



LUND UNIVERSITY
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e-Learning in the Aftermath of the 2020 Pandemic

An Analysis of Lund University Response

Master Thesis 15 HEC, Course INFM10 in Information Systems

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Year : 2021

e-Learning in the Aftermath of the 2020 Pandemic: An Analysis of Lund University Response

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PUBLISHER: Department of Informatics, Lund School of Economics and Management,
Lund University

PRESENTED: June, 2021

DOCUMENT TYPE: Master Thesis

FORMAL EXAMINER: Christina Keller, Professor

NUMBER OF PAGES: 55

KEY WORDS: e-Learning, COVID-19, Contact Learning, Higher Education, Lund University, Online, Pandemic, Pedagogy, Sweden, Teaching

ABSTRACT (MAX. 200 WORDS):

COVID-19 pandemic caused massive disruption to livelihoods and the education sector was not spared as forced closures of academic institutions became widespread triggering a shift to e-learning. In response, governments swiftly moved to confinement, lockdown, or curfew measures to strongly curtail travel and movement of people. Educational activities, among other facets of life, came to an abrupt halt. During this adversity, Higher Education Institutions (HEIs), the world over, and particularly Lund University in Sweden, took it upon to make sure that teaching and learning is not completely disrupted with the use of technology in COVID-19 times. This paper highlights on major impacts of COVID-19 on HEIs and sought to determine how Lund University responded. Learning and educational levers of power alongside HEIs took steps to ascertain continuity in teaching, research, and learning throughout the pandemic. Alternative contemporary approaches to learning began trending aided by computing and technology – this study has explored on this and determined how successful it has been for Lund University during the pandemic.

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1 Introduction

The novel COVID-19 pandemic, which, within weeks led to the extraordinary anomalous health and socio-economic crisis which marked our times, severely impacted the entire higher education sector around the world. Indeed, COVID-19, a viral pandemic that affected everybody across the globe (Marinoni, Van't Land, & Jensen, 2020; Tapfuma, Xuelian, Mukundwa, Mollé, et al. 2021). It did impact on the individual level and on society at large. The health crisis quickly evolved into an economic, cultural, and social dilemma. Immediate responses were developed primarily to control and curb the spread of the infection, measures taken included the closure of countries' borders, lock downs, curfews, social distancing, sanitisation, use of masks, and the reestablishment of borders for both people and goods (Marinoni, Van't Land, & Jensen, 2020).

The measures taken had an immediate effect on higher education. They impacted, often dramatically, the conditions under which higher education, all-of-a-sudden had to perform research, teaching and learning, and what is now often referred to as 'emergency online education' (Marinoni, Van't Land, & Jensen, 2020); students needed assistance; staff faced unprecedented challenges, including job uncertainties and insecurity; university leaders had to reinvent how to run their campus operations (Marinoni, Van't Land, & Jensen, 2020). The consequences will be felt way into the future with psychologists taking on years of study to determine the effects. To envisage medium-and long-term scenarios, it is important to capture what happened, and the consequences for national and international students (Marinoni, Van't Land, & Jensen, 2020). Apparently, the future of higher education needed rethinking in many ways. International and multilateral cooperation within the higher education sector and with policymakers, communities, and other stakeholders alike (Marinoni, Van't Land, & Jensen, 2020). Most of the institutions were confronted with an abrupt instantaneous off-guard shift to online teaching and learning (also-known-as (a.k.a.) 'emergency online education') to respond to the need to continue teaching and learning activities and to engage and motivate students when social distancing measures were in place (Marinoni, Van't Land, & Jensen, 2020).

As World Health Organisation (WHO) put it, 2020 was a year without precedent (WHO, 2020a) following the outbreak of Corona Virus Disease 2019 (COVID-19) which led to a multitude of changes in our day-to-day lives the world over. COVID-19 impacted and affected everyone across the globe (Tapfuma, Xuelian, Mukundwa, Mollé, et al. 2021). Consequentially, the education sector was not spared, the government responded by issuing a statement to Sweden higher education institutions to provide distance learning until further notice (Ministry of Education and Research, 2020). Concomitant, this prompted the writer to investigate and analyse how Lund University responded facilitating e-Learning. Crises, exigency, and disasters can morph accustomed ways of learning transitioning to online (Thompson & Copeland, 2020). However, the shift should not miss other fundamental aspects for effective teaching and learning. In today's knowledge-based economy, education is not just for literacy, it has taken a new dimension because of the pervasive presence and influence of information technology across all areas of society, concomitantly resulting in e-Revolution (Ching, Poon, & McNaught, 2006).

Students are generally more technologically advanced than many teachers, tutors, or lecturers today, primarily because of them having grown in the tech-era, so to speak, putting instructors at a decided disadvantage in the lecture room (Jena, 2020). However, a student's love of technology also tends to distract him or her from his or her academic work, a huge detriment (Jena, 2020). When teachers do not have the techno-savvy to compete with those devices, by bringing education and technology together, it can be difficult to keep students' interest and attention to properly teach new concepts and, also for teachers to be effective in pedagogical delivery (Jena, 2020). This two-dimensional problem, student-teacher-tech dilemma, gets exacerbated when technology use becomes the only form available to educate, teach, and learn – sadly, COVID-19 set us out for this scenario.

During the coronavirus disease pandemic, prolonged closures of Higher Education Institutions (HEIs) resulted in a reversal of educational gains, limiting student's educational and vocational opportunities as well as their social and emotional interactions and development (WHO, 2020b). The longer a student stays out of college activities, the higher the risk of dropping out. Additionally, students who are out of college – and particularly female – are at increased risk of vulnerabilities (for example, subject to greater rates of violence and exploitation, forced or arranged marriage, and unplanned or unwanted pregnancy) (WHO, 2020b). Furthermore, prolonged closure of HEIs interrupt and disrupt the provision of, and access to, essential institution and college-based services such as counselling, sexual health (for example, P6-Project Sex promote sexual health on a physical, emotional, and social level), contraception, mental health, and psychosocial support (MHPSS) on matters related to stress, worry, anxiety, depression, transitional issues, and academic difficulties (WHO, 2020b). As the COVID-19 crisis became more protracted, there was need to ensure that concerned stakeholders had appropriate mechanisms and capabilities to cope with their evolving local situations – how did Lund University action this, that is the thrust of this study.

It is beyond debate that COVID-19 impacted and had strong hit on higher education not only in Sweden but the world over. According to Jena (2020) the Coronavirus disease severely affected educational systems across the globe by, destabilizing all educational activities – confinements, lockdowns, or curfews ceased educational activities (admissions, examinations, entrance tests) creating numerous challenges for the stakeholders as institutions closed down; caused mixed impact on academic research and professional development – negatively, researchers could not travel to collaborate locally and internationally complicating joint project and research work, scientific laboratory testing could not be conducted, positively, contrary to the negative effects academicians had more time at their disposal to improve theoretical research work (publishing journal articles and books) and acquainted on technological methods to sustain research, webinars and e-conferences trended as ways of sharing expertise among students and academicians; severely affected the educational assessment system – internal assessments and external examinations got suspended negatively impacting the candidates (students got stuck in the same grade, missing application deadlines for forthcoming academic year in other countries, employment and recruitment challenges) triggering a shift to online mode using various digital tools; reduced employment opportunities – interviews got postponed and worse still, cancelled, people got stuck as they could not travel back to their workplaces abroad. These views were also anchored by Bender (2020; CSSE, 2021).

Faced with these challenges HEIs had to adapt and adopt various strategies to face the crisis during the pandemic, the study sought to understand how Lund University went through this process to mitigate the negative effects brought about by Coronavirus disease. Governments rallied in support of learning institutions mobilising resources. We saw multiple launches of many virtual platforms with online repositories, e-books, educational television channels, radio broadcasts, and other online teaching and e-Learning materials (Jena, 2020). Internet became the new blood for survival, social media, e-Meeting rooms (Zoom, Google meet, Microsoft Teams) flourished. Information and communication technology (ICT) hyped beyond mention bursting the survival bubble in pandemic restrictive times – life went on.

As a precis to the problem under study, according to UNESCO, on 01st April 2020, schools and higher education institutions were closed in 185 countries, affecting 1 542 412 000 learners, which constituted **89.4%** of total enrolled learners (Marinoni, Van't Land, & Jensen, 2020). At the beginning of May 2020, some countries, experiencing decreasing numbers of cases and deaths, started lifting confinement measures (Marinoni, Van't Land, & Jensen, 2020). However, on 07th May 2020, schools and higher education institutions were still closed in **177** countries, affecting **1 268 164 088** learners, which constituted **72.4%** of total enrolled learners (Marinoni, Van't Land, & Jensen, 2020). At almost all HEIs, COVID-19 affected teaching and learning with two thirds of them reporting that classroom teaching has been replaced by distance teaching and learning (Marinoni, Van't Land, & Jensen, 2020). The shift from face-to-face (Contact Learning) to distance

teaching (Open and Distance Learning) did not come without challenges, the main ones being access to technical infrastructure, competences, and pedagogies for distance learning and the requirements of specific fields of study (Marinoni, Van't Land, & Jensen, 2020). At the same time, the forced move to distance teaching and learning offered important opportunities to propose more flexible learning possibilities, explore blended or hybrid learning or flipped classroom and to mix synchronous learning with asynchronous learning (Marinoni, Van't Land, & Jensen, 2020), *Figure 2 in Section 2.2* illustrates these e-Learning possibilities.

1.1 Aim, Objectives, and Purpose

The broad aim, intention, and aspiration of the research study as precisely put up is:

- To assess the adequacy of Lund University's e-Learning response to the pandemic from an Academic Staff's perspective.

The key issues to be focused on in this research project outlines the, *what, why, who, when, where,* and *how* questions. As derived from the research aim, the study objectives are:

- To explore the availability of teaching and learning resources in Lund University's response to the pandemic
- To determine the Academic Staff's view of e-Learning versus Contact Learning
- To identify pedagogical delivery challenges through Online Learning in comparison to Contact Learning.

The declarative succinct statement that summarises this research project's main goal providing some guidance in establishing, improved prediction; increased knowledge base; measurable change or improvement; a demonstration of social, organizational or institutional impact; understanding of complex phenomena; a test and evaluation of new ideas and theories; informed multiple stakeholders; development of new hypotheses and theories; and an understanding of past events (Newman & Covrig, 2013; Tashakkori & Teddlie, 2010), proclaims the study purpose motivated by the quest to build knowledge as:

- To pursue an inquiry into teaching and e-Learning in the Aftermath of COVID-19 at Lund University

1.2 Research Question

For this research study a funnel approach technique was applied to the research topic, decomposing it down to a research question that sought to improve knowledge as:

- How adequate is Lund University's response to the pandemic, to facilitate continuity in effective and pragmatic learning?

1.3 Importance

Today, students and youths are change agents comprising of future leaders and professionals, you name it. Any adversity proffers the chance to assist them learn, cultivate kindness, compassion, and increase resilience and bouncebackability while building a safer and more responsible community (Bender, 2020). Understanding the effects and measures to control and mitigate COVID-19 helps the next generation of leaders to face-up and come to terms with the consequences of corona virus. The paper addresses Higher Education Institutions' (HEIs) personnel and stakeholders alike to promote and uphold health safety standards in HEIs (Bender, 2020). The study is premised in Information Systems domain and it plays a key contributory role to the research in the field of Information Systems.

1.4 Limitations and Delimitations

The researcher was bounded by the COVID-19 pandemic controls and confinement measures, time allocated to conduct the study, financial resources, and that led the study to cover Lund University only. The study focused on academic staff opinion which is subject to change on the part of the respondents as they are determined by conditions prevailing at the time of study (Tapfuma, 2000) – it was a crisis driven phase.

On delimitations, the research study focused on Lund University and the sampled Academic and Teaching Staff's perceptions, opinions, and attitudes towards the pedagogical delivery of teaching and learning through modern technology in a pandemic situation.

1.5 Definitions

Adequacy – a state of being sufficient for the purpose concerned, not suggesting abundance, excellence, or even more than what is absolutely necessary. It is simply the state of sufficiency, equal to the requirements of the situation (Vocabulary.com, 2021).

Assessment – the act of judging a situation, thus, evaluating or estimating the nature, quality, ability, extent, or significance of (Vocabulary.com, 2021).

Connectivist Approach – an approach that takes learning as impacted through technology (Siemens, 2004). Learning needs and theories that describe learning principles and processes, should be reflective of underlying social environments (Siemens, 2004; Yurkiw, 2017), which is what connectivism theory does.

Contact Learning – campus-based learning also referred to as classroom learning (Anderson, 2008; Ching, Poon, & McNaught, 2006).

Effective – a state of producing or capable of producing an intended and desired result (Vocabulary.com, 2021).

Effective Learning – is the teaching process that requires understanding of how students learn, where and how learners have difficulty, what are their preferences in teaching and learning, and what practices are most effective for helping them progress toward more complex and sophisticated understanding (Hativa, 2000).

e-Learning – is the convergence of distance and campus-based learning that occurs through use of digital technology bringing a new meaning to terms such as 'schools without walls' (Ching, Poon, & McNaught, 2006)

Evaluation – a determination conducted in the process of action for the purpose of improving performance, thus formative evaluation (Hativa, 2000) for continuous process improvement. For this study, summative evaluation is not applicable.

Nomological Network – is a representation of the concepts (constructs) of interest in a study giving a view of construct validity, the observable manifestations, and the interrelationships among and between concepts (Trochim, 2020).

Open and Distance Learning (ODL) – open learning and distance education represent approaches that focus on opening access to education and training provision, freeing learners from the constraints of time and place, and offering flexible learning opportunities to individuals and groups of learners (Pityana, 2009; Gaskell, 2017).

Pandemic – an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number, of people. The classical definition includes nothing about population immunity, virology or disease severity, and seasonal epidemics are not considered pandemics (Kelly, 2011).

Pragmatic Learning – dealing with things sensibly and realistically in a way that is based on practical rather than theoretical considerations, that is, guided by practical experience and observation rather than theory (Vocabulary.com, 2021) implying the practicality of the learning circumstances during a pandemic.

Research Aim – is a research’s expression of intention or an aspiration of the research study, it summarises in a single, specific, and precise sentence what the researcher hopes to achieve at the end of a research project (Thomas & Hodges, 2010).

Research Objectives – these are specific statements indicating the key issues to be focused on in a research project outlining the specific steps taken to achieve the research aim (Thomas & Hodges, 2010). Objectives define the *what, why, who, when, where, and how* questions (Thomas & Hodges, 2010) – the 6 W’s of investigation.

