension***	***Source of Findings***
ICT Access and Usage	Access to ICT equipment	ICT Infrastructure Student's Characteristics	Questionnaire and Interviews

	Access to internet ICT experience		
IT Confidence and Interest	Attitude	Student's Characteristics	Questionnaire and interviews
Initiating Online Learning	-	-	Pre study
Security and Support	Website security Terms and Conditions Presence of instructors	System Support	Interviews
Learning Preferences	Video content Text Quizzes and results	Platform Usability	Interviews
Engagement and Motivation	Communication possibilities Knowing the purpose Motivation and rewards	Intrinsic and Extrinsic Motivation Platform Usability	Interviews
Time and Cost	-	Platform Usability	Questionnaire and interviews
Preferred Platform Design	Offline alternatives Instructions and language Layout	Platform Design	Interviews
Platform Specifications	Deadlines Difficulty levels Notifications Saving and spelling Profiles and anonymity	Platform Usability	Interviews

6.2 ICT Access and Usage

Access to computers and mobile phones was shown to be high in the questionnaire: 86 percent of the respondents had access to a computer, where 51 percent had their own and the remaining share either had access to a public computer or shared one within the family. Computer usage mainly consisted of schoolwork and work in Microsoft Office. Further, all respondents in the questionnaire had access to a mobile phone, of whom 99 percent owned their own. As Kibona & Rugina (2015) and Verdict (2019) suggests that most smartphones are owned by students in HEIs and that about 30 percent of mobile subscribers in Tanzania own a smartphone, it can be implied that most of the respondents refer to a smartphone when saying mobile phone. Mobile usage among the respondents mainly consisted of internet usage (51 percent) and social media applications (21 percent), which also indicates that a smartphone probably is used. Overall, the target group used their computer/mobile phone to a large extent, more than two hours per day as can be seen in figure 6.2.

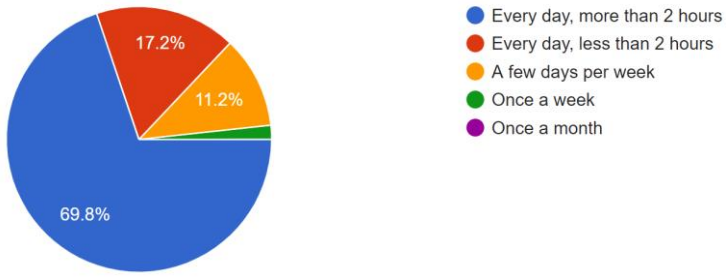

Figure 6.2. Answers to the question: "How often do you use a computer/mobile phone"

The access to internet aligned well with the above as 99 percent of the respondents in the questionnaire stated that they have access to internet. Below, in table 6.2, the locations/devices where the respondents have access to internet is presented.

Table 6.2 Internet accessibility opportunities
Table by authors.

Where do you have access to the internet?	***Distribution***
Mobile Phone	87/117
Home	18/117
At School	33/117

Other place (e.g. Internet Café)	11/117

Note: Each respondent had the option to choose more than one alternative.

The internet connection was rated to have a medium quality (works well sometimes, sometimes fast and sometimes slow) or higher by 86 percent of the respondents. Moreover, most of the interviewees from the case study interviews had previous online learning experience from reading and watching YouTube videos. However, only a few of them had tried an online learning course. Those who had tried online learning had experience from many different platforms such as Moodle, ETX and Alison, all which include many different functions such as webinars, videos and discussion forums.

When addressing previous experiences with ICT in the pre study, it became clear that a problem with online learning is that the majority of all existing online learning platforms tend to have many small technical features that are too advanced for the target group. For example, at many sites you are expected to understand that to return to the homepage after entering a subpage you need to press an icon (without it being stated explicitly). Likewise, it is expected to be commonly known that most websites use hoverable dropdown menus rather than showing the menus with all content clearly at all times.

6.3 IT Confidence and Interest

The respondents in the questionnaire reported that they considered themselves to have high confidence in using IT (91 percent agreed or strongly agreed with having high IT-confidence). Further, looking at the general reflection of the testing platform Learnifier from the case study interviews, all the interviewees were united saying that it was easy to use. They believed the material was presented in a structured way and that the platform had a nice and clear appearance. Overall, the authors perceived that the interviewees relatively easily navigated around the platform - most of them needed no assistance and they seemed used to computer usage.

> *"At the end of the day, if the website is easy to navigate, many people will be compelled to use it. If it is hard, they might lose interest", (P3).*

Moreover, the interviewees were in general positive to Help to Help wanting to start using online learning, as many today miss the chance to participate in physical activities due to living too far away. An online learning platform would therefore make learning more accessible for the target group. Some interviewees especially highlighted that they think it is great that Help to Help wants to start using online learning, since:

"everything in the world is going towards technology", (P6).

Additionally, it was mentioned by the interviewees that it would be appreciated to learn more about online learning and its benefits in general to get inspired to engage in these types of online courses. Further, over 80 percent of the respondents in the questionnaire agreed with them being willing to use an online learning platform, see figure 6.3, and a majority would be willing to pay to use it, see figure 6.4 below.

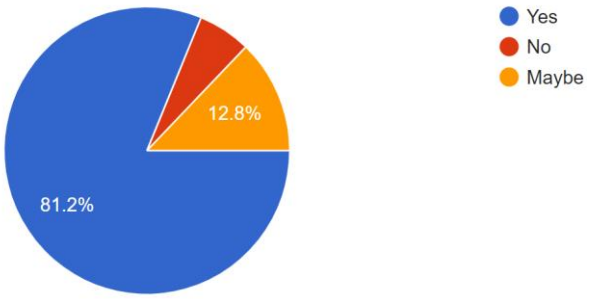

Figure 6.3. Answers to the question: "Would you use an online learning platform?"

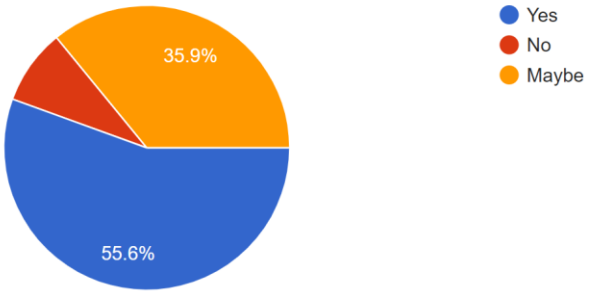

Figure 6.4. Answers to the question: "Would you be willing to pay to use an online learning platform?"

6.4 Initiating Online Learning

Specific suggestions to the initiation of online learning for an organization was given by both the CEO at Entrepreneurs Without Borders and the Business Developer at Learnifier during their interviews in the pre study. The emphasis on these suggestions were to work iteratively and have a thorough planning phase as the target group needs to be understood and consulted at each step of the process to avoid using resources on the wrong things. It was also mentioned that competence needs to be attained in house to be able to develop and manage this project in the longer perspective.

"It is dangerous to see this as a temporary project if you want to use it in the long run", (Senior Business Developer at Learnifier, 2020).

Further, both interviewees stressed the importance of maintaining the concepts used in traditional classroom education when going online, such as the pedagogical adaptation of learning methods and the continuous course evaluations.

6.5 Security and Support

While being online, many of the interviewees from the case study mentioned that they are aware about website security. They mentioned that they only trust websites that have a strong brand or a brand/person that you recognize or if the website has been recommended by someone they trust. Further, all interviewees agreed that feeling connected to Help to Help on the website would be a big contributor to trust. Seeing Help to Help's logo, colors or pictures and contact information would create the feeling of connection and hence trust. One interviewee also mentioned that it is important that the safety of the students' profiles on the platform is ensured, by for example encouraging the students to create strong passwords.

Further, as pointed out by one interviewee, the Terms and Conditions need to be accurate, updated and available to all users. The interviewee stressed the importance of setting rules for platform usage and stating them clearly, just as you would in a physical classroom setting. A good way to do this is by providing a short summary of the rules, which is easily accessible on the platform as well as offering a full document of all the rules and conditions for those interested.

For it to feel safe and for the participants of the course to have someone to turn to on the platform, having instructors present at the platform was mentioned as very important. It was suggested that there should be at least two instructors available at the platform, one who can handle administrative questions and one that is an expert on the course material and thereby can assist with the learning. The instructor is also suggested to encourage discussions, reply to comments and facilitate interactions.

6.6 Learning Preferences

The interviewees in general had different opinions on their preferred way of learning something. Three of the interviewees mentioned reading as their preferred way of learning. Likewise, three of the interviewees pointed out watching videos as their preferred way of learning, as it takes less time than reading, is more inspiring and is easier to understand as they are more visual. Videos are considered more active and

including them at the platform can then make the platform feel more alive. However, other interviewees mentioned that videos sometimes are difficult, for example if you miss something, as it is easier to reread than to rewatch something.

A great majority of the interviewees also stated that they usually go to YouTube to look up something that they might have read or heard in a lecture but want to know more about or did not fully understand. Most interviewees also mentioned that they prefer to read while learning, but that videos and audio are good complements. Discussing with others was also lifted as a good way of learning.

6.6.1 Video Content

The interviewees agreed that it would be appreciated to have all videos complemented with a summary or similar in text to highlight the most important parts. This would help make the message clearer and make it easier to remember and review the information again. One interviewee mentioned that it was preferred to take notes yourself, however agreed that it could be beneficial to others that usually do not take notes when learning. One interviewee also pointed out that the videos should be self-made by Help to Help to make it easier for the students to ask questions about it and also to create a sense of exclusiveness for the community on the platform. The interviewee believed that the participants of an online course would be more willing to engage on the platform if a clear sense of belonging and exclusiveness was created, as you would feel that you could not get the same information or experience elsewhere.

6.6.2 Text

The second activity in the test platform consisted of a longer text (1395 words), see *Appendix D,* followed by a quiz. The interviewees in general found the text to be too long and highlighted that there were some words that were too complicated and hence ruined the full understanding. They recommended that all texts should use simpler language, be placed in the middle of the page and that no text should be used without having attached pictures or fun features to it.

> *"All text should be accompanied with a picture so that they become more interesting. It should never be boring", (P5).*

6.6.3 Quizzes and Results

All interviewees agreed that the quizzes were good and that receiving the results right away was important. The quizzes were pointed out as motivating and a perfect

tool for the user to understand more and be able to repeat their knowledge. One interviewee especially appreciated the length of the quizzes (3-4 questions) stating that too many questions make it boring.

Important aspects that were lifted were for one, that the submission of the answers need to be clear to the user and that the feedback from the quiz needs to be encouraging and motivate further use and learning. Moreover, several interviewees mentioned that it is important that the user is able to retake the quizzes, so that you can really learn the material and get the opportunity to improve. However, to ensure that it does not become too repetitive or that users take advantage of this to cheat, the questions should be flipped around each time you take the quiz. At the end of each module, there should also be a final test that you can only take once. Moreover, at the end of the course, all answers from the quizzes and final tests should be accumulated and illustrated clearly to get an overview of how you performed.

When conducting assignments or quizzes on the platform, the interviewees all agreed that it is important and very appreciated to get feedback on your results right away. It is pointed out that it helps you to know what you did well and what you need to work on more, and hence motivate and guide you on how to proceed. One interviewee also mentioned that it would be appreciated to continuously, maybe once a week, get a summary of what has been completed so far in the course and how you have done to help you get an overview.

6.7 Engagement and Motivation

The interviewees from the case study agreed that communication with the instructor and other participants on the platform is crucial for the learning experience. They mentioned benefits such as becoming motivated by each other, increasing your knowledge by sharing your thoughts and questions and hence creating a sense of belonging by helping each other. As one interviewee mentioned, you will learn much more if you interact. However, as another interviewee brought up, everyone does not have experience with communicating online, especially not with many people at the same time, and hence might feel uncomfortable communicating with too many people at once. This might indicate that the possibility to create smaller groups within the platform would be appreciated.

Many interviewees pointed out the importance of being able to talk to the instructor of the course. Both with the purpose of asking questions, being able to get feedback and assistance, but also to themselves be able to give feedback to the instructor. When addressing communication channels on the platform, the opinions were scattered. Some of the interviewees mentioned email as an important communication channel as it is considered formal and many people pay close attention to their email. However, one interviewee pointed out that email might be

too distant from the platform and that there could be benefits with keeping the communication on the platform. Hence, having options like a chat, an open discussion forum or the possibility to conduct video calls with each other on the platform, are believed to be appreciated. It is also mentioned that having a backup channel, such as having a WhatsApp chat, and having access to the phone number of the instructor, is important if anything were to go wrong with accessing the platform.

6.7.1 Knowing the Purpose

A majority of the interviewees agreed that it is important to know why you are doing something and what you will gain out of that activity, before conducting it. It is pointed out as a key motivator for completing a task. It is the basis for creating goals and is great to be able to know in what way this specific course or knowledge will contribute to the bigger goals you might have, such as career goals. As interviewee P6 pointed out:

> *"You cannot be learning without knowing the purpose", (P6).*

The interviewees stated that each module preferably should have a short summary in the beginning, so that the user easily can see what the module is about, how many activities it contains and what contribution it will have to the course as a whole. In the same way, the whole course should have a similar description in the beginning.

6.7.2 Motivation and Rewards

Many of the interviewees agreed that games, competitions and high scores would motivate you to perform your best at the same time as it would make you feel more connected to others, which itself is motivating. To interact and share your experience and thoughts with others and be able to help each other would also make it more fun and encouraging. One of the interviewees also mentioned that feeling connected to the owner(s) behind the platform, i.e. Help to Help, would increase motivation. It was also stated by some of the interviewees that having videos, pictures and different ways of showing the material helps to keep the motivation up, rather than just working with text.

> *"Someone is supposed to learn something; therefore he/she needs to think it is fun," (P5).*

One interviewee acknowledged the benefits of rewarding participation in the course. It is important that the students are encouraged by the instructor to interact with each other and stay active on the platform by commenting for example, since that will

make it fun to participate in the course. Getting points for participation is hence a great way to encourage such behavior. However, even if participation is encouraged, it should not be required.

> *"Engagement is good, but not forced engagement", (P5).*

Furthermore, receiving a reward when completing an online learning course is by the majority mentioned as very important. When asked what they would prefer to receive, six out of seven interviewees replied: "a certificate". The motivation for this was unified: that it would help prove that he/she had completed the course and thereby be useful when applying for a job. Money was mentioned as being inappropriate, sending a bad vibe, and physical gifts overly complicated.

> *"You dedicate time and resources for something, so of course you want to be able to show that you did it", (P1).*

> *"Receiving a reward is good motivation and encouragement, but it should be kept easy", (P6).*

6.8 Time and Cost

All interviewees expressed their excitement to use online learning and said that they are willing to spend time on it every week as long as the subject is something they are interested in. When asked how much time they would be willing to spend per week on an online course from Help to Help the answers ranged between 1-21 hours per week with the most common being around 4-6 hours. However, as all interviewees mentioned, it can vary between weeks with their schedule and also depending on what the course is about and how well you know that subject.

Half of the group of interviewees stated that they prefer to sit many short sessions when learning something and the other half the opposite, i.e. a few longer sessions. Short sessions were specified as sessions lasting 10-60 minutes and long sessions as sessions lasting 1-2 hours.

When addressing the issue of cost for the online learning courses, all interviewees started their statement with "it depends." It depends on the subject, your goal with it and the extent and quality of the course. Many however agreed that they in general were willing to pay to learn something online that they believed would be of use. It is also mentioned that it is a social norm to pay for your education in Tanzania and hence online learning would be no different.

Regarding payment plans, there was an equal distribution between those of the interviewees who preferred to pay per month and those who preferred to pay per course or per the material you get access to. For those who preferred to pay per month, they mentioned it being because that is a payment method they are already used to. However, for those who preferred to pay per course or for certain material, it was mainly due to two things: First, that you do not know how much time a course will take and how much time you will have available. It would hence be risky to pay as you might not have time to complete the course. Secondly, it is pointed out that paying per course gives you the opportunity to access the course when you have the funds ready, instead of needing to ensure that you can continue to pay next time period as well.

One interviewee more specifically brought up the aspect of cost in relation to different payment plans. The interviewee was willing to pay up to 50 000 or 100 000 Tanzanian shilling per course, if you could split it up and pay continuously per module. But to pay that amount at once would be a challenge and bring hesitation. In general, it was also mentioned that the amount for the course would depend greatly on each individual's economic situation and motivation with the course. The best option would naturally be to offer it as cheap as possible (or free) to reach as many students as possible.

Furthermore, 80 percent of the respondents in the questionnaire stated that they pay for their own internet and an additional 15 percent stated that they sometimes pay for accessing the internet. The price range of accessing the internet differed a lot, all from paying 1000 Tanzanian Shilling for one hour to 10000 Tanzanian Shilling for a month. No clear trend could hence be observed. In addition, some respondents did not reply at all to this question or forgot to specify for which time period they paid a certain amount, resulting in fewer responses than on the entire questionnaire. Moreover, the price differed a lot between respondents, which most likely was due to different amounts of data included in each payment term. This was not asked to be specified by the researchers and hence, the costs can only serve as an indication of the general spend on accessing the internet among the target group.

Another important aspect when addressing payment in relation to the course, is to adapt the cost to the local market. One interviewee mentioned some previous experience with wanting to take American online courses. However, as the prices were not adapted to the local market, the courses were considered too expensive.