Research Purpose – is a declarative succinct statement that summarises a research project's main goal providing some guidance in establishing, improved prediction; increased knowledge base; measurable change or improvement; a demonstration of social, organizational or institutional impact; understanding of complex phenomena; a test and evaluation of new ideas and theories; informed multiple stakeholders; development of new hypotheses and theories; and an understanding of past events (Newman & Covrig, 2013; Tashakkori & Teddlie, 2010).

2 Theoretical Background

It is through theory, a set of principles and propositions of practice, that determines what we can observe (Anderson, 2008) as it helps us to envision new worlds, prepare, and plan for the unknown (pandemics), and create artefacts like the one under construction, this study. Cognitive dissonance (cognitivist – the how) theory, in as much as humans have the inner ability to hold attitudes and behaviour in harmony, the onset of COVID-19 triggered disharmony and Contact Learning had to give way to e-Learning to eliminate dissonance and discordance (Anderson, 2008); Theory of planned behaviour (behaviourist – the what) drew on deportment and behaviour as acquired through the surroundings and environment, the new COVID-19 environment dictates new behavioural approaches into Virtual Learning – the new normal (Anderson, 2008); Constructivist learning theory influences the pedagogical delivery through Distance Learning in the COVID-19 times, thus knowledge making in virtual rooms (Anderson, 2008); Connectivism learning theory comes handy in this research as we capitalise on the digital age impacting on learning through technology, integrating the principles and propositions explored by complexity, twist, chaos, and network (Anderson, 2008) – in the COVID-19 times. Self-organisation theory is being applied in the research as we seek spontaneous order from the COVID-19 induced chaos. Interpretivist theory brings about the analysis and interpretation, combined with hermeneutics, of the empirical data collected (Anderson, 2008) in trying to understand the adequacy of Lund University response – sense-making. These theories are collectively relevant to this study as they provide the foundation of pedagogical delivery across the University. As Rosset (2002) propounds it that e-Learning has plenty promises if teaching, technical, administrative staff, and resources are committed in doing it right with well-designed e-Learning material – created to enable understanding and comprehension.

The Chapter prologue touched on various relevant theories to the subject of study, however, the writer develops one theory further, that is, the Connectivism learning theory primarily because of its immediate applicability to the postulated pedagogical theories during times we are in, which demand technology as the medium of teaching and learning. Connectivism is an alternative theory of learning developed by George Siemens that addresses inadequacies of current theoretical models such as behaviourism, cognitivism, and constructivism (Siemens, 2004; Yurkiw, 2017). This theory of learning recognizes that technology has impacted society and that thoughts on teaching and learning are shifting. It acknowledges that learning is no longer individualistic but relies on the informal or formal learning that occurs through participation in communities of practices, personal networks, and work-related tasks (Siemens, 2004; Yurkiw, 2017). Simply put, connectivism is about forming connections between people and with technology. To cope with information overload and complexity, teaching and learning in a connectivist learning environment occurs within learning ecologies, communities, and networks. These facilitate connections and information sharing while encouraging life-long learning in the individual as well as the group (Siemens, 2004; Yurkiw, 2017). The Chapter further reviews literature on how the dissertation contributes to the field of Information Systems, post COVID-19 trends, facts about COVID-19, open distance learning (ODL), and the research philosophy under consideration.

2.1 COVID-19 and Post-COVID-19 Trends in HEIs

Naturally there comes a post effect pattern and new ways are born. Though forced upon us, the reality of life has it that change is inevitable, in fact it is the way of life. According to Jena (2020), tomorrow is a new morning, a new dawn rises, marking a new beginning, new technologies challenging the traditional paradigms such as classroom lectures (Contact Learning), modes of learning and modes of assessment. The new trends will allow the education sector to imagine new ways of teaching and learning and some trends may be pointed as, personalised learning on the rise – as learning will not be confined to physical classes students can pursue learning in line with their taste, preferences, and choice; student attendance may slow down – parents and students may be reluctant to attend physical classes opting for home schooling and virtual platforms; national and international student mobility for higher study may be reduced –

migration to or from certain areas may be restricted as health safety concerns take centre stage; learning with social distancing may be the norm – avoidance of warm handshakes, hugs, and keeping social distance may subsist (Bender, 2020).

Educational institutions may run with different shifts per day – social distancing induced pressure may lead institutions to employ shift learning as less students will be required in class per session; a rise in the gap between privileged and under-privileged students – students from low income families may continue to suffer the consequences of the pandemic; technology becomes the norm in teaching and learning – technology driven ways of life may be the norm as people get accustomed to digital life; assessment systems may be reshaped – artificial intelligence enters the fora to assist with learning assessments, evaluation, preparing mark-sheets, and monitoring student performance; demand for open and distance learning and online learning may grow exponentially – to maintain social distancing these forms of teaching and learning may continue to dominate the educational system; blended learning may take the leading role (Lebohang, 2007) – tech-savviness arising from the pandemic may continue promoting a mix of Contact Learning and e-Learning; student debt crisis may rise – coupled with loss of jobs as businesses close down, pressure mounts on servicing debts turning into a crisis, economies took a deep in the pandemic; unemployment rates may rise – exerting pressure on government, social, and unemployment support systems and structures (Jena, 2020; Bender, 2020).

COVID-19 is an affliction contagion arising from a new genus of coronavirus. ‘CO’ means corona, ‘VI’ standing for virus, and ‘D’ represents disorder or disease (Bender, 2020). The corona virus is connected to the group of viruses that cause Severe Acute Respiratory Syndrome (SARS) and related to types of viruses that cause influenza and common colds. Infection symptoms and manifestations are highly contagious affecting respiratory passages causing fever, severe aching, cough, catarrh, inflammation, and shortness in the power of inhalation or exhalation (Bender, 2020). In acute cases, the contamination causes lung inflammation or breathing difficulties (Bender, 2020). COVID-19 can be confirmed by testing and not through physical looks and perceptions. There was no available vaccine for COVID-19 until recently.

2.2 Open and Distant Learning (ODL)

The phrases ‘open learning’ and ‘distance education’ portray approaches that focus on opening access to education and training provision, freeing learners from the constraints of time and place, and offering flexible learning opportunities to individuals and groups of learners (Pityana, 2009; Gaskell, 2017). Online education, e-Learning or taking any course or program via online learning, is all regarded as distance learning (DLCG, 2015). Online or e-Learning and distance education need equivalent e-learning tools, and the similitude ends there (Stauffer, 2020; Gaskell, 2017). ODL is a promising and practical strategy to address the challenge of widening access to education, thus increasing participation in higher education. It is increasingly seen as an educational delivery model which is cost-effective without sacrificing quality (Pityana, 2009). ODL has been accepted as a viable, cost effective means of expanding provision without costly outlay in infrastructure (Pityana, 2009). *Figure 1* gives a Nomological Network of concepts.

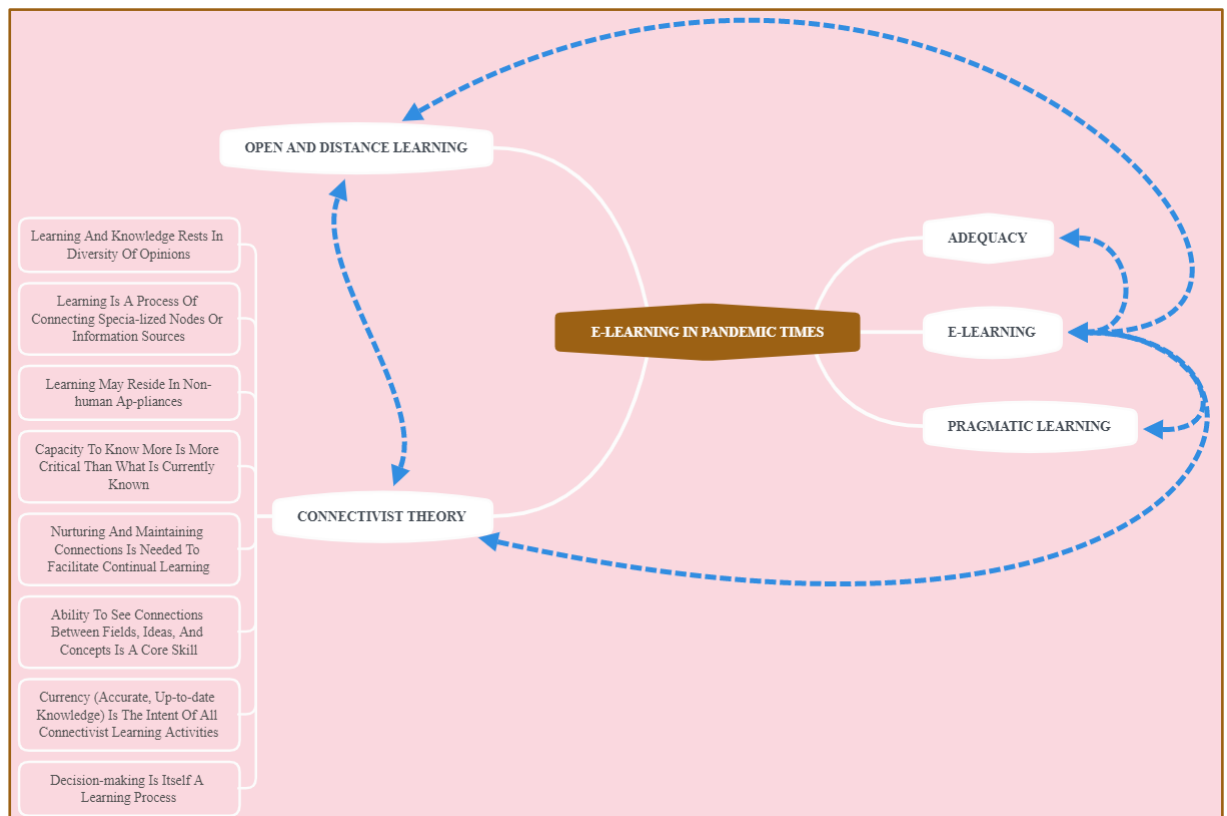


Figure 1: The Nomological Network – Related to Open and Distance Learning

Three key contrasts between e-Learning and distance learning are intention, interaction, and location (Stauffer, 2020; Gaskell, 2017). Location – online learning (a.k.a. e-Learning), a teacher with students in class working via digital assessments and lessons, while distance learning entails students to work online from home or anywhere while the lecturer assigns work, checking-in through digital means (Stauffer, 2020). Interaction – online learning students are in class and interaction is in-person with the teacher. Online learning applies to blended learning technique with teaching strategies such as Contact Learning (Stauffer, 2020). Distance learning excludes in-person interaction of students and teachers, relying heavily on digital means, via messaging and texting apps, video calling, discussion forums and boards, and Learning Management System (LMS) (Stauffer, 2020; Gaskell, 2017). Intention – online or e-Learning is a blended design to use with a variety of in-person pedagogical delivery approaches (Stauffer, 2020; Lebohang, 2021a). Distance learning delivers solely online, unblended (Stauffer, 2020) and can be offline too. Online learning, increases student engagement when used as part of a blended learning technique, delivering content in multiple or various ways (Arkorful & Abaidoo, 2015; Stauffer, 2020; Lebohang, 2021a). Distance learning continues without disruption during disasters or COVID-19 pandemic because the teaching is remote based (Stauffer, 2020; DLCCG, 2015).

With this prelude, which option is best for students? Summarily put, distance learning, e-Learning, and massive open online courses (MOOCs) are all good pedagogical strategies (Lebohang, 2021a) which are more effective as a blend in response to various circumstances and needs subject to provisioning of appropriate learning support materials – they all subscribe to the Connectivist theory (Siemens, 2004; Yurkiw, 2017). In the event of pandemics, the strategies can be used variably to enable continuity in education delivery, nonetheless they are all subject to effects of COVID-19. Stauffer (2020), views online learning as best for middle and high school (in as much as it is applicable to HEIs (Arkorful & Abaidoo, 2015)). Lund University has a selection of stand-alone courses and one full degree programme available through distance learning. Such programs are designed for the method of delivery, however, in COVID-19 circumstances it became a pronto reaction to the situation, hence the call for this study to gather

some understanding on the state-of-affairs. *Figure 2* below illustrates the structure of e-Learning, the taxonomy structure as set forth by Arkorful and Abaidoo (2015).

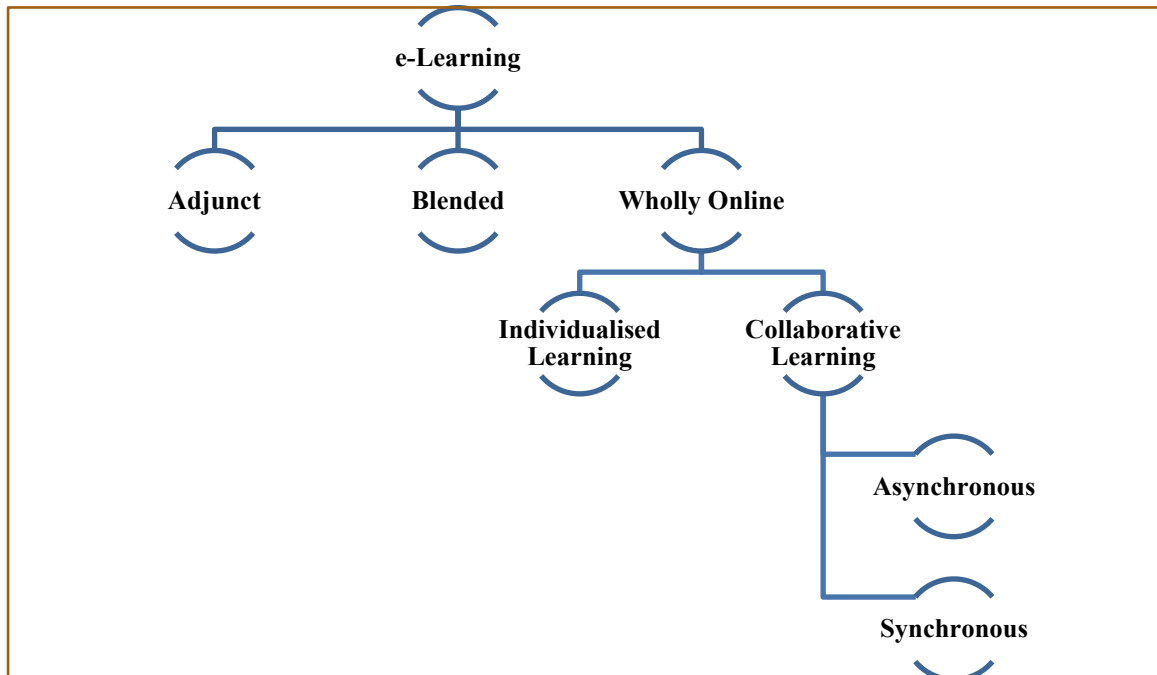


Figure 2: e-Learning Model in Education (Adapted from Arkorful & Abaidoo, 2015)

To sum up, Open Distance Learning: in a broad sense, open distance learning is a term often used synonymously with online learning, e-Learning, distance education, correspondence education, external studies, flexible learning, and massive open online courses (MOOCs) (UNESCO, 2020). Common features of any form of distance learning are, the teacher-learner separation by space or time, or both, and the use of media and technology to enable communication and exchange during the learning process despite this separation (UNESCO, 2020). This may be achieved through print-based learning materials, or one-way massive broadcasting (TV and radio programmes), or through web-based exchange using social media channels or learning platforms. Distance learning tends to require a high level of self-directed learning on the part of the learner, and study skills, which must be supported through new teaching, learning and guidance strategies (UNESCO, 2020) – the learner should be self-disciplined. *Table 1* below sums up the Concepts by Author related to Open and Distance Learning.

Table 1: Open and Distance Learning Concepts

CONCEPT	DESCRIPTION	REFERENCES
Adequacy	State of sufficiency for the purpose	Arkorful, V., & Abaidoo, N. (2015)
Connectivist Theory	A theory that takes learning as impacted through technology	Siemens, G. (2004); Yurkiw, S. (2017)
e-Learning	Learning that occurs through use of digital technology	Arkorful, V., & Abaidoo, N. (2015); DLGG. (2015); Lebohang, M. (2021a); Siemens, G. (2004); Stauffer, B. (2020)
Open & Distance Learning	Flexible learning free from time and place	DLGG. (2015); Gaskell, A. (2017); Pityana, N.B. (2009); Stauffer, B. (2020)
Pragmatic Learning	Learning guided by practicality than theory	Arkorful, V., & Abaidoo, N. (2015)

2.3 Evaluation of e-Learning

Effective e-Learning is achieved by assimilating present-day learners and designing the study material aids that captivates them and help improve performance and achievement building knowledge (Greany, 2019a; Greany, 2019b). Many students are left behind by an educational system that some people believe is in crisis. Improving educational outcomes requires efforts on many fronts, but a central premise is that one part of a solution involves helping students to better regulate their learning through effective learning techniques (Dunlosky, Rawson, Marsh, Nathan, et al., 2013). Cognitive and educational psychologists have developed and evaluated easy-to-use learning techniques that could help students achieve their learning goals. Ten learning techniques have been reviewed, thus elaborative interrogation; self-explanation; summarization; highlighting and underlining; the keyword mnemonic; imagery use for text learning; rereading; practice testing; distributed practice; and interleaved practice (Dunlosky, Rawson, Marsh, Nathan, et al., 2013). The techniques presented relative utility to students and the benefits were evaluated across four categories of variables, learning conditions, student characteristics, materials, and criterion tasks. Learning conditions included aspects of the learning environment in which the technique is implemented, such as whether a student studies alone, with a group, or via e-Learning (Dunlosky, Rawson, Marsh, Nathan, et al., 2013).

Student characteristics include variables such as age, ability, level of prior knowledge, and any other applicable demographic details. Materials vary from simple concepts to mathematical problems to complicated science texts. Criterion tasks include different outcome measures that are relevant to student achievement, such as those tapping memory, problem solving, and comprehension (Dunlosky, Rawson, Marsh, Nathan, et al., 2013). All these aspects directly impact the success of e-Learning in ensuring an effective and pragmatic building of knowledge process. e-Learning professional procedures (a.k.a. best practices) to be incorporated in effectual and productive e-Learning include, clearly stating the learning objective; repetition enhances retention rate; drip-feeding learning content is right; test learners' knowledge with learning assessment; consider user experience and user interface; great content make-up an effective e-Learning course material (Neelakandan, 2019). These concepts are vital in evaluation and assessing the effectiveness of the e-Learning process and material (Greany, 2019b; Steen, 2008). *Figure 3* gives a Nomological Network of the Concepts in this Section.

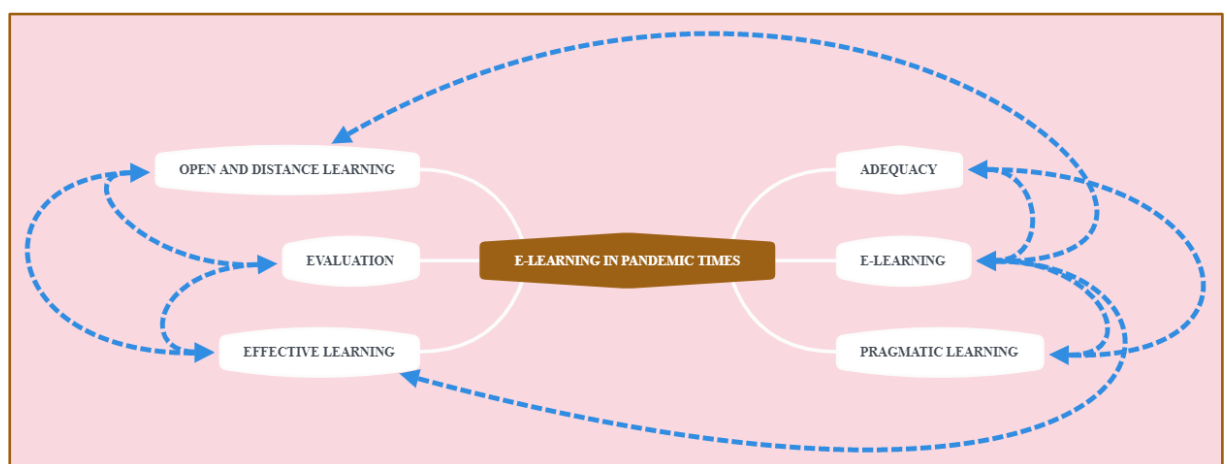


Figure 3: The Nomological Network – Related to Evaluation of e-Learning

For enhanced evaluation use of data and e-Learning analytics is critical. Cultivating digital learning is about using data and analytics to read the audience, uncover problems and spot opportunities. This will allow for both proactive and reactive response on the teaching staff. Course analysis statistics, activity per week, pass and completion rate, preferred devices (PC, mobile, tablet), time spent, total users, user location, global trends, authoring, preferred formats,

and optimum video length (Curl, 2018; Steen, 2008) are key metrics that help with e-Learning evaluation. Modern e-Learning examples to inspire students include scenario-based learning (video and audio e-Learning); personalised learning (diagnostics, discovery, and digital toolkit exploratory learning); microlearning (performance support resources and blended learning campaigns); and storytelling for learning (digital storytelling) (Greany, 2019a). Engaging e-Learning captures the audience's specific needs and performance context. So, it is vital to always understand student needs as part of the e-Learning development process (Greany, 2019a; Steen, 2008). This will drive the particular 'ingredients' e-Learning design should include, such measures of effective e-Learning are relevancy and engaging (Greany, 2019a).

For a successful e-Learning experience the 5C Framework gives a good evaluation guide to designing e-Learning, capture – start with a clear plan, conceptualise – lead with a prototype, create – build with confidence, cultivate – improve and refine, commercialise – deliver on return of investment (ROI) (Greany, 2017). Emerging e-Learning trends that enrich learning material are, focusing on leadership; developing 'growth' coaches, not performance managers; more user generated content; smarter curation; gather daily data – a.k.a. big data; be brave, culling what does not work; effective mobile learning – not just mobile content; use of videos and more videos; more self-directed learning; and integration and flow – learning should be 'flowing' seamlessly assisting learners all the time through use of computer technology in student learning experience (Greany, 2018; Steen, 2008). Instructional theorist Robert M. Gagne developed nine events of instruction that when put together, pragmatic process for effective learning (Nedeva, & Dineva, 2016; Gagne, Briggs, & Wager, 1992). Most instructional design is based on these events and the process is widely used in teaching practices evaluation (Nedeva, & Dineva, 2016). These principles of instruction apply in any design of e-Learning (Nedeva, & Dineva, 2016). *Figure 4* below depicts the nine events of instruction.

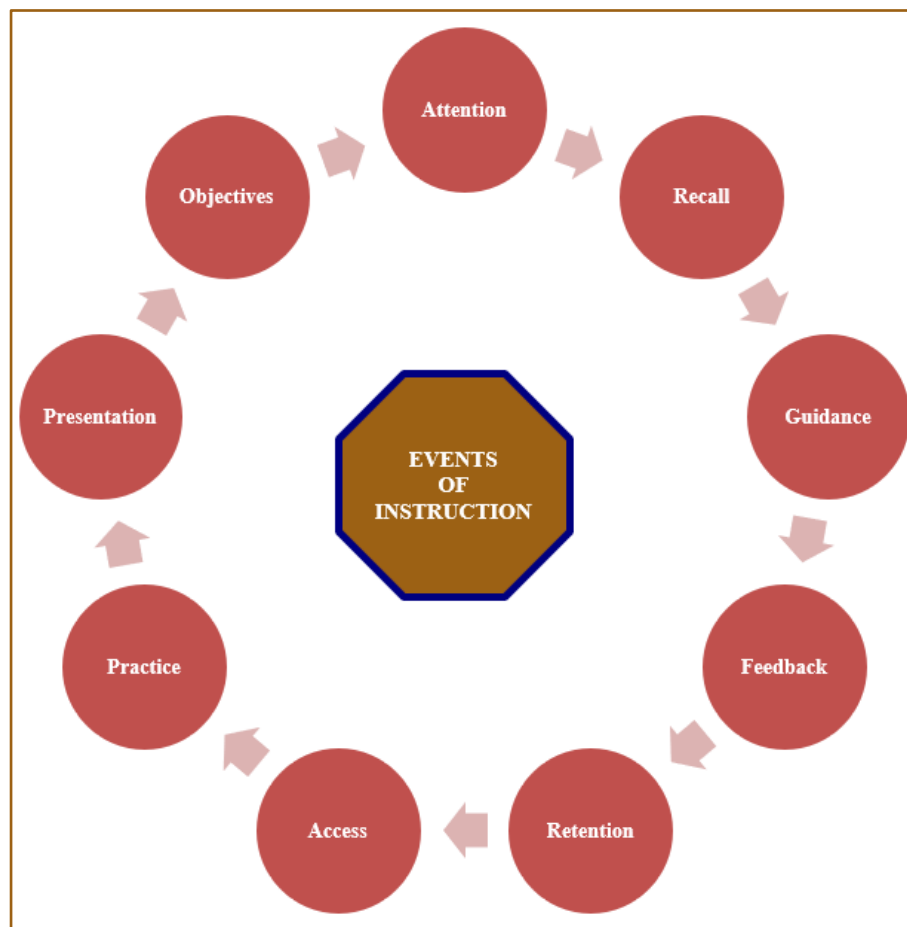


Figure 4: Gagne's Nine Events of Instruction (Adapted from Nedeva & Dineva, 2016)

Table 2 below sums up the Concepts by Author as related to Evaluation of e-Learning.

Table 2: Evaluation of e-Learning Concepts

CONCEPT	DESCRIPTION	REFERENCES
Adequacy	State of sufficiency for the purpose	Arkorful, V., & Abaidoo, N. (2015); Ching, H.S., Poon, P.W.T., & McNaught, C. (2006); Gagne, R.M., Briggs, L.J., & Wager, W.W. (1992); Greany, K. (2019a); Greany, K. (2019b); Nedeva, V., & Dineva, S. (2016); Steen, H.L. (2008)
Effective Learning	A state of producing desired learning outcomes	Ching, H.S., Poon, P.W.T., & McNaught, C. (2006); Curl, C. (2018); Dunlosky, J., Rawson, K.A., et al. (2013); Gagne, R.M., Briggs, L.J., & Wager, W.W. (1992); Greany, K. (2017); Greany, K. (2018); Greany, K. (2019a); Greany, K. (2019b); Hativa, N. (2000); Nedeva, V., & Dineva, S. (2016); Steen, H.L. (2008)
e-Learning	Learning that occurs through use of digital technology	Anderson, T. (2008); Arkorful, V., & Abaidoo, N. (2015); Ching, H.S., Poon, P.W.T., & McNaught, C. (2006); Curl, C. (2018); DLCG. (2015); Gagne, R.M., Briggs, L.J., & Wager, W.W. (1992); Greany, K. (2017); Greany, K. (2018); Greany, K. (2019a); Greany, K. (2019b); Lebohang, M. (2021a); Nedeva, V., & Dineva, S. (2016); Rosset, A. (2002); Steen, H.L. (2008); Stauffer, B. (2020); UNESCO. (2020)
Evaluation	Determination to improve performance	Ching, H.S., Poon, P.W.T., & McNaught, C. (2006); Curl, C. (2018); Dunlosky, J., Rawson, K.A., et al. (2013); Gagne, R.M., Briggs, L.J., & Wager, W.W. (1992); Greany, K. (2017); Greany, K. (2018); Greany, K. (2019a); Greany, K. (2019b); Hativa, N. (2000); Nedeva, V., & Dineva, S. (2016); Steen, H.L. (2008)
Open & Distance Learning	Flexible learning free from time and place	Ching, H.S., Poon, P.W.T., & McNaught, C. (2006); DLCG. (2015); Gagne, R.M., Briggs, L.J., & Wager, W.W. (1992); Gaskell, A. (2017); Nedeva, V., & Dineva, S. (2016); Pityana, N.B. (2009); Stauffer, B. (2020); UNESCO. (2020)
Pragmatic Learning	Learning guided by practicality than theory	Arkorful, V., & Abaidoo, N. (2015); Ching, H.S., Poon, P.W.T., & McNaught, C. (2006); Curl, C. (2018); Dunlosky, J., Rawson, K.A., et al. (2013); Gagne, R.M., Briggs, L.J., & Wager, W.W. (1992); Greany, K. (2017); Greany, K. (2018); Greany, K. (2019a); Greany, K. (2019b); Hativa, N. (2000); Nedeva, V., & Dineva, S. (2016); Steen, H.L. (2008)

2.4 Contribution to Information Systems (IS)

Today's higher education is, no doubt, in transition, and at a critical crossroads (Ching, Poon, & McNaught, 2006) – to survive and thrive universities must restructure and reform (Lebohang, 2021a). We are in a pandemic situation where traditional Contact Learning need to be moved to online (applying the Connectivist learning theory), irrespective of the challenges it brings along, the transition and e-Learning material should be designed for optimal student learning outcomes. The study aligns with the dimensions of research relevance in Information Systems, that is,

importance, accessibility, and applicability (Rosemann & Vessey, 2008). Importance – the study sought to address a real-world problem in a timely manner, its current, thus the e-Learning induced by the COVID-19 pandemic outbreak. Accessibility – the study will be readable and focuses on empirical results from which recommendations will be drawn providing a reference point for alike situations and further Information Systems research.