6.9 Preferred Platform Design

Most of the interviewees stated that accessing the internet is not problematic, however having the option of downloading content and being able to do things from the course offline would be appreciated. Not everybody has the same access to the internet; some experience very unstable internet where there are issues with quality and others might need to save their data for either monetary reasons or to have data left for other tasks. In general however, having offline options was not mentioned as necessary and one interviewee mentioned that being online is a lot more fun than doing things offline. Several of the interviewees also mentioned that it is important to be able to access the platform via their mobile phone, as computers are very expensive, and it is easier to access the internet from your phone.

Moreover, all interviewees agreed on that having the applications for all Help to Help activities at a common site will make it much more convenient for Help to Help's target group to apply. Further, it is pointed out that having all applications at the online learning platform will be especially good as it will make Help to Help less WhatsApp dependent and encourage the students to start using the platform in a natural way. Another interviewee also added that it is good that the students during the application are encouraged to express their expectations of the activity and what they desire to learn. It creates a connection to Help to Help and makes you more interested in the subject.

6.9.1 Instructions and Language

Regarding instructions, the majority of the interviewees stated that it would be great to have a welcoming video instruction (5-10 minutes long) when entering the online learning platform for the first time. In the video, an instructor should show where you can find everything at the platform, present the rules of the platform as well as how it works and how you orientate on it. Having this in video format is pointed out as being motivational, effective and fun. However, some highlighted that a link to a pdf with the same material in written format should also be available for those who prefer to read. Further, the interviewees agreed upon that 'short text in easy language' is the best option for all instructions at the platform as long instructions might scare people off. Animations were by three of the interviewees mentioned as unclear, unfamiliar, and confusing. P7 especially stated that:

> *"traditionally you don't use these things in Tanzania." (P7)*

However, two of the interviewees expressed curiosity about animations and said that it might be motivational.

The language on the platform should, as unanimously stated by the interviewees, be English. English is stated as the formal, business language of the world and that it is very important to be able to communicate in English. Having the platform in English would also make it accessible for people from other countries. Some of the interviewees however agreed that it would be beneficial if the instructions specifically were available in several languages, such as English and Swahili, to ensure that everyone understands the basics of the platform and course. Two of the interviewees also mentioned that it would be nice to be able to choose languages on the whole platform, as some might prefer to study in Swahili. However, they also agreed that the main language still should be English and the option to choose would just be a plus.

6.9.2 Layout

When addressing the design of the platform, the aspects of layout and color were discussed by using visuals in the case study interviews. Most of the interviewees had very different opinions on the visuals and which color combinations they preferred. They pointed out that everybody likes different colors and hence it would be fun, but not necessary, to be able to choose background colors and similar yourself on the platform. Colors are considered to bring excitement, motivation, and help engage people but can also be risky. One interviewee pointed out that the colors cannot be too bright or crazy, as that draws your mind away from serious business. Another interviewee brought up the aspect of poor eyesight or colorblindness, where too much color might make it difficult to see the content. Several interviewees agreed that the content, especially the boxes with text, need to be clear and distinguished from the background and hence black and white are good options. However, several interviewees also pointed out that dark, blended colors are dull and that subtle colors such as light blue are appreciated. A good option might be to provide a neutral base of the platform with the option to add small details of color. For example, the base of the platform could be in black and white to create a clear, neutral environment and the user could then further have the option to choose a color for the header or similar to please personal preferences and create engagement.

Looking at style and layout, no clear preference was found as the two options that the interviewees were asked to choose from received an equal number of votes. Hence, it is not possible to conclude on one style and layout that the target group prefers, it depends on personal opinions. However, all interviewees agreed that option one looked more professional and organized, while the second option was mentioned as being playful and more fashionable, see *Appendix A3* for the alternatives. A common opinion from the interviewees was that the color pink should not be used as color for the platform, because it makes it “too girly and unprofessional”.

6.10 Platform Specifications

Having deadlines was a concept agreed on by all interviewees as important for succeeding with your work. Deadlines pressure you to prioritize your tasks, structure your time and work and motivates effectiveness. One interviewee mentioned that the reason most people fail courses is that they confuse their time, do not prioritize the work correctly and hence lag behind in the whole course. Issues that deadlines could help prevent.

Moreover, when asking questions about the necessity of clear requirements (having explicitly stated demands such as passing 75 percent of the quiz before being able to continue with the next activity), the interviewees were not completely aligned. The majority pointed out that it is good as it helps to simplify the work, make sure you know what is expected of you and that it serves as good motivation.

P5 said:

> *"You should not have to pass 100 percent, but it is good to have some requirements that are clearly stated", (P5).*

Likewise, another interviewee expressed that requirements:

> *"would make me make an effort to do well rather than just going through the questions", (P3).*

However, some stressed that it depends on the subject and that it should not be used all the time, only to some extent.

When addressing the difficulty level of the modules and activities in the course, all interviewees agreed on a concept where you start off with easier questions or modules and then progressively move on to more difficult and challenging questions or modules. Being successively more challenged will according to them be motivating and develop their knowledge. However, it is also good to mix the more difficult material with easier content to ensure that each student understands and for building up confidence.

Further, some of the interviewees believed choosing between an easier and a harder track might be good, especially depending on the previous knowledge you have on the subject. It is very demotivating to start a course and get every single question right (i.e. it being too easy), but in the same way discouraging to get a too hard track and not being able to pass. As stated by one interviewee, it might however then be important to consider the effect of labeling a module "easy" respectively "hard". This might contribute to a participant avoiding the more difficult level as it sounds unattainable.

A few of the interviewees mentioned notifications as an important factor to consider when designing an online learning platform. Two of them especially pointed out that notifications should be triggered when you have left an activity incomplete for a few days for example, but also in general to remind you to finish the course you have started. In addition, another interviewee stated that the notifications should not be set by default, each user should rather be informed (by a pop-up for example) that they should set the settings they wish for in the beginning of the course/when they enter the platform. This is because if the notifications are set by default, each user will probably receive many notifications through media they do not regularly use, hence making the notifications lose their purpose.

6.10.1 Saving and Spelling

All interviewees agreed that it is very important that the platform has an automatic saving function that remembers your results and where you left off. Especially since it is common in Tanzania to experience unexpected power cuts (meaning your work otherwise might disappear).

Regarding having a spelling check function (for English) at the platform, all interviewees stated that it would be nice as English is not their mother tongue and that a spelling check function would help them to improve their language. Four of the interviewees even mentioned it as necessary as many Tanzanians are not confident in English and might fail tasks or applications only because of grammatical errors. One interviewee suggested that autocorrect should not be used, but rather that the words that are misspelled should be underscored in red or that you should receive a notification if there are big mistakes. In addition, grammatical add-ons were mentioned as a good option if a spelling check function cannot be automatically installed at the platform.

6.10.2 Profiles and Anonymity

All interviewees agree that having a profile on the online learning platform is good, as it will help them connect with others on the platform and make interactions easier. However, many highlighted that the profile should stay limited in terms of what it displays; name and profile picture is good, while age should be optional and civil status is too much. When it comes to anonymity on the platform, the interviewees had various opinions even though many stated that it has both advantages and disadvantages. The main benefit with being anonymous that was mentioned was being able to feel more secure to express yourself and write things on the platform. Contrary, drawbacks that were mentioned were that it would be inconvenient for Help to Help (the platform owners) and that it would be difficult to track people and

know who is responsible for doing and saying what. The majority agreed that it should not be an option, as it would cause more confusion than benefits.

> *"In everything there are consequences and benefits, but it is better to know who you are talking to so that it is not someone pretending to be someone else", (P6).*

However, another interviewee pointed out that it is important to consider other options for those who do not want to be known at the platform:

> *"Those who are worried should be able to reach out to the instructor and then the instructor can pose the question officially at the platform if it is important for everyone to know about it. In that way you can be anonymous, but still be a valid known user", (P1).*

7. Discussion

In this section, the findings from the case study are discussed and interpreted based on how they compare to initial thoughts and literature.

7.1 Surprising Insights

The findings of the conducted questionnaire aligned well with previous findings regarding ICT access in Tanzania, as presented in section *4.3 Digital Setting*. The insights confirmed the possibility of implementing online learning and gave indications to which devices and access opportunities the target group has. These findings however challenged the initial idea the authors had regarding the students' ICT access and skills. It is still limited compared to more developed countries, however the access to internet and ICT equipment proved to be higher than expected. Most part of the target group showed to have access to a computer in some way, and all participants of the case study had access to a mobile phone. Theory presented by Kibona & Rugina (2015) and Verdict (2019) further indicated that this specific target group probably has a smartphone as their mobile phone, which the authors did not believe initially.