Applicability – the paper or study, through initially the proposal (suitability test), and now the conducting and execution of the dissertation it is indicative of an Information Systems research upon which applicability is derived (Lebohang, 2020) with concrete outcomes that further guidance to alike scenarios in the future (Bender, 2020). Through the study of Information Systems, to which this research is part of, knowledge is accumulated which will assist businesses and organisations to make the best use of computer technology in driving their operations. Whence this study becomes a vital contributor to the field of Information Systems as it is analysing a current real-world problem in a crisis setting impacting the whole world. Education is, unavoidably, under the influence of the global e-Revolution change (Ching, Poon, & McNaught, 2006) – a need to prepare graduates for a rapidly changing and connected world. *Table 3* below gives references for the questionnaire research instrument construction guides that the writer used in developing it.

Table 3: Questionnaire References

CATEGORY	STATEMENT	REFERENCES
Background Information	Department	SurveyMonkey. (2021b); Apostolopoulos, A. (2020)
	Position	
	Employee Type	
	Gender	
	Age Range in Years	
	How many months have you been using e-Learning	
Category I: Resources' Adequacy and Timeliness	Adequate e-Learning tools were available e.g. Collaboration tools such as Microsoft Teams, Zoom	Benson, L., Elliott, D., Grant, M., Holschuh, D., Kim, B., Kim, H., Lauber, E., Loh, S., & Reeves, T.C. (2002); Anderson, K. (2021); Belin, A. (2019); Khan, I.A. (2018); Legault, N. (2014); Sriram, S. (2017)
	Tools were immediately (within ONE month) available after COVID-19 outbreak	
	Adequate training webinars on use of tools such as Canvas, Zoom were available to help meet e-Learning goals	
	Training webinars on use of tools such as Canvas, Zoom were immediately (within ONE month) available after COVID-19 outbreak	
	Adequate help and support were available in developing/designing e-Learning material from Lund University help desk e.g. videos, presentations	
	Help and support were immediately (within ONE month) available after COVID-19 outbreak	
The overall e-Learning help and support were adequate to cover e.g. Lectures, Workshops, Student Evaluations/Assessments/Assignments		

	Overall e-Learning help and support were immediately (within ONE month) available after COVID-19 outbreak	
Category II: e-Learning vs Contact Learning	Contact Learning contributes significantly to boosting students' academic achievement over e-Learning	Horton, W. (2001); Andriotis, N. (2016); Community Team. (2014); LaMotte, A. (2016); Moldovan, I. (2020); Sviridenko, A. (2018); SurveyMonkey. (2021a)
	Continuous exposure to electronic screens in e-Learning is tiring and exhausting	
	The volume of assignments via e-Learning led to confusion, frustration, and poor Student performance	
	Continuing with the e-Learning model is not recommended because it is socially and psychologically unhealthy	
	Contact Learning contributes to strengthening the social personality of students over e-Learning	
Category III: e-Learning Evaluation and Assessment	Prolonged use of e-Learning tools often leads to boredom, nervousness, and tension in both Lecturers and Students	Morgan, G. (2001); Apostolopoulos, A. (2020); Enders, M. (2021); Laskaris, J. (2016); Pappas, C. (2018); SurveyMonkey. (2021a); Warwick University. (2011)
	Quality of teaching in e-Learning was satisfactory	
	Giving quizzes and exams online was not comfortable and made me nervous as e-Learning is not secure or fool-proof	
	Lecturer-Student interaction isolation has increased impacting e-Learning negatively	
	Measures of lockdown, closures, and quarantine, brought by COVID-19 caused stress, frustration, and depression impacting e-Learning negatively	

3 Research Methodology

Research methodology chapter demonstrates a plan to answer the research question. The research method is the strategy employed by the writer to implement the plan. Research design and methods are different but closely related, because a good and balanced research design ensures that the data collected helps answer the research question more effectively. This perspective was kept in tandem throughout the Chapter. For this study, Internet was unsuitable and could not be used as a source of empirical evidence – data had to be systematically gathered from respondents through an appropriate research questionnaire technique.

3.1 Research Approach and Method

The study, took a quantitative research approach using the quantitative survey method which involved collecting and analysing data numerically to understand concepts, opinions, or experiences gathering in-depth insights into a problem or generate new ideas for research, thus emphasising on quantification rather than words in the collection and analysis of data (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016). The concept the writer sought to understand is well illustrated in Chapter 1 of the study. Based on the research strategy undertaken, the principal orientation to the role of theory in relation to the research borrows from inductive reasoning approach that leads to possibilities of theory generation (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016). Inductive reasoning which breeds inductive research implies a method of reasoning in which the premises and subjects are viewed as supplying some evidence, but not full assurance, of the truth of the conclusion (as it is based on opinions of people in a social setting) (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016). The study sought to search for patterns from observations by Academic Staff on how COVID-19 impacted their pedagogical delivery of teaching and learning, the writer developed explanations of the phenomenon (based on opinions from research subjects and respondents) (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016).

The epistemological orientation of the study derives from the Interpretivism school of thought that posits the philosophical position of idealism grouping together diverse approaches that includes social constructivism, phenomenology, and hermeneutics, thus the approaches that reject the objectivist and positivist view that meaning resides within the world independent of consciousness (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016). As the study sought to understand the impact of COVID-19 to teaching and learning at Lund University, the writer was presented with this philosophical position in addressing the problem at hand embodying a view of social reality as a constantly shifting emergent property of individuals' creation as premised with the circumstances they are in (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016) – a pandemic driven phenomena, triggered by an emergency outbreak.

The ontological orientation of the study took a Constructionism incline as it is the theory that says learners construct knowledge rather than just passively take in information, as people experience the world and reflect upon those experiences, they build their own representations and incorporate new information into their pre-existing knowledge schemas (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016; CRRC, 2019) a scenario that the society underwent during the COVID-19 pandemic. Constructivism as a theory in education, it recognizes that learners construct new understandings and knowledge, integrating with what they already know, this includes knowledge gained prior to entering school or a phenomenon (COVID-19 pandemic) (Bhattacharjee, 2012; Bryman, 2012; Bryman, 2016; CRRC, 2019). The study subscribed to this view as it sought to understand the teaching and learning aspects as was affected and impacted by the circumstances at the time, sudden of occurrence of a disease.

From the philosophical understanding stated above, the study aligns with the constructivism theory which suggests that learning is an active process where learners create, synthesize, and apply new concepts based on their current and past knowledge (Bhattacharjee, 2012; Bryman,

2012; Bryman, 2016; CRRC, 2019). However, the study delves further, in response to the COVID-19 phenomenon and took a Connectivism learning theory which acknowledges the impact of technology, society, personal networks, and work-related activities as this became the norm, the new normal scenario in society (CRRC, 2019) – leading to the research topic and its associated sub views under consideration. Technology took a central role in meeting the demands of teaching and learning, educational institutions had to adapt to e-Learning forms over Contact Learning approach. The move enabled continuity in pedagogical delivery at Lund University. Therefore, Connectivism is the primary philosophical school of thought that underpinned the study to draw inferences of learning through technology use.

For the study, these four approaches applied fairly – first, data was collected based on opinions of Academic Staff; second, coronavirus is a key input, processed through the responses that were made by Lund University, and output as outcomes of the study; third, as adapted and adopted into e-Learning from Contact Learning; and fourth, COVID-19 took centre stage here as the critical mass leading to it spreading uncontrollably, and fatally so. Therefore, the study persisted under the philosophical guidance of applicable theories.

3.2 Empirical Context

The fundamental resources to get started in gathering data were the Teaching and Academic Staff of Lund University. An appropriate and suitably structured questionnaire was used to gather response data for further interpretation and analysis. All those involved with education and academics are key Stakeholders to whom this research will apply and be of interest, examples include, but not limited to, students, teaching and academic staff, education and academic administration staff, education policy development, study material development teams, analysts, citizens (examples include parents, townsmen, townswomen, oppidans, and prospective students) and researchers (of-course Information Systems researchers included).

Lund University is the primary organisation for this research and key contact persons for the study were the university academic staff, a prelude to this interaction is a letter of permission and consent (to conduct the research as a prerequisite for the partial fulfilment of the requirements for Master studies in Information Systems) from the Lund University School of Economics Management's (LUSEM) Department of Informatics. An exchange with fellow students (including some outside the Lund University community) assisted with proof reading, views, and advice, not forgoing the research Supervising Team which undoubtedly played an insurmountable role for this research to see the light of the day – their professional craftsmanship and virtuosity in directing the study shall forever remain invaluable and all-important.

A research population is generally a large collection of individuals or objects that is the focus of a scientific query – like the one being undertaken. A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics. All individuals or objects within a certain population usually have a common, binding characteristic or trait (Explorable, 2009; Banerjee, & Chaudhury, 2010). It is for the benefit of the population that researches are done. However, due to the large sizes of populations, the researcher could not test every individual in the population because it is too expensive and time-consuming. This is the reason why the writer relied on sampling techniques. The present study had one type of population. All the Academic Staff at Lund University as they are the ones mostly impacted in their pedagogical delivery. How are they coping, were they well prepared, adaptation process to the new ways, how they foresee the future, will they apply flipped classroom approach remotely, are all interesting aspects that can be drawn from the population.

A sample is a proportional sum of the total target population. A true sample is representative of the population from which it is drawn. Population sample is a subject matter subset characteristic of the whole population (Explorable, 2009; Banerjee, & Chaudhury, 2010). To permit meaningful

statistical analysis the sample representation must be of adequate size. The study had one sample – Academic Staff. Representative sampling was used in selecting respondents from the sampling frame. This gave each member of the population a chance of being selected, Merriam and Simpson (1984). According to Leedy (1980) the representative group should not be chosen haphazardly, but instead should be chosen systematically in a random way. This allows for generalisations in the conclusions that would be drawn from the sample data. Stratified sampling was also applied to choose the respondents. This ensured a fair sample spread between Bachelor and Master courses to be included in the survey.

Other considerations were to applying convenience and judgemental sampling. With convenience sampling, the samples are selected because they are accessible to the researcher (Explorable, 2009; Banerjee, & Chaudhury, 2010) – in this case Lund University was the pick. Subjects are chosen simply because they are easy to recruit (as they existed in the same environment as the researcher). Apart from its convenience this technique was considered easiest, cheapest, and least time consuming – given the researcher is an international student stuck in COVID-19 controls. Judgmental sampling as purposive sampling (Explorable, 2009; Banerjee, & Chaudhury, 2010), subjects were chosen with a specific purpose in mind – Academic Staff involved in pedagogics. With judgmental sampling, the researcher believed that some subjects are more fit for the research compared to other individuals – exactly why they were purposively chosen as subjects.

3.3 Data Collection

Anonymous data relevant to the study was gathered and collected electronically through online electronic forms (Lebohang, 2021b) employing the questionnaire data collection technique, respondents made their choices, input, and comments and submitted electronically. The submission was automatically transcribed into a spreadsheet format, Microsoft Excel for this study, from which the writer processed, aggregated, and analysed the response data further to draw insights from it – trends, behaviour, and the bigger picture view. Business Intelligence tools, Qlik Sense and Power BI were used to query, report, and limn (map out) insights and visualisations from the collected data.

The questionnaire data collection technique was employed due to its appropriateness during the pandemic times we were in and its applicability to this type of research paradigm, allowing for the interpretation of e-Learning reality through sense-making process of quantitative data collected. The respondents and informants were a random or selected subset of Lund University Teaching and Academic Staff primarily because they were active in pedagogical practice that has been transitioned from Contact Learning to e-Learning. They formed an appropriate and qualified set of respondents to the research under study. The researcher's personal biases were avoided, and interpreted data as received. The questionnaire questions were scrutinised for adequacy and relevancy, ensuring clarity, unambiguous, non-negative questioning, non-double barrelled, and non-presumptuous (Recker, 2013). Through a beta test exercise, the initial questionnaire was sent to a few (thirteen) respondents in the Department of Information Systems who helped structure and re-shape the questionnaire to be more appropriate and effective to the study requirements. The final questionnaire (Appendix A) was distributed to six-hundred respondents, covering sixty departments in the University (spread across all faculties and schools), two-hundred and forty-five people responded. All responses were of valid data. Confidentiality, and privacy were assured – research ethics in practice. All responses were anonymous.

3.4 Data Analysis Strategy

Data analysis strategy sets the tone to organise collected data into a coherent new structure that has context and explains the phenomenon under study. This study as a quantitative research, is more concerned about uncovering knowledge about how people think and feel about the circumstances in which they find themselves (e-Learning in Corona times) than they are, in

making judgements about whether those thoughts and feelings are valid (Thorne, 2000; Morse, 1994). A general appreciation of the theoretical assumptions underlying some of the more common approaches can be helpful, in understanding what a researcher is trying to say about how data were sorted, organised, conceptualised, refined, and interpreted (Thorne, 2000; ed. Morse, 1994). Insights can be obtained from data after collecting it. The transition from raw data, as conducted by researchers, to insights with structure, meaning, and context (information) is called data analysis (Bhatia, 2018).

Data analysis started by preparing data converting it from raw unprocessed data to numerically relevant, purposeful, and readable data (Bhatia, 2018; Bhattacharjee, 2012). Conducting data validation sought to avoid biasness in collected data. A four-step procedure (Bhatia, 2018) was followed, that is, fraud spotting and detection determining users responded only once and belongs to the required sample; screening guaranteed only academic staff participated; established a quantitative survey questionnaire data gathering process; and completeness confirmed that the questionnaire covered the required research aspects of the study as guided by the research question, aim, objectives, and purpose. Data editing was avoided as data was collected electronically in the right format avoiding errors which are usually inherent with manual data collection process, data fields were enforced through validation in the form. The electronic data collection kept away transcription errors, blank fields, outliers, and any data points that could hamper the accuracy of the results. Data coding an important step in data preparation was done by grouping data into categories and assigning values to responses from the survey questionnaire.

Descriptive statistics as a quantitative data analysis method was used to infer the collected data drawing out the insights hidden within it. Typically, descriptive statistics analysis helped the researcher to summarise the data and find patterns within it. The researcher applied the following descriptive and explanatory statistics, mean, median, mode, percentage, frequency, and range. Explanatory numerical data analysis (statistics) gives complete and perfect numbers (Bhatia, 2018). For this study descriptive statistics analysis was appropriate to show academic staff perspectives. Descriptive numerical data analysis is most useful to a study limited to a selected case study, Lund University for this research. Descriptive statistics is called univariate analysis because it analyses single elements and variables (Bhatia, 2018; Bhattacharjee, 2012).

Why does descriptive statistics matter for this research? While descriptive analysis is fairly basic statistics to calculate, they are incredibly important (Jansen & Warren, 2020) for this study for a few reasons: they helped the researcher get both a macro and micro-level view of collected data, thus they helped the researcher understand both the big picture and the finer details of the data; they helped the writer determine probable data errors; they help out tell the appropriate inferential statistical approach and technique to apply, as the techniques and methods rely on the bias or skewness (symmetry and normality) of the figures and data – for this study the writer does not apply inferential statistics. Fundamentally, descriptive data analysis is of great importance, irrespective of it being considerably simple and basic (Jansen & Warren, 2020). To show the value of descriptive analysis, the writer gave descriptive statistics the love and attention they deserve. Thus, a distinction between explaining how something operates (explanation) and why it operates in the manner that it does (interpretation) may be a more effective way to distinguish quantitative from qualitative analytic processes involved in any study (ed. Bryant, & Charmaz, 2007; ed. Morse, 1994) drawing interesting accurate and deep understanding.

3.5 Validity and Reliability

The research study stands the scientific quality test, that is, for it to be credible, it satisfied the three distinct inquiry elements given as rigorous methods (doing fieldwork in a manner that yield high quality data that are symmetrically analysed with attention to issues of credibility), credibility of the researcher (thus dependent on training, experience, track record, status, and presentation of self), and philosophical belief in the value of quantitative inquiry (this is a

fundamental appreciation of the naturalistic inquiry, quantitative methods, inductive analysis, purposeful sampling, and holistic thinking) (Patton, 2002; Recker, 2013). Validity is the extent to which an instrument measures that which it is supposed to evaluate (Seaman, & Verhonick, 1982). This is propounded by Leedy (1980) who defined validity of a questionnaire as how sound or effective the questionnaire is in measuring what it seeks to measure. Best and Khan (1993), Patton (2002), and Recker (2013), identified four types of validity as, face validity, criterion validity, content validity, and construct validity. Face validity finds out whether instruments are measuring what is supposed to be measured and whether the sample chosen is representative (Patton, 2002; Recker, 2013). Content validity is the accuracy with which an instrument measures the factors under study. Construct validity is interested in finding out whether a concept is accurately measured, thus requires empirical research of validation (Patton, 2002; Recker, 2013). Validity, often called construct validity, refers to the extent to which a measure adequately represents the underlying construct that it is supposed to measure (Bhattacharjee, 2012). These constraints were considered throughout the study. In the current study emphasis was focused on content validity of the research instruments as it makes or breaks the research outcomes (Patton, 2002; Recker, 2013). The questionnaire was validated by use of questions based on the problem under study as was put forward in the first Chapter of the dissertation, the exordium.

Validity and reliability are the yardstick against which the adequacy and accuracy of the study measurement procedures are evaluated in scientific research (Bhattacharjee, 2012). Reliability is the degree to which a test consistently measures what it assesses (Gay, 1979). Bhattacharjee (2012) added to this by saying reliability is the degree to which the measure of a construct is consistent or dependable. This refers to the extent to which a measuring instrument is constant every time it is administered. The instrument used was expected to yield the same results time after time, when administered on the same population, with other factors remaining unchanged. In the current study the questions directed to all Academic Staff were similar for all respondents. This meant reliability existed in the research instrument. *Figure 5* below illustrates the Research Triad showing population-sample-results relationship.

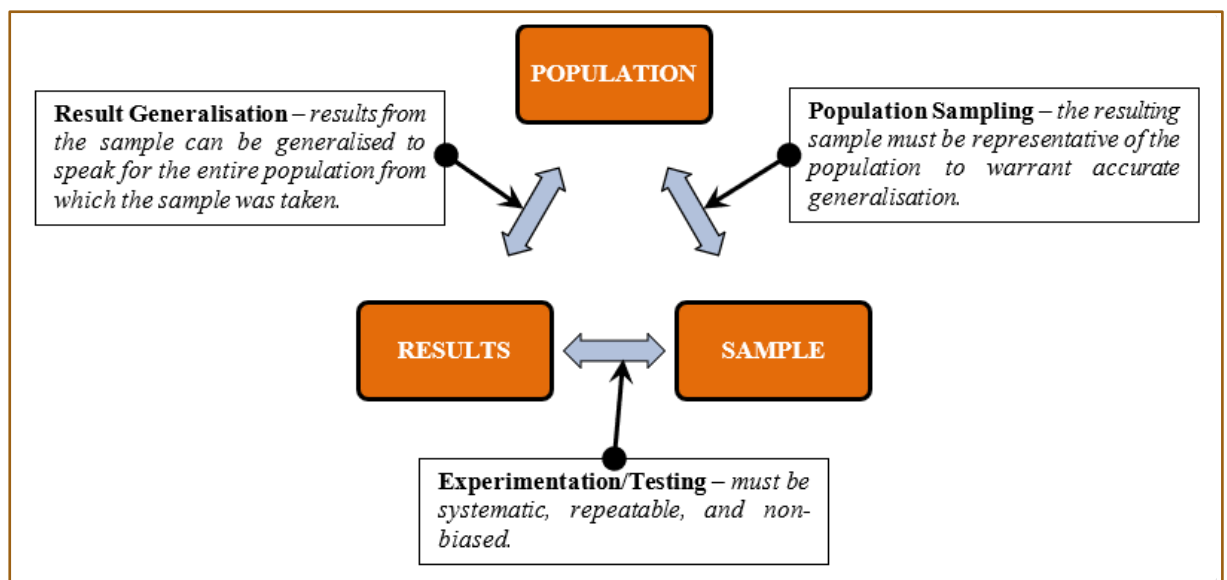


Figure 5: Research Triad (Adapted from Explorable, 2009)

To strengthen the validity, reliability of research instruments the researcher applied various sampling techniques to ensure a high degree of confidence to the data that flows through the research instruments – avoiding garbage in garbage out (GIGO) circumstances. Non-probability sampling was variably used because it is appropriate to demonstrate that a particular trait exists in the population (Explorable, 2009; Banerjee, & Chaudhury, 2010); it is suitable for a

quantitative, pilot or exploratory study – something this study fits into; it is applicable where randomization is tricky to impossible like when the population is almost limitless – COVID-19 affected everyone across the globe and HEIs are all over, a limitless parameter to the researcher; it is also useful when the researcher has limited budget, time and workforce – the researcher being a student in pandemic times was definitely constrained; and this technique can be combined and mixed with a randomized, probability sampling approach (Explorable, 2009; Banerjee, & Chaudhury, 2010) – stratified was applied to level out between Bachelor and Master degrees.

3.6 Research Ethics

In conducting this research study, ethical considerations remained a hallmark of the entire study process. Ethical aspects in this study took a two-pronged approach covering, firstly, the essence of the research to the participants and, secondly, the researcher's demeanour and deportment. These two fundamental aspects are easily noticeable in Appendices A, B, and C of this paper. The first aspect sought to maintain the integrity of the research subjects upholding their privacy, confidentiality, anonymity, and voluntarily taking part in the study (Bhattacharjee, 2012; Patton, 2002; Recker, 2013). The second aspect entails the writer's professional integrity and conduct covering reliability, honesty, respect, and accountability (Bhattacharjee, 2012; Patton, 2002; Recker, 2013). These ethical facets supported the research aims, objectives, and purpose, broadening knowledge (Bhattacharjee, 2012; Patton, 2002; Recker, 2013). The ethos reciprocates respect and impartiality promoting collaborative behaviour between the researcher and research subjects (Bhattacharjee, 2012; Patton, 2002; Recker, 2013). This collective of research ethics upheld the social, civil, good, and moral values of the study and guided the researcher to remain objective and sensitive to research subjects throughout the study process.

4 Results and Findings

The study received 245 responses out of a population of 600 respondents (245/600) thus 40.8% response rate. An average of 00:04:26 (hh:mm:ss) response time to complete the questionnaire was achieved, thus below the estimated five minutes completion time. The following sections give a detailed analytical interpretation of the *Background Information* collected covering respondents' demographic aspects; *Category I: Availability of e-Learning Resources* caps the adequacy and timely provisioning of e-Learning resources by the institution; *Category II: e-Learning Versus Contact Learning* wraps the comparative opinions of the respondents on these learning approaches; *Category III: e-Learning Evaluation and Assessment* shells out the respondents' appraisal and judgement of e-Learning; and *Overview of e-Learning Perceptions* consolidates and carefully synthesise the findings and discoveries of this study.

4.1 Background Information – Demographic Data

Department Affiliation

All the sixty departments responded, the number of respondents per department are as listed below, in *Table 4*. Department of Business Administration in the Lund University School of Economics Management (LUSEM) topped respondents list with eleven followed by Department of Clinical Sciences with ten. The following statistical measures were derived: the modal department in responses was Business Administration, overall mean responses per department is 4.08 responses, the median department in responses is Electrical and Information Technology, all 60 departments responded with a minimum of 2 responses per department, and a maximum of 11 responses per department.

Table 4: Distribution of Respondents per Department

DEPARTMENT	COUNT	DEPARTMENT	COUNT	DEPARTMENT	COUNT
Academy of Music	2	Chemistry	6	Informatics	6
Archaeology and Ancient Hist...	2	Clinical Sciences	10	Laboratory Medicine	4
Architecture and Built Environ...	4	Communication and Media	2	Department of Law	3
Art Academy	2	Computer Science	3	LUCSUS, Lund University Centr...	4
Arts and Cultural Sciences	3	Construction Sciences	3	Mechanical Engineering	4
Astronomy and Theoretical Ph...	5	Design Sciences	5	Medical Radiation Physics	4
Automatic Control	4	Economic History	2	Philosophy	2
Biology	8	Economics	2	Physical Geography and Ecosy...	4
Biomedical Centre, BMC	5	Department of Educational Sc...	2	Physics	3
Biomedical Engineering	3	Electrical and Information Tec...	7	Political Science	4
Building and Environmental T...	8	Energy Sciences	4	Psychology	5
Business Administration	11	Experimental Medical Science	5	School of Aviation	3
Business Law	2	Food Technology, Engineering...	2	School of Social Work	4
Centre for Advanced Middle E...	4	Gender Studies	3	Service Management and Serv...	6
Centre for Environmental and ...	3	Geology	4	Sociology	4
Centre for European Studies	5	Health Sciences	5	Statistics	4
Centre for Languages and Lite...	5	History	4	Strategic Communication	4
Centre for Mathematical Scien...	2	Human Geography	4	Technology and Society	5
Centre for Theology and Relig...	2	Immunotechnology	2	Theatre Academy	4
Chemical Engineering	3	Industrial Management and L...	4	Translational Medicine	4

Respondent Role

Most respondents are Lecturers, 67% of the people answered ‘Lecturer’ as their role in the institution, see *Figures 6, 7, and 8* below. The following statistical measures were derived: the modal job title was ‘Lecturer’, overall mean responses per job title is 30.63 responses, the median job title is ‘Lecturer’, all 8 job titles responded with a minimum of 2 responses per job title, and a maximum of 164 responses.

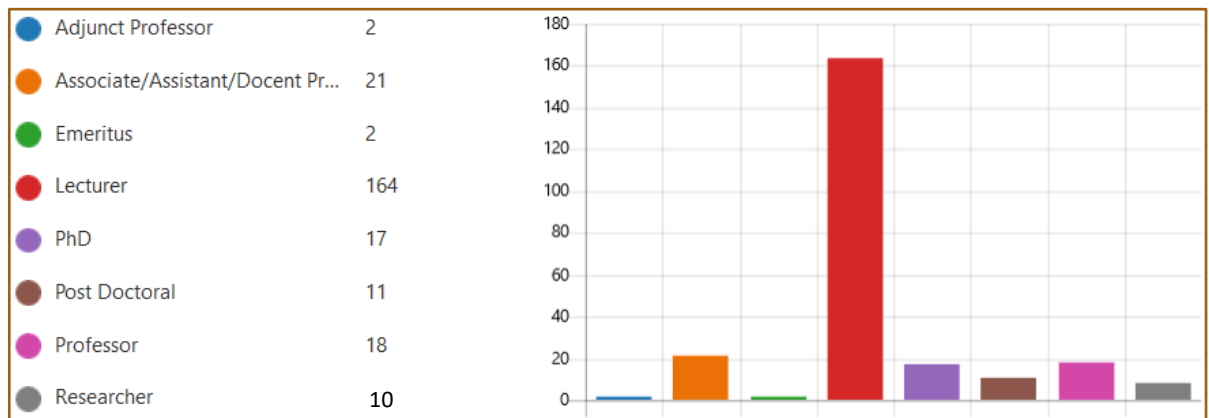


Figure 6: Academic Position Frequency

The data shows that most Lecturers (98%) were more than ten (10+) months experienced in e-Learning pedagogics delivery, very crucial in pandemic times, see *Figure 7* below.

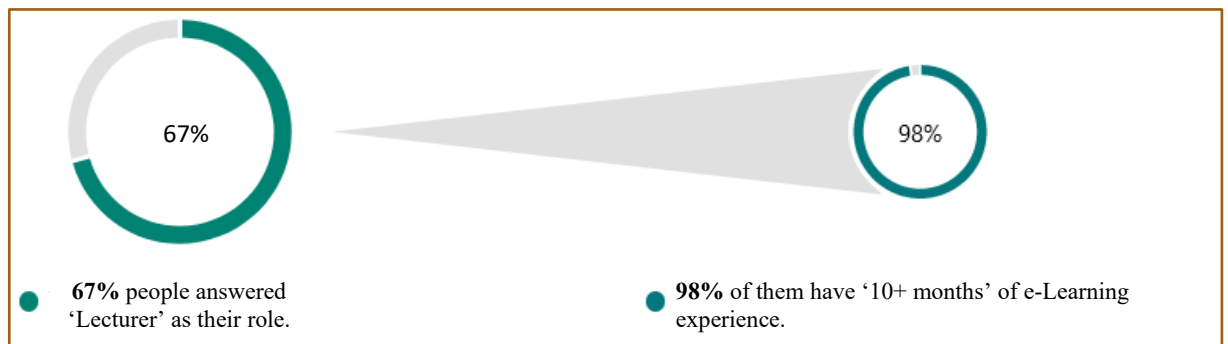


Figure 7: ‘Lecturer’ Respondents with ‘10+ Months’ e-Learning Experience

Most of the respondents (97%) with ‘Lecturer’ position are ‘Permanent’ employees of the University – a key characteristic in bringing pedagogical stability, see *Figure 8* below.