Moreover, what was especially interesting that arose during the case study was the great willingness to use online learning within the target group. This was surprising as the authors assumed the target group to have less experience of and exposure to technology than for example someone from Sweden, and thereby also indirectly assumed that the target group might feel sceptic about using technology as a means to educate themselves. In addition, the authors did not expect the target group to be fully aware about online learning - what it is, entails and how it is used, but as the results show this was not the case. However, many of the respondents in the questionnaire might have been unwilling to acknowledge that they did not understand what online learning respectively an online learning platform is, which could have affected their responses. On the other hand, the willingness for usage and payment for online learning was confirmed during the interviews, which can serve as an indication that the majority of all respondents in the questionnaire understood what they replied to. The interviewees seemed genuinely interested in the subject and many further stated that they were used to using some online systems

at UDSM, which studies by Mtebe and Raphael (2013) and Mwakyusa and Mwalyagile (2016) confirms.

On the other hand, it was also interesting that even though the ICT circumstances showed to be better than expected for this target group, many issues are still connected to digital literacy and ICT infrastructure. Functions such as website icons and hoverable dropdown menus are often taken for granted by more digitally literate people. In addition, it is easy for someone with very stable internet connection to forget that not everyone can stream videos to the same extent, even if they have access to internet.

Further, many of the interviewees immediately expressed their disapproval for visual animations, which did not align with what the authors expected as using visuals was pointed out as important by several stakeholders, for example Kisanjara and Tossy (2017) and Cronqvist (2020). One interviewee expressed that it is a cultural thing, however, it could also be due to past bad experiences and/or unawareness about how visual animations can be used at an online learning platform. Animations were not used in the module at Learnifier, so it might have been hard for the interviewees to put it into that context when answering the question. Some also said that using animations could be motivating, but in general the authors believe this aspect needs more investigation before reaching a conclusion.

7.2 Assessment of Pre Study Framework

Dividing the parameters into six dimensions (used in the pre study framework) proved to be inappropriate in this study as there were several parameters from the case study that did not fit in in any dimension as well as that the distribution of parameters between the dimensions was uneven. Alternatively, the dimensions the authors chose were not appropriate. This does not imply that the subject is not appropriate to divide into six dimensions, but in this study, the nine main themes reflected the findings in a better way.

Moreover, some parameters in the pre study got a high occurrence, however, during the case study these did not stand out as more important than other parameters. Hence, the occurrence presented in the pre study is more likely to represent how well researched that parameter is in this context rather than the importance of it. However, the authors have not explicitly researched this.

7.3 Aligning or Contradictory Results

Most of the results from the case study concerning parameters regarding a specific function or concept agreed with the results of the pre study, for example a spelling check function was considered important in both. A few parameters on the other hand unanimously contradicted what was stated in the pre study. For example, the option to choose language on the platform was not considered important for the interviewees as they all stated that the platform should be in English. The parameter that emphasized the importance of lively colors in the pre study was also contradicted. In general, the interviewees believed in having a clear, structured platform with subtle colors, but many had different preferences on what type of layout and which colors they preferred. The pre study also resulted in several subjective and contradictory parameters, for example both anonymity and non-anonymity were lifted. These contradictory situations show that many aspects of learning and being online are dependent on the target group and setting it is designed for. This aligns with Bhuasiri et al. (2012) who claim that research needs to consider additional stakeholders and factors to map a better representation of the circumstances necessary when facing online learning. Further, this shows a need for variation, for example by providing options to the way the material is presented and the length of the modules to make sure that each student encounters their preference some time. This also emphasizes that even though studies have been made on similar target groups, there may still be deviations between them.

Further, more information is required for a complete understanding of the importance and preferred configuration of some parameters. For example, the text during the testing module was pointed out as too difficult and too long, but it still does not give information regarding what is considered appropriate in terms of language and length. In the same way, when addressing gamification, it was not clear in what way or to what extent this would be appreciated. Additionally, aspects of layout and color would require a more quantitative investigation to draw any full conclusions, as the information in this study mostly regarded general comments and personal preferences.

Lastly, some completely new aspects and parameters concerning online learning arose during the case study (without having been mentioned in the pre study). This indicates that online learning is evolving quickly and that continuous updates and studies regarding this subject in various settings are required.

8. Conclusions

The following chapter presents the conclusions of this thesis. This involves answers to the research questions of this study and recommendations to the case organization. Further, the contribution to theory is discussed as well as the limitations of the study. Lastly, future research is suggested.

8.1 Answers to Research Questions

Below the answers to the main research question and sub-questions are summarized. All conclusions are drawn with the entire study in mind, meaning that all identified aspects and parameters are considered.

1. **Which are the main drivers for creating a successful online learning platform?**

One of the main drivers identified in this study is to focus on the target group. The users must be aware about and willing to use the platform to be able to stay motivated. Knowing the purpose of the activities is hence crucial to stay engaged and attain the benefits intended from participating. Further, the online learning platform needs to be designed with the target groups' needs, abilities and preferences in mind. It needs to be compatible with their ICT equipment and access, their cultural habits and their preferred features and functions.

An additional main driver is the insight that learning is an individual experience that requires variation and adaptability. The material, length of modules and the way of presenting the material needs to be varied to suffice as many users as possible. Further, another important aspect is to ensure that the users get continuous feedback to keep their motivation up and assist them in their learning. Having a reward to look forward to at the end of the course is also a vital part of this.

Finally, another main driver when creating an online learning platform is to maintain the sense of a community. The users need to get the same experience online as they would at an offline activity to ensure that they keep the trust for the organization and feel safe and part of the group. As in any classroom, there needs to be clear rules

and expectations on the platform. This further needs to be supported by having help available through clear instructions, technical support functions and teaching assistance.

2. What would make university students in Tanzania use online learning?

The main objective for using online learning discovered in this study is for the students to be able to educate themselves within subjects of interest; education that they cannot access otherwise due to cost, distance, time and/or availability. Further, an interesting insight that was found is that being present at an online learning platform creates the opportunity to connect with people sharing the same interests, something believed to be both fun and important. Moreover, an incentive for using online learning identified in the study was that everything today is moving towards being online and that it is therefore only logical that education does the same. By pursuing online learning, you ensure usage of ICT and thereby improve your ICT skills and create a habit of using it.

One major opportunity with online learning in this context is that it provides flexibility as it is geographically and timely independent. The students in Tanzania often have busy schedules with work, school and daily chores at home. They would therefore benefit a lot from not having to travel to a certain place at a certain time, but rather perform their studies when and where it suits them best. Being enrolled in an online learning course and being part of a virtual class would also encourage continuous learning and participation.

In addition, online learning opens up for the opportunity to access a lot of more material and courses than available locally. The case study showed that most of the students are already online in search of material that could help them attain knowledge and learn new abilities. Further, it was clarified in this study that the students see an opportunity to easier track their achievement and progress when being part of an online course.

A challenge for the students is to obtain the digital literacy that is required in order to perform online learning. All students in this case study had sufficient ICT skills to complete the prepared course in Learnifier, but that does not mean all students in Tanzania do.

The main challenge identified in this study is connected to the lack of online learning platforms adapted to the student's situation. The study highlighted that existing online learning courses often are American and thereby tend to be too expensive as the price is not adapted to the local market. It is also important to notice that English often is the second or third language of these students, hence the language must be adapted to that fact. Further, existing online learning platforms tend to require a lot of data and stable internet connection, something the students in Tanzania do not always have access to or cannot motivate themselves to use and pay for.

8.2 Recommendations to the Organization

The authors recommend that Help to Help starts initiating blended learning for their Academy program students in Tanzania, i.e. adding online learning as follow up education. Below general remarks are given based on the findings of the study as well as a requirements specification for the organization to proceed with.

8.2.1 General Remarks

In the following section, general remarks that are important to consider for the case organization are stated.

Keep Investigating Willingness and Ability

Keep investigating the attitude and abilities of the target group to ensure that the prerequisites of the target group are fully known and continuously updated. This even though awareness and interest of online learning showed to be great in this study, as it is important to remember that the participants had limited practical experience from it.

Ensure Mobile Compatibility

Ensure that the online learning platform is compatible with mobile usage as mobile access is high among the target group and mobile learning appreciated.

Do not Neglect the Planning Phase

In a short perspective, make sure to plan thoroughly before initiating online learning. Decide on the time concept of each course, what requirements that are necessary to set up and plan for support functions before exposing the students to the online learning platform. In a longer perspective, consider attaining in house competence about online learning and the platform. This to be able to develop and conduct this function independently and to be able to support and provide instructors for the users.

Work Iteratively

Repeatedly address the target group and their expectations and needs. When adding content and features to the platform, test it iteratively with representatives from the target group in order to create a good solution without wasting resources.

Maintain the Organizational Community

Maintain the feeling of a community on the platform by creating trust through for example the use of the organization’s logo, colors and existing communication

channels. Connect the platform to the existing community by educating the students that attend the physical activities about online learning, the online learning platform and the benefits of engaging in this.