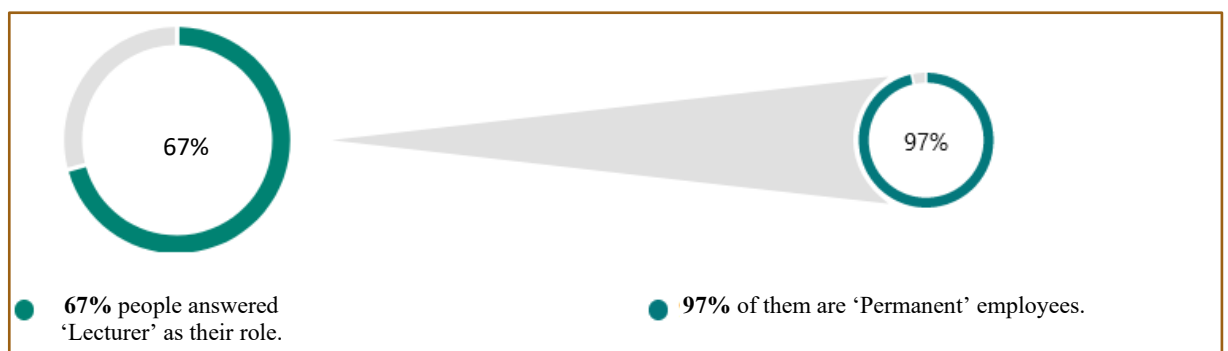


Figure 8: ‘Lecturer’ Respondents who are of ‘Permanent’ Employee Type

Type of Employment

Eighty-four percent (84%) of the respondents answered ‘Permanent’ as their employment type, and 16% are ‘Contract’ hires, see *Figures 9 and 10* below. The following statistical measures were derived: the modal Employee Type was ‘Permanent’, overall average responses by Employee Type is 122.5 responses, the median Employee Type is ‘Permanent’, both Employee Types responded with a minimum of 38 responses per Employee Type, and a maximum of 207 responses per Employee Type.



Figure 9: Employee Type Frequency

Most (94%) of the ‘Permanent’ staff had ‘10+ months’ e-Learning experience – a feature that is of great significance to pedagogics through e-Learning, see *Figure 10* below. A smaller proportion of 6% ‘Permanent’ staff had less than ten months of e-Learning experience.

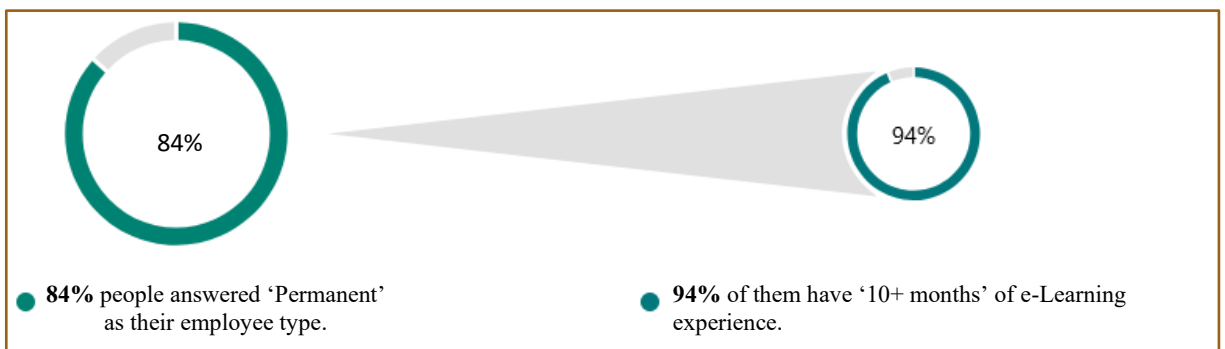


Figure 10: Respondents of ‘Permanent’ Employee Type with ‘10+ Months’ e-Learning Experience

Gender

Female respondents were 116 (47%), male respondents were 128 (52%), and one person preferred not to specify their gender, see *Figures 11, and 12* below. The following statistical measures were derived: the modal Gender was ‘Male’, overall average responses by Gender are 81.67 responses, the median Gender is ‘Male’, all 3 Genders responded with a minimum of 1 response per Gender, and a maximum of 128 responses per Gender.

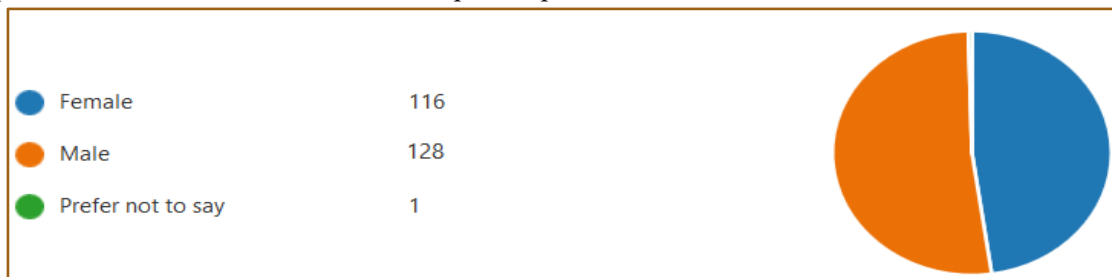


Figure 11: Frequency of Respondents by Gender

Of the forty-seven percent (47%) female respondents, most (92%) had ‘10+ months’ e-Learning experience as shown in *Figure 12* below. Four percent (4%) females had ‘7 – 9 months’ e-Learning experience, one percent (1%) had ‘4 – 6 months’ e-Learning experience, and 3% had ‘0 – 3 months’ e-Learning experience.

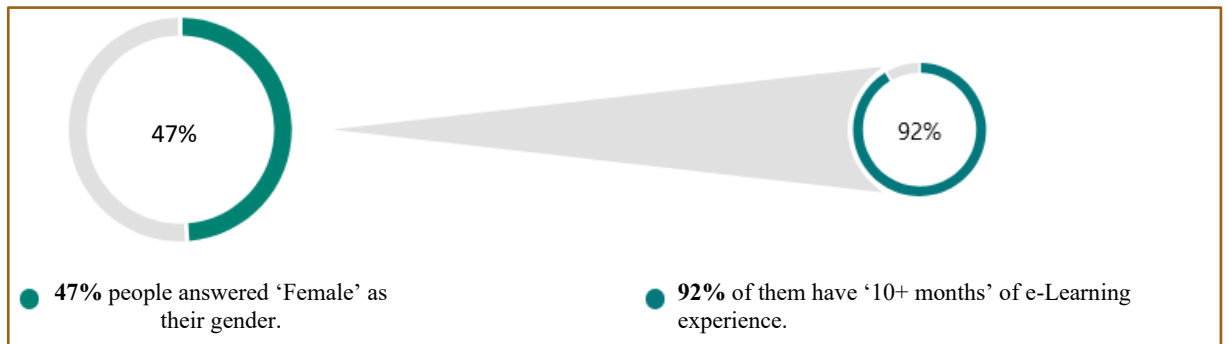


Figure 12: ‘Female’ Respondents with ‘10+ Months’ e-Learning Experience

Of the fifty-two percent (52%) male respondents, most (84%) had ‘10+ months’ e-Learning experience while 7% had ‘7 – 9 months’ e-Learning experience, 4% had ‘4 – 6 months’ e-Learning experience, and 5% had ‘0 – 3 months’ e-Learning experience.

Respondent Age Range in Years

Sixty percent (60%) of people were in the ‘40 – 49’ years age group, 18% were in the ‘30 – 39’ years age group, 9% were in the ‘60+’ years age group, 8% were in the ‘50 – 59’ years age group, and 4% were in the ‘20 – 29’ years age group, see *Figures 13, 14, 15, and 16* below. Most staff (78%) were in the age range 30 – 49 years. The following statistical measures were derived: the modal Age Range was ‘40 – 49’, overall average responses by Age Range are 45 responses, the median Age Range is ‘40 – 49’, all 5 Age Ranges responded with a minimum of 11 responses per Age Range, and a maximum of 146 responses per Age Range.

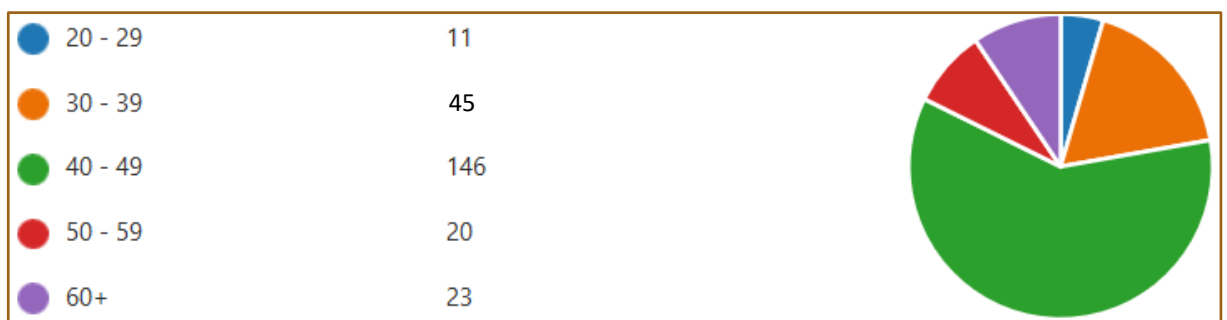


Figure 13: Age Range in Years Frequency

Most people (98%) in '40 – 49' age group were '10+ months' experienced in e-Learning as shown in *Figure 14* below – demonstrating a competitive pedagogical delivery.

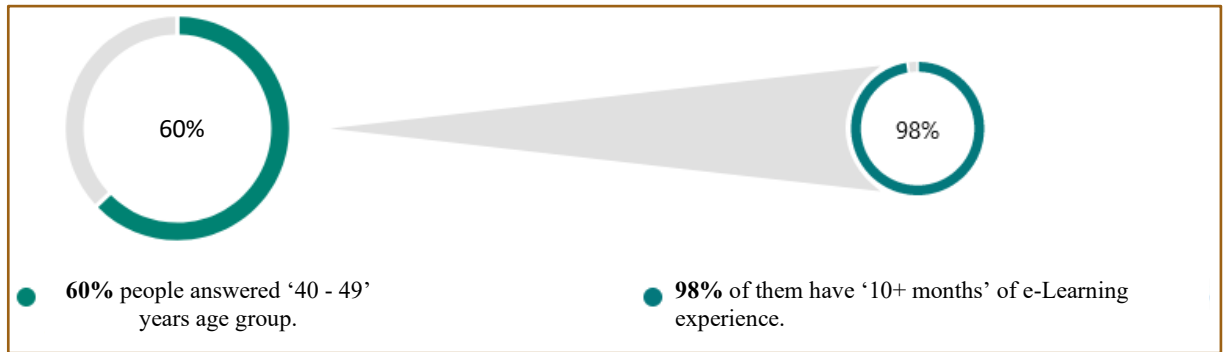


Figure 14: Most Respondents' Age Range with '10+ Months' e-Learning Experience

Most people (96%) in '40 – 49' age group were 'Permanent' hires as shown in *Figure 15* below.

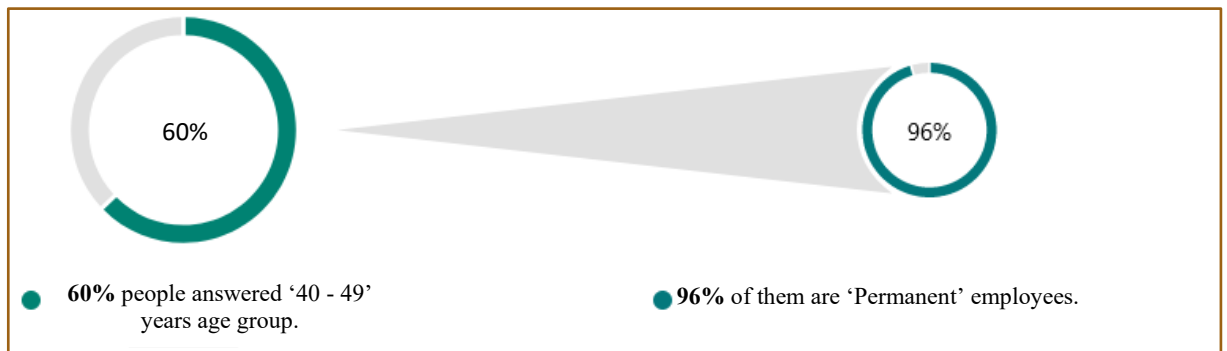


Figure 15: Most Respondents' Age Range with a 'Permanent' Employee Type

Most people (93%) in '40 – 49' age group held the 'Lecturer' position as shown in *Figure 16* below. Most Lecturers (60%) in the age group were female and 95% of female Lecturers in this age group were 'Permanent' University employees, of whom 99% of them had more than ten (10+) months of e-Learning pedagogical delivery experience.

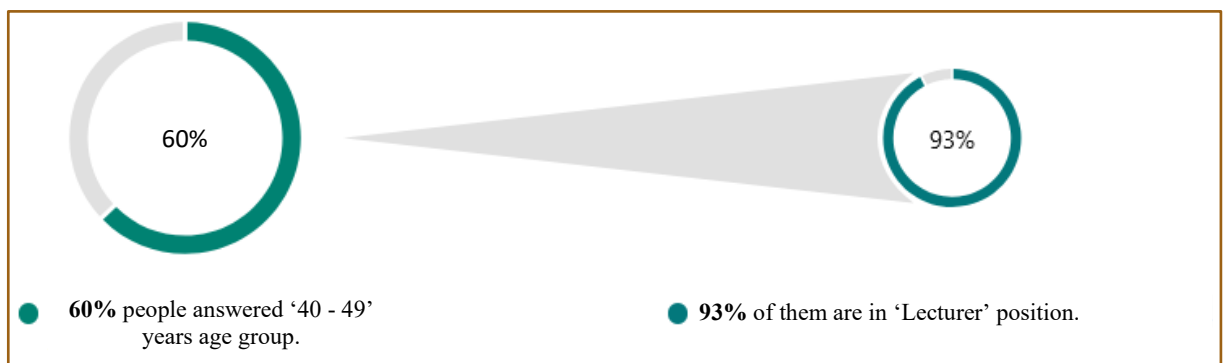


Figure 16: Most Respondents' Age Range with a 'Lecturer' Position

The academic staff's age responses distribution shows a normal (Gaussian) distribution, demonstrating a probability distribution that is symmetric about the mean. It implies that data near the mean are more frequent in occurrence than data far from the mean. *Figure 17* below illustrates this enunciation – normal distribution curve. The showing of the bell-shaped curve from this data gives the significance and credence to how the respondents were sampled from the population, that is, randomly – reinforcing validity and reliability of the gathered data and the outcome is phenomenally balanced. This determination is fundamental in defining whether to

apply parametric or non-parametric statistical tests where inferential statistics is used to derive estimations – improving the generalisability of sampled data to a broader population.