Transfer Offline to Online

Ensure that there are many communication options available on the platform and that the users are able to help each other, follow each other and support each other's progress. Do not lose the elements of variety, entertainment and continuous improvement that traditional education emphasizes just because you are going online. For example, the habit of taking a break with your peers in school could be transferred to a break online through a video chat at the platform, which would be a fun and social element of the course and contribute to maintaining the sense of a community.

8.2.2 Requirements Specification

Below, the findings from this thesis are summarized in a requirements specification for the case organization. The specifications have been divided into critical, key and additional specifications based on their character, relevance and reliability. Critical specifications, see table 8.1, include aspects that are necessary to be able to conduct online learning at all. Key specifications, see table 8.2, illustrate aspects that are important to consider to make the online learning platform successful. Finally, the additional specifications, see table 8.3, are aspects that can be considered as beneficial addons.

Critical Specifications

Table 8.1. Critical specifications
Table by authors.

Requirement Name	***Requirement Actions***
Automatic Saving	Automatic saving function in place
Compatibility	Platform works with all operating systems and versions Platform works with all devices and screen sizes
External Reward	Completing a course should be rewarded, preferably with a Certificate
ICT Access among users	Access to reliable Internet Access to Electricity Access to ICT equipment

Interaction and Communication	Various communication options available on the platform (e.g. chat, discussion forums and/or email) Backup communication channel should be in place (e.g. WhatsApp group)
Introductory Video	An introductory video should be in place for the students when entering the platform for the first time. 5-10 minutes long Should also be available in text Preferably be self-made (by the organization)
Platform Language	English
Security on the platform	Registration required Strong passwords encouraged Stated rules on the platform Thorough Terms & Conditions available The organization's logo, colors and contact information available and visible
Training and Support	Introductory training of the platform for instructors and students is necessary Stress the benefits of ICT Technical Support should be available
Willingness and Ability among users	Autonomous usage possible Basic digital literacy Interest to use online learning

Key Specifications

Table 8.2. Key specifications
Table by authors.

Requirement Name	***Requirement Actions***
Automatic Triggers	Automatic triggers for teachers and students regarding incomplete assignments, low participation etc. Notifications should not be set by default, but be encouraged for the students to activate
Content	Interface is easy to update and edit with new content and information Standardized content with options to customize Updated and relevant content
Data Usage	Works with weak internet connection Uses a low amount of data

Design	Platform should use clear and subtle colors (e.g. black and white with the option to change color on small details)
Feedback	Feedback should be as instant as possible when conducting an activity Feedback should be adapted to the result given Feedback should be encouraging, e.g. using clapping sounds or animated stars A summary of your results should be generated each week An accumulated result should be given at the end of the course
Instructions	Basic instructions for every new activity or feature available A summary of the purpose of the course in the beginning A short summary of the purpose of each module at the initiation of it
Instructors	Instructors should be present at the platform There should be someone to ask regarding the material There should be someone to ask regarding administrative or technical issues Support should be available for those that need extra assistance or time for the assignments
Language	Simple language Short, precise texts Spelling check function that underlines misspelled or grammatically incorrect words (i.e. not autocorrect)
Learning	Various learning methods should be used (reading, listening, watching) The course material should be challenging There should be clear expectations regarding the student's participation and contribution Deadlines should be used to motivate learning
Profile Options	Profile for each participant with mandatory information about name and age and an optional profile picture
Quizzes and Examinations	3-4 questions are a good length on a quiz Should be possible to retake the quizzes and when doing so the questions should be presented in a different order At the end of each module there should be a final test which you cannot retake
Study Journal	Possibility to withdraw study journals for each student showing their results and completion status
Use of Visuals	All texts should be accompanied with at least one picture (or other visual) Videos should not be longer than 5-10 minutes Material in videos should also be available in text Self-made material creates exclusiveness

Additional Specifications

Table 8.3. Additional specifications
Table by authors.

Requirement Name	***Requirement Actions***
Cost of the Platform	Possibility to pay little at a time rather than all at once Option to choose to pay per month or per course
Customizability	Option to choose language on the platform Option to choose colors on parts of the platform
Difficulty Levels	Several levels of difficulty to choose from (within the same course/subject) Clear requirements (e.g. needing to pass module 1 to move on to module 2)
Engagement	Using gamification (games, high scores, challenges
Module Length	Should be flexible to distribute time differently over the course Various number of activities in each module
Offline Alternative	Offline alternatives available Downloading of material possible
Support for Privacy	Enabling a way to remain anonymous at the platform
Uniformity	Everything related to a workshop should be available on the platform (application, information, material).

8.3 Contribution to Theory

This study has foremost contributed to online learning theory. This by a further unravel of the definition of online learning, how it has evolved and the opportunities and challenges that are present today for this target group in Tanzania. It has further contributed to digital literacy theory by giving insight to the digital setting in Tanzania, the access to ICT that is available and what is required and desired for initiating online learning in this context. These results can give hints to the adaptability of these conclusions on other target groups with limited ICT access, but not the full picture.

Moreover, this study has contributed with an approach to how one can investigate this type of question. The pre study framework and the identified parameters from the pre study can be used as inspiration when further investigating online learning. Likewise, the case study method performing online interviews with assistance of the 'share screen' function can be used as inspiration for similar studies that are limited by physical distance.

8.4 Discussion of Limitations

One limitation to this study is the representativeness of the target group as the case study interview sample was rather low. However, this sample had an even distribution of men and women as well as a good spread of ages within the age span (18-35 years old). Further, the interviewees studied or had studied different subjects and had attended different Help to Help Academy activities, whereas these aspects are not believed to have had a significant effect on the results. However, one characteristic that could have affected the conclusions drawn from the case study is that a high number of respondents in the questionnaire had attended an IT-related activity. This could have influenced the results regarding IT-confidence and willingness, which was taken into consideration by the authors.

The occurrence of the COVID-19 pandemic compelled the authors to alter the case study, which could have affected the results since the preferred method could not be executed. The situation with the pandemic could also have affected the participant's responses: In one way, the students could have been more positively set to online learning as the pandemic have caused schools and universities to close and transfer to online education. On the other hand, the pandemic might have caused worry and fear, which could have influenced the interviewees and their attitude. Further, conducting an online questionnaire and online interviews might have discouraged participants that feel insecure about online usage and the representation of those with less experience, skill and interest in the target group might therefore be limited.

The authors were thorough in clarifying the purpose of the study and asking many open and general questions to ensure that the interviewees answered as truthfully and unbiased as possible. There are however some limitations to the findings due to the nature of the interviews. One limitation is the possible risk of the interviewer effect, where the interviewees might have modified their answers to please the interviewer due to cultural or gender superiority or factors of embarrassment. Another possible risk is that the answers were affected by the online learning module in Learnifier that the interviewees tested. Their focus might have shifted to evaluating that specific platform instead of online learning platforms in general. In addition, there might be some limitations to the reliability of the interviewees' answers, as it is easy to claim to want to use and pay for an online learning platform, but more difficult to commit to it when actually faced with the opportunity.

Further, the majority of the participants of the case study stated that they feel gratitude towards the case organization Help to Help due to the opportunities they offer. Some might therefore have modified their answers to what they believed the organization wanted to hear, instead of saying their initial thoughts. However, overall the authors experienced that the respondents aimed to provide honest answers and feedback.

8.5 Suggestions for Future Research

This study has, especially in this period of the Covid-19 pandemic, emphasized the need for and importance of online learning. Many parameters investigated in this study would however require more research in order to be able to draw broader conclusions. The occurrence of each parameter in the reviewed theory, as illustrated in the pre study, could guide which parameters that need further investigation.

Furthermore, there were parameters that were excluded from the case study due to limitations caused by the Covid-19 pandemic as well as due to limitations in time and resources. These could be researched further. The originally planned case study execution, presented in section *Appendix C2*, could also be beneficial to take inspiration from when executing future research as the authors believed this to be the best approach when investigating this subject.

Below, suggestions of future research for Help to Help and this type of online learning initiation project, is presented:

- Research how to work from a requirements specification
- Research and test different existing online learning platforms
- Research most common mistakes when conducting online learning
- Research implementation strategies
- Conduct a similar study with the Academy students from Uganda and Kenya to get insight on how their circumstances and requirements differ from the students in Tanzania.

8.6 Final Remarks

In the introduction, two main topics were discussed: the importance of education and the possibility of ICT to make education more accessible. While few tend to doubt the importance of education, there is still a need for more research regarding how ICT can be incorporated to it, especially in environments where accessibility and skills is not a given. This study verified that a more nuanced picture of the current ICT opportunities worldwide is required, both on an individual and a national level. The insights of the digital circumstances for this target group further highlighted that the old conception of developed and undeveloped countries, just as suggested by Rosling, Rosling and Rosling-Rönnlund (2018), needs to be reassessed.

What is especially interesting, is that even though online learning has become a major success globally, this thesis has proved that there is still a great lack of studies about online learning based on the users' needs and wishes. Indeed, there are studies regarding how online learning could be formed and conducted, what basic requirements there are and why it could be a great solution, but almost none of them has the user in focus. Additionally, this thesis has highlighted the difficulty of investigating a concept that lacks one commonly accepted definition. Even though greatly mentioned, there is an infinite avoidance of discussing exactly what online learning entails and what it is.

Finally, the authors hope to have inspired researchers to conduct similar studies as well as raised insight to that prejudices sometimes need reevaluation.

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P7, Help to Help Academy student. Online interview through Google Hangouts. April 9th, 2020.

Appendices

Appendix A - Interview Guides

Appendix B - Questionnaire

Appendix C - Frameworks

Appendix D - Excerpt from Learnifier

Appendix A - Interview Guides

A1 - Pre Study Interview Guide: Help to Help staff

A2 - Pre Study Interview Guide: Company Representatives

A3 - Case Study Interview Guide

A1 - Pre Study Interview Guide: Help to Help staff

Questions

1. Could you list all things you *know* are crucial for an online solution to be used by young people in Tanzania?

2. What do you think are basic needs necessary to be able to use online material?

3. From Help to Help's perspective, what do you need from an online learning platform for it to be usable?

4. What is important from the view of the instructor/content provider?

5. From the perspective of the target group (Academy students), what do you think are important parameters for an online learning platform to be usable?

6. What is important regarding design for an online learning platform?

    a. What visuals do you think are necessary for the students to want to navigate on the platform?
    b. How do you think they want to profile themselves (anonymously, with pictures, personally)?

7. What functions and features do you believe are important for the students?

    a. What language options do you think are required?
    b. What type of content do you think should be available?
    c. How should the content be presented?
    d. What do the students need to get motivated?

8. What do you think are the limitations for the students to use an online learning platform? For example: costs, access, attitude, digital literacy.

A2 - Pre Study Interview Guide: Company Representatives

Questions

1. Could you list all things you believe are crucial/important for an online solution to be used by university students in the age of 18-30?
2. What do you think are basic needs necessary to be able to use online material?
3. What is important regarding design for an online learning platform?
4. What functions and features do you believe are important for the students?
5. What do you think is the best way to motivate the students to use online learning?
6. How do you manage to maintain the students' interest?
7. Have you noticed something in particular that is extra important to consider when conducting online learning?

A3 - Case Study Interview Guide

The following questions were categorized according to different themes, where the parameters covered in each theme are specified in the brackets.

The case study interviews started with a short introduction from the interviewers regarding:

- The purpose of the study and the interview
- The interviewee signing the consent form
- Information about anonymity and recording of the interview
- Information about the time frame and steps of the interview

Introduction

1. Can you please present yourself a little (name, age, what you study)?

2. Which Help to Help Academy activity have you attended?

3. Have you tried to learn something using the internet before? (By watching a video, reading articles online or doing an online quiz - either on your computer or phone)

    a. Would you like to tell us a bit more about what you learnt and how?

Evaluation of Testing the Platform (parameter 29)

4. How did you experience using this platform?

    a. Was it easy or hard to know what to do?
    b. Was the material understandable or not?
    c. Did you like or not like the quiz?
    d. Was it important/not important for you that you got the results from the quiz immediately?

Application and Access (parameter 33)

5. How was your experience applying for the Academy activity you attended?

    a. Do you feel that you received enough information from Help to Help before the activity? (Why/why not?)
    b. Do you have access to the material from the activity now (afterwards)?

6. How would you like it if everything connected to the activity (material, application, information) was available at one website?

    a. Why/why not?

Learning Preferences (parameter 5, 7, 9, 12, 14, 34)

7. How do you like to learn? *(By reading, listening, discussing, watching...?)*

8. How do you feel about watching videos/visual animations when learning something?

    a. In what situation do you prefer videos/visual animations?

9. When for example watching a video, is it important/not important to you that all that material is also available in text?

    a. Would you like it if this was accessible?

10. How do you feel about having deadlines?

11. Do you prefer or not prefer to know why you are doing something?

12. How do you feel about having clear requirements?
For example: Do you like or dislike when you need to pass a certain amount of questions to be able to move on to the next part?

13. How do you feel about having different difficulty levels to choose from when doing an online course? *(For example, one easier and one more challenging alternative)*

    a. Why/Why not?

14. Imagine that you have attended a Help to Help Academy activity and now will continue to learn about the same subject online. How much time would you be willing to spend on this per week?

    a. Do you prefer a few long sessions or many short sessions?
    b. (If not mentioned, ask them to specify what short/long means to them.)

Cost (parameter 16)

15. Would you be willing/not willing to pay for using an online learning platform?

    If yes,

16. Would you prefer to pay a certain fee per week or month for all material, or would you prefer to have free access to some material but have to pay a premium to access all material?

17. How much do think you would be willing to pay:

    a. per week or month?
    b. for premium?

User Possibilities (parameter 6, 17, 18, 19, 20, 46)

18. Is there anything important for you as a user to have or be able to do at the online learning platform?

    a. Have your own profile?
    b. Have a profile picture and presentation of yourself?
    c. That your results are saved on your profile?
    d. That your profile keeps track of your progress?
    e. Decide background color and design at the online platform?

19. How do you feel about anonymity when being on the platform?

    a. How - completely or when you decide to be? *(when asking questions for example)*?

20. How do you feel about being able to see/follow/talk to others on the platform?

Platform Functions (parameter 26, 44, 45)

21. How would you like to communicate with others on the platform? *(For example, through chat, email, open discussions, video sessions?)*

    a. Does this depend on what you want? *(For example, is there a difference between asking a teacher for help or discussing with a friend?)*

22. How do you feel about using the internet to access and use the platform?

    a. Are you able/not able to?

23. Do you think that you will use the platform more or less if it can be used offline?

24. Do you think it is necessary or not necessary that the online course has a spelling check function? *(For English)*

Platform Design (parameter 35, 38, 39)
The following material was shown to the respondent by the authors sharing their screen.

Pictures representing different color schemes of the platform:

Figure A.1 Four different color schemes for a platform start page
Illustration by authors.

25. Which one of these alternatives did you prefer?

a. Why do you think you prefer this one?

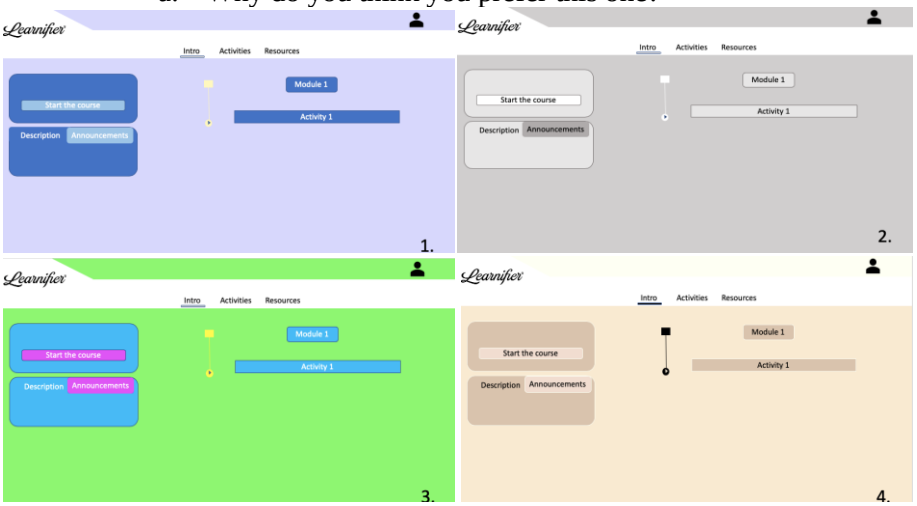

Figure A.2 Four new color schemes for a platform start page
Illustration by authors.

26. Which one of these alternatives did you prefer?

a. Why do you think you prefer this one?