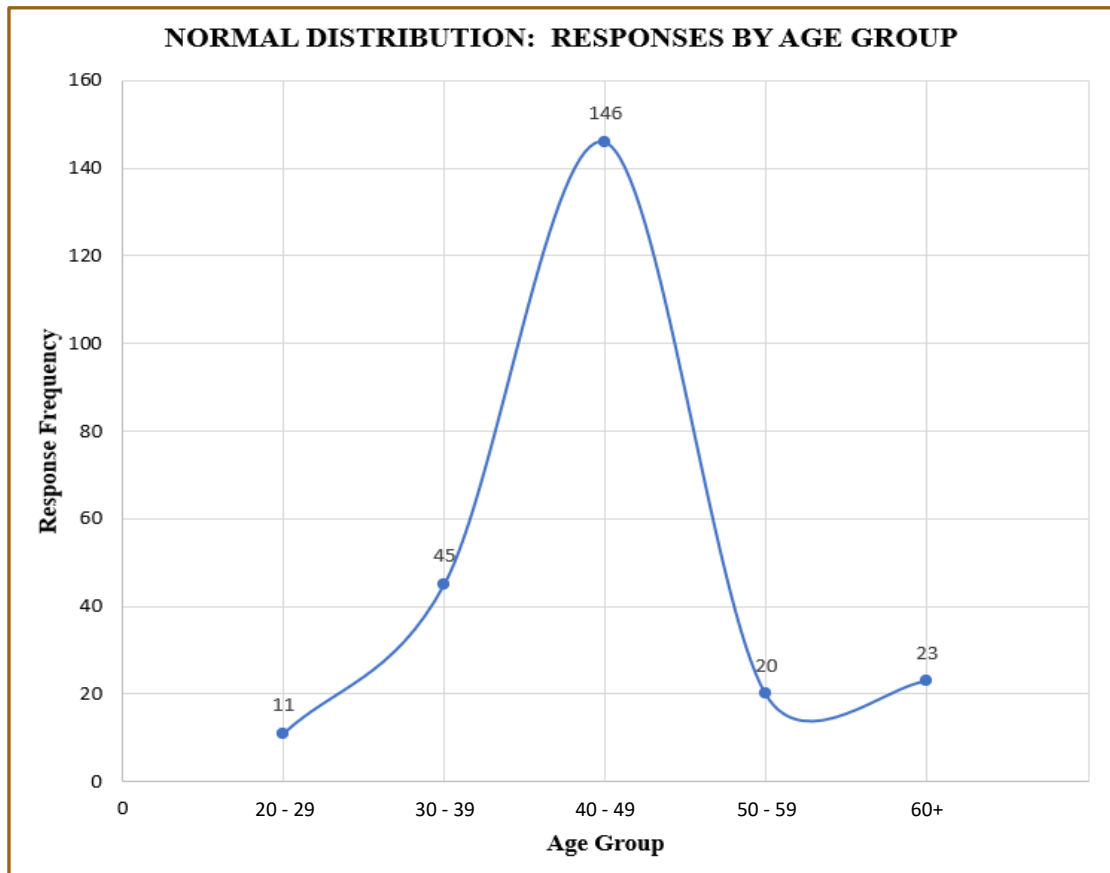


Figure 17: Normal Distribution – Responses by Age Group

Experience in Using e-Learning

Most people (87%) had been using e-Learning for more than ten months and a few (2%) were between four and six months as illustrated in *Figure 18* below. The following statistical measures were derived: the modal e-Learning experience range was ‘10+ months’, overall average responses per experience range is 61.25 responses, the median experience range is ‘10+ months’, all 4 experience ranges responded with a minimum of 6 responses per experience range, and a maximum of 212 responses per experience range.



Figure 18: Frequency of Respondents by e-Learning Experience

The background demographic data has shown that 96% of the respondents had more than three months of e-Learning experience, a fundamental trait in effective and pragmatic pedagogical delivery through use of technology – realising the connectivism theory. The pandemic outbreak

presented an opportunity to broaden exposure to e-Learning for the less experienced 4% staff. There is only five percentage points difference between male and female respondents, with the former being more at 52% and the later standing at 47% – relatively balanced.

4.2 Availability of e-Learning Resources

The extent to which respondents agreed with the statement pertaining to adequacy of resources and the immediacy in which the resources were provisioned is illustrated in *Figure 19* and *Table 5* below sums it up. Adequate e-Learning tools were available e.g. Collaboration tools such as Microsoft Teams, Zoom – 85.6%. Tools were immediately (within ONE month) available after COVID-19 outbreak – 82.7%. Adequate training webinars on use of tools such as Canvas, Zoom were available to help meet e-Learning goals – 71.2%. Training webinars on use of tools such as Canvas, Zoom were immediately (within ONE month) available after COVID-19 outbreak – 70.4%. Adequate help and support were available in developing/designing e-Learning material from Lund University help desk e.g. videos, presentations – 73.3%. Help and support were immediately (within ONE month) available after COVID-19 outbreak – 71.6%. The overall e-Learning help and support were adequate to cover e.g. Lectures, Workshops, Student Evaluations/Assessments/Assignments – 72.4%. Overall e-Learning help and support were immediately (within ONE month) available after COVID-19 outbreak – 70.8%.

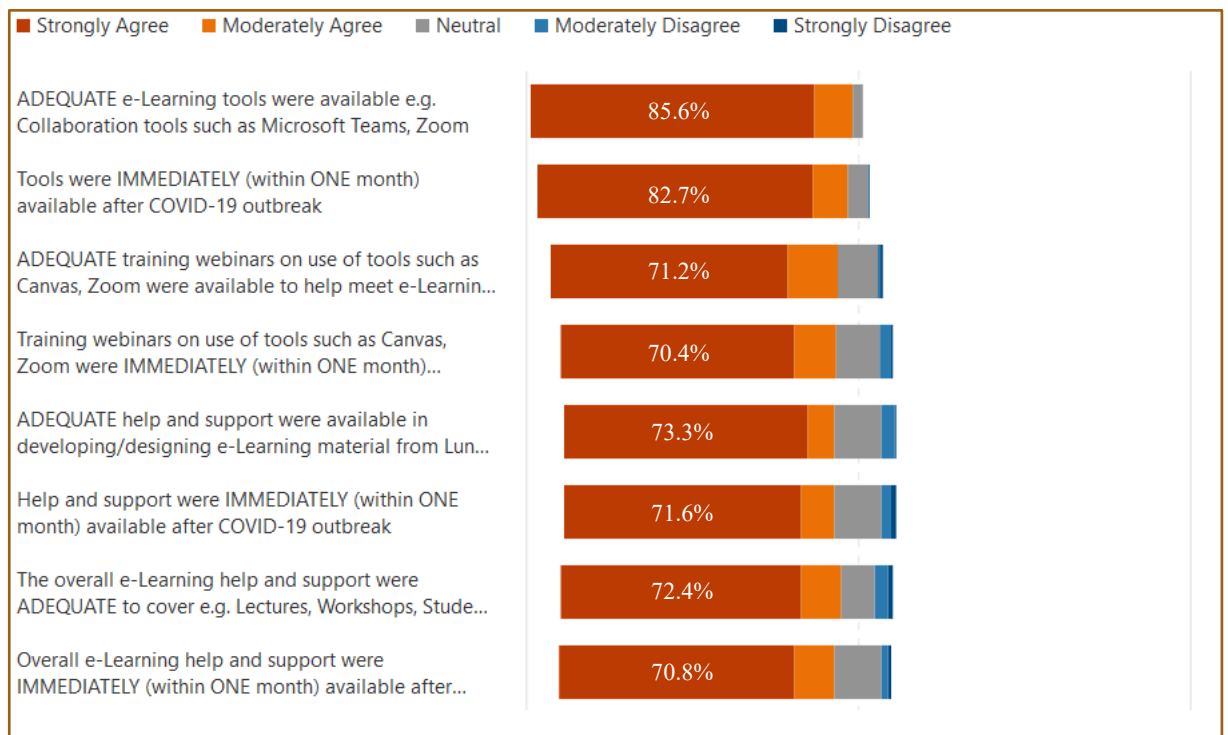


Figure 19: Adequacy of e-Learning Resources Responses

Availability of e-Learning resources category which attests to the adequacy of e-Learning materials as provisioned by Lund University in its response to the pandemic, enabling continuity in pedagogical delivery is further challenged to its timeliness in making such resources available. Timely resource delivery was critical as it would make or break the e-Learning process. As demonstrated in *Figure 19*, most respondents strongly agreed that adequate e-Learning tools were availed within one month, a high responsiveness by the University given the fact that there was no pre-planning of this occurrence. To ensure effectiveness in teaching and learning, the University was upfront in giving webinars to upskill staff in the use of e-Learning tools. This study shows that many of the respondents concur with the fact that the training was adequate and immediately available to avoid prolonged inefficiencies. Further, most respondents agreed that

the help and support rendered by the University was tremendous and timely. *Table 5* below sums it up by highlighting the response frequencies deduced from the data gathered.

Table 5: Resource Adequacy – Response Frequency and Mean

#	STATEMENT	CATEGORY I: Lund University Resources for e-Learning FREQUENCY				
		Strongly Agree	Moderately Agree	Neutral	Moderately Disagree	Strongly Disagree
1a	Adequate e-Learning tools were available e.g. Collaboration tools such as Microsoft Teams, Zoom	210	28	7	0	0
1b	Tools were immediately (within ONE month) available after COVID-19 outbreak	203	26	15	0	1
2a	Adequate training webinars on use of tools such as Canvas, Zoom were available to help meet e-Learning goals	175	37	29	2	2
2b	Training webinars on use of tools such as Canvas, Zoom were immediately (within ONE month) available after COVID-19 outbreak	173	30	32	9	1
3a	Adequate help and support were available in developing/ designing e-Learning material from Lund University help desk e.g. videos, presentations	180	19	35	9	2
3b	Help and support were immediately (within ONE month) available after COVID-19 outbreak	176	24	34	8	3
4a	The overall e-Learning help and support were adequate to cover e.g. Lectures, Workshops, Student Evaluations/ Assessments/Assignments	178	29	25	9	4
4b	Overall e-Learning help and support were immediately (within ONE month) available after COVID-19 outbreak	173	29	35	5	3
	MEAN	183.5	27.8	26.5	5.3	2.0

4.3 e-Learning Versus Contact Learning

The extent to which respondents agreed with the statement pertaining to e-Learning versus Contact Learning is illustrated in *Figure 20* and *Table 6* below. Contact Learning contributes significantly to boosting students' academic achievement over e-Learning – 75.7%. Continuous exposure to electronic screens in e-Learning is tiring and exhausting – 63.0%. The volume of assignments via e-Learning led to confusion, frustration, and poor Student performance – 65.8%. Continuing with the e-Learning model is not recommended because it is socially and

psychologically unhealthy – 67.1%. Contact learning contributes to strengthening the social personality of students over e-Learning – 82.7%.

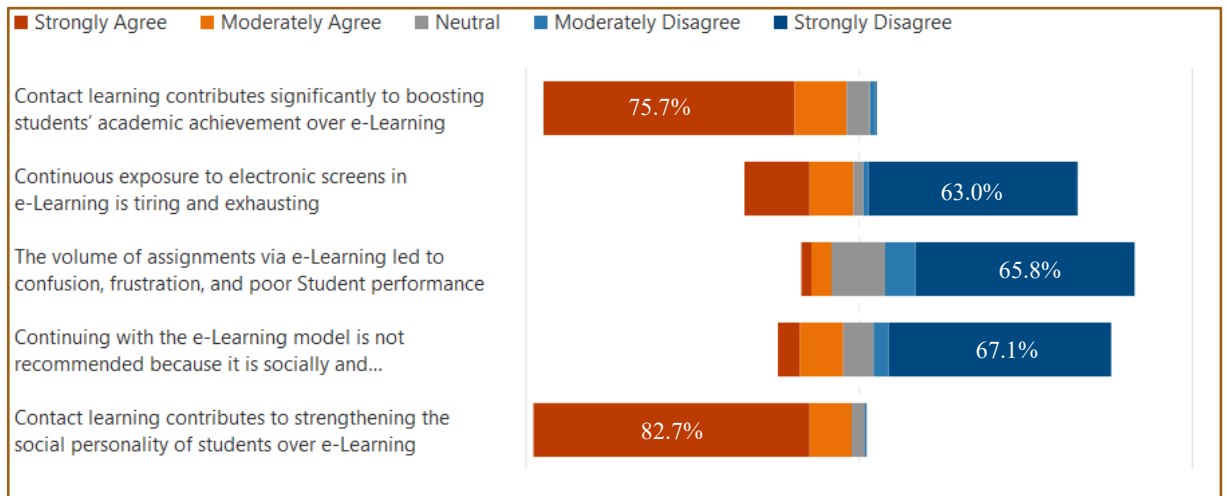


Figure 20: e-Learning Unlike Contact Learning Responses

Apparently, this study revealed a conspicuous support for both e-Learning and Contact Learning by the academic staff, the survey outcome of this category was determinant to this conviction. It was the respondents' assertion that Contact Learning contributes significantly to students' academic achievement and strengthens students' social personality. Contact Learning wins here. However, most respondents feel that increased screen time in e-Learning is not that tiring, nor is the proportion of work and assignments through e-Learning is frustrating and degrading to students' performance. Support for e-Learning in this respect. On continuing with e-Learning over its perceived psycho-social ills, the respondents were unshaken in support for e-Learning. The researcher's perspective to this outcome was that respondents are considerably inclined to a hybrid setup of e-Learning and Contact Learning drawing out an equilibrium state – a break even. Table 6 below, expounds the alpha and omega of this category as derived from the data.

Table 6: e-Learning Unlike Contact Learning – Response Frequency and Mean

#	STATEMENT	CATEGORY II: e-Learning Unlike Contact Learning FREQUENCY				
		Strongly Agree	Moderately Agree	Neutral	Moderately Disagree	Strongly Disagree
6	Contact Learning contributes significantly to boosting students' academic achievement over e-Learning	186	38	16	4	1
7	Continuous exposure to electronic screens in e-Learning is tiring and exhausting	47	32	7	4	155
8	The volume of assignments via e-Learning led to confusion, frustration, and poor Student performance	7	15	39	22	161
9	Continuing with the e-Learning model is not recommended because it is socially and psychologically unhealthy	16	31	23	10	165

10	Contact Learning contributes to strengthening the social personality of students over e-Learning	203	31	9	2	0
	MEAN	91.8	29.4	18.8	8.4	96.4

4.4 e-Learning Evaluation and Assessment

The extent to which respondents evaluated and assessed e-Learning is illustrated in *Figure 21* and *Table 7* below recaps it all. Prolonged use of e-Learning tools often leads to boredom, nervousness, and tension in both Lecturers and Students – 64.2%. Quality of teaching in e-Learning was satisfactory – 68.3%. Giving quizzes and exams online was not comfortable and made me nervous as e-Learning is not secure or fool-proof – 67.5%. Lecturer-Student interaction isolation has increased impacting e-Learning negatively – 64.2%. Measures of lockdown, closures, and quarantine, brought by COVID-19 caused stress, frustration, and depression impacting e-Learning negatively – 64.2%.