Pictures representing different layout alternatives:

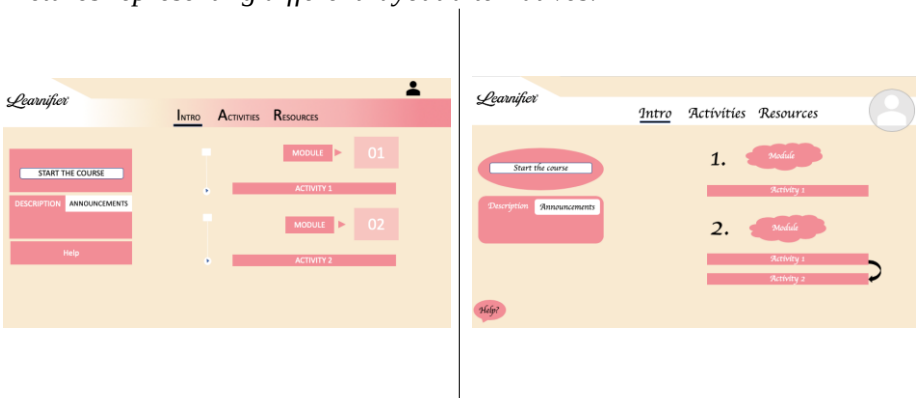

Figure A.3 Two different layout alternatives for a platform start page
Illustration by authors.

27. Which one of these alternatives did you prefer?

a. Why do you think you prefer this one?

Language and Instructions (parameter 27, 34)

28. If you could choose the language for the platform, which language would you choose?

29. Would you like instructions specifically to be in both English and Swahili or is either enough?

30. What are good instructions according to you? *(Long, short, animated, concise)*

    a. What is long/short to you?

31. Would you like figures/animations to guide you on the platform or do you prefer to have written instructions?

Engagement and Motivation (parameter 37, 50, 51, 52)

32. Do you usually trust or not trust sites online?

    a. Why/Why not?

33. Do you think that feeling connected to Help to Help and other members while using their online learning platform would be important for you?

    a. What would make you feel connected?
    (Help to Help colors/logo, Help to Help staff - contact options, connection to those you went to the Academy activity with…?)

34. How do you feel about receiving immediate feedback on your assignments/tests for example?

    a. Does it depend on the type of test?

35. What do you think would make learning online fun?
(games, competitions, high scores, rewards)

36. What would motivate you to complete an online learning course?

37. Do you think it is important/not important to receive an external reward?

a. Why/why not?
b. What would you like?
For example: a certificate, money, a guaranteed spot to a Help to Help Academy activity...?

38. Is there anything else you would like to add on the subject of learning online?

39. Finally, do you have any questions for us about the study or anything else we have discussed?

Thank you!

Appendix B - Questionnaire

We are two students from Sweden writing our master thesis about how to expand the Academy program together with Help to Help. You have received this form as you have attended a Help to Help Academy activity within the last two years. It will be very helpful if you can answer all questions as correctly as you can!

You will remain completely anonymous!

Your answers will only be available for us two and will be analyzed to be used in this master thesis.

If you wish to contact us with questions, or want to view the final result, please see our contact information at the end of this form.

Asante, Isabella Bergvik and Sofia Johansson

Introduction

Your age (please write with numbers): _____

What is your gender? (please mark one)

- ❑ Female
- ❑ Male
- ❑ Don't what to share

Academy Program

What Help to Help Academy activity have you attended? (please select all activities you have attended)

- ❑ IT-boot Camp/TGEE Boot Camp
- ❑ Mini IT-boot Camp
- ❑ CV Workshop
- ❑ Entrepreneurship Workshop
- ❑ Sustainability Boot Camp
- ❑ Company Visit
- ❑ Other: _____

IT Access

Do you have access to a computer? (please mark one)

- ❑ Yes, I have my own computer
- ❑ Yes, shared (at school or similar)
- ❑ No, I do not have access to a computer
- ❑ Other

What do you use a computer for most of the time? (please mark one)

- ❑ School work
- ❑ Entertainment (YouTube or social media)
- ❑ E mail
- ❑ Microsoft Office
- ❑ Other

Do you have access to a mobile phone? (please mark one)

- ❑ Yes, I have my own mobile phone
- ❑ Yes, I share a mobile phone with family/friends
- ❑ No, I do not have access to a mobile phone
- ❑ Other

What do you use a mobile phone for most of the time? (please mark one)

- ❑ Calling and texting
- ❑ Using the internet
- ❑ Social media applications
- ❑ Games
- ❑ Other

How often do you use a computer/mobile phone? (please mark one)

- ❑ Every day, more than 2 hours
- ❑ Every day, less than 2 hours
- ❑ A few days per week
- ❑ Once a week
- ❑ Once a month

Do you have access to internet? (please mark one or more)

- ❑ Yes, at home
- ❑ Yes, at school
- ❑ Yes, at another place (internet café)
- ❑ Yes, on my mobile phone
- ❑ No, I do not have access

If you have access, how good is the internet connection? (please mark one)

- ❑ Low (stops working, slow)
- ❑ Low/Middle (stops working sometimes, sometimes slow)
- ❑ Middle (sometimes fast and sometimes slow)
- ❑ Middle/High (works well most of the time, fast most of time)
- ❑ High (works well and fast)

Do you pay for internet yourself? (please mark one)

- ❑ Yes
- ❑ No
- ❑ Sometimes

If you pay for internet, how much do you pay? (please write per hour or per day or per month)

_____

How good is the electricity power where you use a computer? (please mark one)

- ❑ Bad (stops working often)
- ❑ Middle (stops working sometimes)
- ❑ Good (works almost always)

IT interest

I feel confident in using IT (computer, mobile, internet)? (please mark one)

Strongly Disagree				Strongly Agree
1	2	3	4	5

Would you use an online learning platform? (please mark one)

- ❑ Yes
- ❑ No
- ❑ Maybe

Would you be willing to pay to use an online learning platform? (please mark one)

- ❑ Yes
- ❑ No
- ❑ Maybe

Appendix C - Frameworks

C1 - Results of Pre Study

C2 - Original Case Study Plan

C1 - Result of Pre Study

The following table shows the results of the pre study using the framework presented in section *5.1 Composed Pre Study Framework*. The three levels of frequency were represented as following:

Low: Mentioned in 1 or 2 of the references

Moderate: Mentioned in 3 or 4 of the references

High: Mentioned in 5 or more of the references

Table C.1. Pre study results
Table by authors.

Dimension	*Category*	*Parameter Reference*	*Parameter Name*	*Occurrence*		
				Low	**Moderate**	**High**
ICT Infrastructure	Internet	1	Reliable internet connection			X
		2	Low cost of internet		X	
	Electricity	3	Stable power distribution network		X	
	Access	4	Access to ICT equipment		X	
Platform Usability	Content	5	All material available in text	X		
		6	Interactive, impressive and engaging content			X
		7	Several levels of difficulty	X		
		8	Updated and relevant		X	

			content			
		9	Combination of learning methods		X	
		10	Challenging course material	X		
		11	Questions that motivate thinking	X		
		12	Clear expectations and requirements			X
		13	Equal Content	X		
		14	Adapted length of modules	X		
		15	Standardized content that can be customized	X		
	Cost	16	Low/no cost of accessing the platform		X	
	Opportunities	17	User customizability (color, pictures)	X		
		18	Support for privacy and anonymous using	X		
		19	Non-anonymity	X		
		20	Interaction and discussion possibilities			X

		21	Registration required (only Help to Help students)	X		
		22	Autonomy (being able to use the tool on your own)	X		
	Compatibility	23	Work with all operating systems (all versions)		X	
		24	Work on all devices and screen sizes			X
		25	Android compatible	X		
		26	Offline alternatives available		X	
	Easy to Use	27	Language options		X	
		28	Simple language		X	
		29	User friendly			X
	Content Provider	30	Possibility to withdraw study journals/results	X		
		31	Easy interface to update and edit content		X	
		32	Automatic communication and triggers (for teachers and students)	X		
	Everything on the same place	33	Everything related to a workshop	X		

			should be on the platform			
Platform Design	Layout	34	Use of visuals			X
		35	Lively colors	X		
		36	Short, precise texts	X		
		37	Trustworthy, belonging environment		X	
		38	Young, social media alike, look		X	
		39	Professional, impressive design	X		
		40	Dynamic homepage with an overview of your work	X		
	Platform functions/ characteristics	41	Few tools and links	X		
		42	Works with weak internet connection	X		
		43	Uses low memory/data		X	
		44	Automatic saving function	X		
		45	Spelling check function	X		
		46	Having a profile	X		
Student's Characteristics	Experience/ previous	47	Awareness of ICT and its	X		

	knowledge		benefits			
		48	Basic digital literacy	X		
	Attitude	49	Willingness to use ICT	X		
Intrinsic and Extrinsic Motivation	Gamification	50	Engagement through gamification	X		
	Feedback	51	Instant feedback		X	
	External rewards	52	External rewards (certificates, financials...)		X	
System Support	Introductory training	53	Training in the system (students and teachers)		X	
	Technical support	54	Technical support available			X
	Support and Skills of Instructors	55	Pedagogical skills	X		
		56	Presence of instructors		X	
		57	Publisher support	X		

C2 - Original Case Study Plan

In table C.2 below, the authors original plan and intention on how to proceed with the results from the pre study are presented. This includes the distribution of the 57 parameters identified in the pre study, using the parameter references in table C.1 in *Appendix C1*.

Table C.2. Impact for the case study (original plan)
Table by authors.

Further Action	***Selected Parameters by the Authors***
Questionnaire	16, 47
Interviews	7, 9, 12, 14, 16, 17, 18, 19, 20, 26, 27, 29, 33, 37, 44, 45, 50, 52
Testing	5, 13, 20, 28, 29, 34, 35, 36, 36, 39, 40, 41, 46, 51, 53
Excluded from the Case Study	1, 2, 3, 4, 6, 8 10, 11,15, 21 22, 23, 24, 25, 30, 31, 32, 42, 43, 48, 49, 54, 55, 56, 57

Note: Some parameters may appear under several further actions with the intention to be handled in both ways.

The parameters that were considered to need further investigation and validation, were split up into two categories: Interviews and Testing. This was based on the author's judgement of appropriateness and feasibility as well as the nature of the parameter itself. The interviews and workshops would have been conducted in Dar es Salaam, Tanzania. Ten interviews would have been conducted individually with respondents from the target group. Questions regarding the parameters stated in table C.2 under "Case Study: Interviews", would have been asked with the purpose of gaining deeper understanding of the target groups' thoughts on these aspects.

The workshops would have been conducted in four different groups with five people from the target group in each. The desired execution would have been that all groups conducted all tests, however limitations in time and resources would have made this difficult, whereas the plan was for the groups to conduct different tests. All tests, including follow up questions, were however thought to be conducted by at least two of the groups to ensure representation and possibility to draw conclusions. Some tests would have been conducted through the platform Learnifier where modules would have been designed to include the parameters stated under "Case Study: Testing" in table C.2.

Further, while in Tanzania, an observation of a Help to Help activity was intended to be made. The observation had the intention of gathering insights about the behavior of the target group in an educational situation as well as to analyze their ICT-related behavior. As Denscombe (2017) mentions, an observation schedule is appropriate to align the observation of the researchers and ensure that the same things are noted in a correct manner and systematic way. The observation schedule, seen below in table C.3, was intentionally created for this purpose. The themes and further the objects of observation were decided upon based on the overall areas of investigation of this case study. This framework can be used in future studies.

Table C.3. Suggested observation schedule
Table by authors.

Theme	***Object of Observation***	***Note***
Digital Literacy	Do the students know how to use the computer?	
	Do the students seem comfortable using a computer?	
	Do the students seem to be comfortable when writing on a computer?	
	Do they ask for help on using the computer? What do they ask about?	
Classroom Behavior	Do people discuss during the lesson?	
	Do people ask for help (teacher) in full class?	
	Do people ask for help from their peers?	
	Do the students collaborate on tasks or do them individually?	
Teaching Style	Do they use digital tools? (videos, slides etc.)	
	Do they use reading as a teaching tool?	
	Does the teacher tell stories?	
	Does the teacher give real life examples?	

Appendix D - Excerpt from Learnifier

Below, the text used in Activity 2 in Learnifier is presented, namely the article *'It is so much more than cooking'* written by Zoe Fenson in 2019.

It is so much more than cooking

Picture the inside of your fridge — stuffed or bare, messy or clean. Without actually looking inside, name three foods that you know are in there. (Off the top of my head: eggs, Little Gem lettuce, and pre-shredded cheddar cheese.)

Think about how much of each item you have. (A dozen plus three, about half a head, one unopened bag.) Think about when they were purchased, and how soon you'll need to use them before they go bad. (The eggs are all right — I bought them a couple weeks ago. The lettuce needs to get used before the weekend, for sure. The cheese … it's unopened, but I don't remember when I bought it. What's the sell-by date?)

Think about what meals you might be able to make with each of those ingredients. Think about how many portions those meals will make, and how long the leftovers will keep. Think about what other ingredients you'd need to acquire in order to make those meals. Think about how much those ingredients cost, and how much money you have available to buy them. Think about who else will be eating with you, and what they do or don't like, and what they can or can't eat. Think about how long it'll take to cook. (How long until mealtime? How hungry am I? How hungry is everyone else?) Think about the inevitable sink full of dishes, and who will do them, and how long after the meal they'll get done. Think about doing this all over again every time you cook.

Feeding ourselves and others involves an awful lot of work. Even in our food-obsessed American culture — where recipes go viral on social media, and people watch other people cooking on TV for fun — much of that work is explicitly rendered invisible. We talk about recipes, and eating, and sometimes about cleanup, but we don't discuss all of the other labor, both physical and mental, that's bundled into the single word "cooking."

As an avid home cook, I get great pleasure out of turning raw ingredients into delicious and nourishing food. I love planning elaborate centerpiece meals, or making something quick and tasty out of whatever's in the fridge. By choice, and also out of habit, I've taken on nearly all of the food prep in my household. I elbow everyone else out of the kitchen, or backseat-cook over their shoulders. I'd long assumed that I was getting more out of it than I was putting in.

Then, about a year ago, I had a sobbing meltdown in the kitchen in front of my spouse. It had started out innocently enough: He'd invited a friend over for dinner,

but I was on a high-pressure work deadline and had no time or mental energy to spare. "I'll make dinner!" he said. "You don't have to do a thing."

That evening, he waltzed through the door from work, bubbling with enthusiasm. I met him in the kitchen, exhausted and hungry. "Okay, I'm ready to start cooking," he said. "What do we have in the fridge?"

I stared at him for a moment and felt myself crumple in frustration. The strength of my reaction to this question surprised even me. Why on Earth was I so upset? It took some deep breaths, and a bit of damage control that evening, and a number of halting, stumbling conversations over the course of the next few months, but eventually I put my finger on it.

In offering to make dinner, my husband, with the absolute best of intentions, had focused on the one thing he'd promised to do: grab a pot and a pan, put something in it, and make edible food. But what I'd wanted him to do was much more complex, so ingrained in my experience of cooking that I didn't even think to articulate it. I wanted him to pick up the baton. To check what ingredients we already had, and what might need using up. To plan out a meal that would meet everyone's dietary needs and preferences (including a balanced amount of protein and starch, and at least one vegetable). I wanted him to look up recipes, and make a grocery list if needed, and stop by the store on the way home. I wanted him to make food appear without me having to think about it.

I wanted him to make dinner. And it hadn't even occurred to him to look in the fridge before he left for work that morning. This wasn't entirely his fault: I realized that he didn't want to guess at the cooking process on his own because I had so thoroughly claimed my title as the keeper of the food.

For those of us who cook frequently, planning and strategizing for meals becomes background noise. It's part of the mental load, the running list of small decisions and knowledge required to maintain a household. And as with so much of that mental load, cisgender women like me end up shouldering the lion's share. We are trained to reflexively and uncomplainingly take on as much of the mental load as we can possibly bear. And cooking is still a highly feminized pursuit; it's a skill girls are implicitly expected not only to learn, but enjoy doing. To be feminine, we are told, we must be hospitable, nurturing, giving — qualities that are intimately bound up with feeding those around us. If a meal isn't balanced and complete, if someone isn't happy with their portion, if it costs too much or doesn't land on the table on time, it feels like a personal failure.

Of course, I know plenty of cis women who have little or no interest in cooking, and a smaller number of cis men who happily take on food prep duties for their entire households. But when I hear a woman admit that she doesn't cook, it's usually with embarrassment or shame in her voice; when I hear a man say that he cooks for his family, it's a point of pride, a marker of going above and beyond.

Because women are expected to know how to cook by the time we reach adulthood, we tend to be better, or at least more practiced, at it than our male partners. When you're better at something, it seems only natural that you be the one to do most of it. And if you're doing the cooking, then it's only natural that you do all the other associated labor too. Because we have no separate name for that labor — it's all just "cooking" — those who have internalized the mental load define it one way, and those who have been allowed to dabble see it very differently.

When my husband volunteered to do the cooking that evening, I thought he was allowing me to free up some of my cognitive resources, so that I could apply them elsewhere. He thought he was just in for a bit of manual labor. We were speaking different languages.

As far as straight cis marriages go, mine is pretty darn egalitarian. I'm proud of that. And yet, when it comes to food prep, we've slid neatly into our societally defined roles: me as the boss of the kitchen, and my husband as the person who takes directions and otherwise stays out of my way. I'm the one who remembers which of our loved ones is allergic to black pepper, which store stocks the brand of pretzels he likes, how long ago we bought that jar of peanut butter. But neither of us had realized the mental toll of this dynamic, until that evening.

I'd love to say that was the last time we had this particular argument — that we've hashed it all out now. But the mental load of food prep is still lopsided in our house. I still like to cook more than my husband does; I'm still the keeper of what's in the fridge. But at least now we can recognize and name the forces at work — just one more step towards balance on our literal and metaphorical plates.