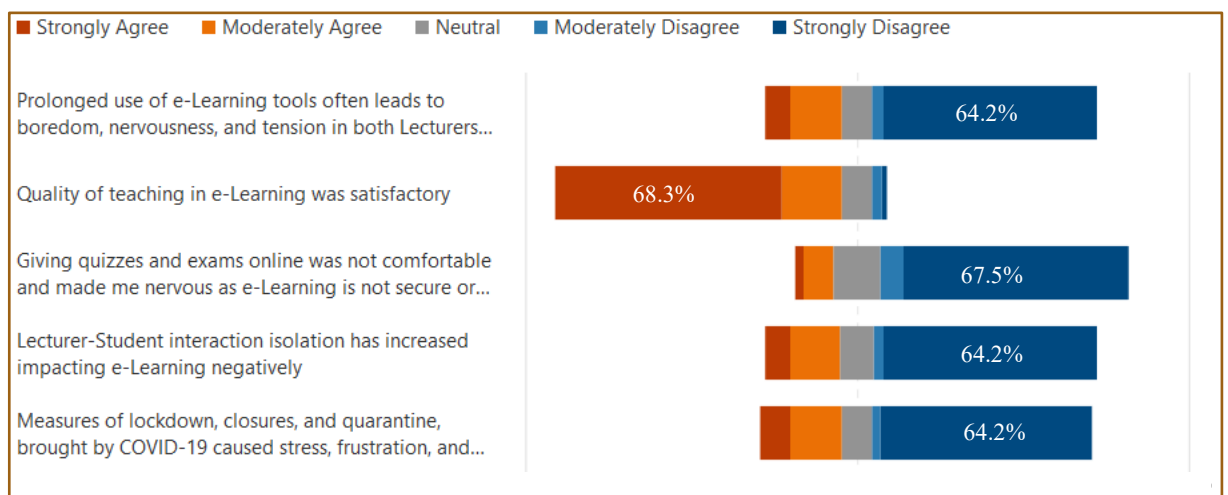


Figure 21: e-Learning Evaluation and Assessment Responses

The respondents' assessment and evaluation outcome of this category gave e-Learning a positive outlook, verily so. Most respondents strongly agreed that the quality of teaching through e-Learning was reasonably up to the mark. The result of this category is clearly in strong disagreement to whether; the prolonged use of e-Learning cause distress; administering exams online was not secure; Lecturer-Student relationship became distant; and COVID-19 confinement measures were a source of depression in e-Learning. This result comparatively leaves e-Learning in good placing. *Table 7* below wraps up this category with a show of response frequencies.

Table 7: e-Learning Evaluation and Assessment – Response Frequency and Mean

#	STATEMENT	CATEGORY III: e-Learning Evaluation and Assessment FREQUENCY				
		Strongly Agree	Moderately Agree	Neutral	Moderately Disagree	Strongly Disagree
11	Prolonged use of e-Learning tools often leads to boredom, nervousness, and tension in both Lecturers and Students	18	38	23	8	158
12	Quality of teaching in e-Learning was satisfactory	168	45	21	8	3
13	Giving quizzes and exams online was not comfortable and made me nervous as e-Learning is not secure or fool-proof	6	23	33	18	165
14	Lecturer-Student interaction isolation has increased impacting e-Learning negatively	18	37	24	8	158
15	Measures of lockdown, closures, and quarantine, brought by COVID-19 caused stress, frustration, and depression impacting e-Learning negatively	21	38	23	5	158
	MEAN	46.2	36.2	24.8	9.4	128.4

4.5 Overview of e-Learning Perceptions

Table 8 below, illustrates a summarised view of the key take away from the response data for each question per category.

Table 8: Overview of e-Learning Perceptions

CATEGORY	RESPONSE SUMMARY
<p>Category I:</p> <p>Availability of e-Learning Resources</p>	<ol style="list-style-type: none"> i. Adequate e-Learning tools were available e.g. Collaboration tools such as Microsoft Teams, Zoom → <i>85.6% Strongly Agree.</i> ii. Tools were immediately (within ONE month) available after COVID-19 outbreak → <i>82.7% Strongly Agree.</i> iii. Adequate training webinars on use of tools such as Canvas, Zoom were available to help meet e-Learning goals → <i>71.2% Strongly Agree.</i> iv. Training webinars on use of tools such as Canvas, Zoom were immediately (within ONE month) available after COVID-19 outbreak → <i>70.4% Strongly Agree.</i> v. Adequate help and support were available in developing/designing e-Learning material from Lund University help desk e.g. videos, presentations → <i>73.3% Strongly Agree.</i> vi. Help and support were immediately (within ONE month) available after COVID-19 outbreak → <i>71.6% Strongly Agree.</i>

	<p>vii. The overall e-Learning help and support were adequate to cover e.g. Lectures, Workshops, Student Evaluations/Assessments/Assignments → 72.4% <i>Strongly Agree</i>.</p> <p>viii. Overall e-Learning help and support were immediately (within ONE month) available after COVID-19 outbreak → 70.8% <i>Strongly Agree</i>.</p>
<p>Category II: e-Learning Versus Contact Learning</p>	<p>i. Contact Learning contributes significantly to boosting students' academic achievement over e-Learning → 75.7% <i>Strongly Agree</i>.</p> <p>ii. Continuous exposure to electronic screens in e-Learning is tiring and exhausting → 63% <i>Strongly Disagree</i>.</p> <p>iii. The volume of assignments via e-Learning led to confusion, frustration, and poor Student performance → 65.8% <i>Strongly Disagree</i>.</p> <p>iv. Continuing with the e-Learning model is not recommended because it is socially and psychologically unhealthy → 67.1% <i>Strongly Disagree</i>.</p> <p>v. Contact Learning contributes to strengthening the social personality of students over e-Learning → 82.7% <i>Strongly Agree</i>.</p>
<p>Category III: e-Learning Evaluation and Assessment</p>	<p>i. Prolonged use of e-Learning tools often leads to boredom, nervousness, and tension in both Lecturers and Students → 64.2% <i>Strongly Disagree</i>.</p> <p>ii. Quality of teaching in e-Learning was satisfactory → 68.3% <i>Strongly Agree</i>.</p> <p>iii. Giving quizzes and exams online was not comfortable and made me nervous as e-Learning is not secure or fool-proof → 67.5% <i>Strongly Disagree</i>.</p> <p>iv. Lecturer-Student interaction isolation has increased impacting e-Learning negatively → 64.2% <i>Strongly Disagree</i>.</p> <p>v. Measures of lockdown, closures, and quarantine, brought by COVID-19 caused stress, frustration, and depression impacting e-Learning negatively → 64.2% <i>Strongly Disagree</i>.</p>

The three main categories of this study demonstrated a fundamental positioning in Lund University's response to the pandemic. This research work established that, **first**, Lund University provisioned adequate e-Learning resources and timeously did so, thus **74.9%** of the respondents strongly agreeing; **second**, on e-Learning versus Contact Learning, there was a near balance but Contact Learning took the day with **39.4%** respondents vowing for it more than the **37.5%** for e-Learning, while 12% of the respondents were moderately in favour of e-Learning, 3.4% moderately for Contact Learning and 7.7% were equally split between e-Learning and Contact Learning, therefore, on a *balance of scales* e-Learning is the ultimate victor; and **third**, more than **65%** of the respondents evaluated and assessed e-Learning highly.

The above analysis is well summed up in *Figure 22* below where trend lines demonstrate how the respondents' opinions progressed showing the pattern of their perceptions. The mean responses per major quantitative survey category were used to plot the linear trend estimation analysis graph because the mean is the average or the most common value in a collection of numbers – respondents per opinion. In statistics, it is a measure of central tendency of a probability distribution along median and mode. It is also referred to as an expected value signifying its significance. **Category I**, where the adequacy and timely provisioning of e-Learning resources

was determined – the trendline shows that respondents were more in concurrence with the view, strongly agreeing. The *mean* responses per opinion were, strongly agree – 183.5, moderately agree – 27.8, neutral – 26.5, moderately disagree – 5.3, strongly disagree – 2.0. **Category II**, where a comparison between e-Learning and Contact Learning was drawn – the trendline illustrates a near equilibrium implying respondents favoured both e-Learning and Contact Learning almost equally. The *mean* responses per opinion were, strongly agree – 91.8, moderately agree – 29.4, neutral – 18.8, moderately disagree – 8.4, strongly disagree – 96.4. **Category III**, where e-Learning was evaluated and assessed whether it is bad and unfavourable – the trendline elaborately depicts that respondents strongly disagreed to the view, accepting that e-Learning is relatively good and favourable. The *mean* responses per opinion were, strongly agree – 46.2, moderately agree – 36.2, neutral – 24.8, moderately disagree – 9.4, strongly disagree – 128.4. The trendline analysis was conducted to give statistical meaningfulness of the data analysis done for this study. The presented illustration in *Figure 22*, for distinguishing statistically meaningful trends was uncomplicated for the researcher and was useful for determining which trends are worth analysing further in future studies, for instance with respect to causal factors. The illustration can also be used for determining which segments of a trend may be particularly worthwhile to focus on and dig deeper to draw more significant insights.

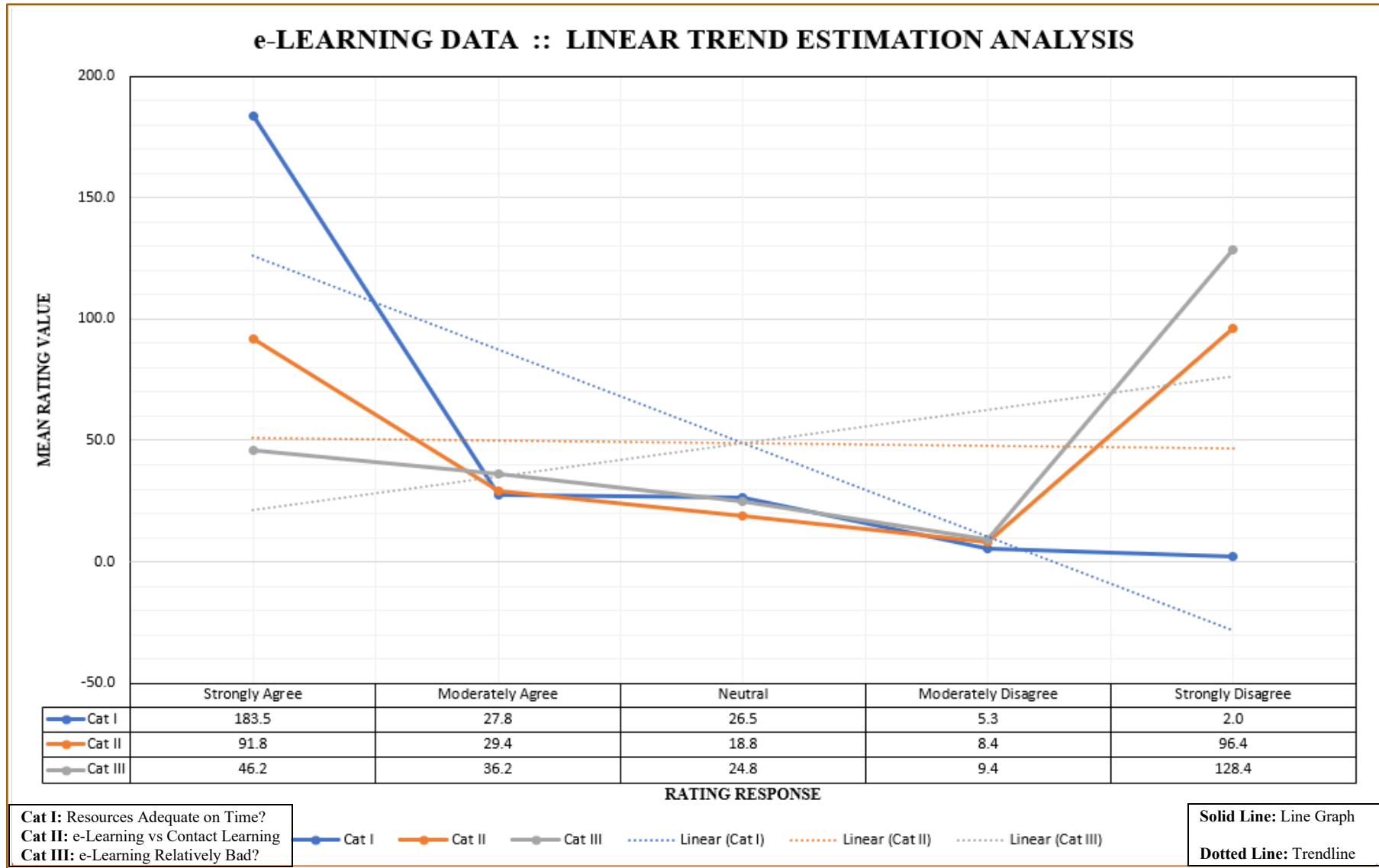


Figure 22: e-Learning Data - Linear Trend Estimation Analysis

5 Discussion

To explore Lund University's response to e-Learning during COVID-19, this study was conducted, and it drew results that asserts positivity and a conducive teaching and learning environment was enabled by the University albeit the pandemic. The implications of the research study, for both research and practice, is highlighted hereunder coupled with brief descriptions.

5.1 Implications for Research

The empirical evidence gathered from the study showed that irrespective of the disruption caused by the pandemic, teaching and learning continued. Immediate responses were developed primarily to control and curb the spread of the infection, measures taken included delivering learning through use of technology and practising suitable health measures (Marinoni, Van't Land, & Jensen, 2020). The research respondents do concur that devotion to 'emergency online education' (Marinoni, Van't Land, & Jensen, 2020) was necessary to continue serving the community. This triggered more research into understanding the impact of the sudden change and how to sustain stable continuity where infrastructure and digital resources are limited. Research work spiralled and will be ongoing for years to come.

The sudden compelling circumstances to shift to e-Learning and abruptly halt Contact Learning meant that students needed assistance; staff faced unprecedented challenges, including job insecurity; university leaders had to reinvent how to run their campus operations (Marinoni, Van't Land, & Jensen, 2020). The situation was clear that Contact learning had to transition to online learning (Thompson & Copeland, 2020). The transition, however, had to be carefully executed (Thompson & Copeland, 2020) to avoid missing other fundamental aspects for effective teaching – the academic staff had to adapt and ensure standards were maintained with full institutional support. The unprecedented circumstances posed a great challenge to research as the situation demanded there be more research to define new approaches to teaching and learning, the future of education, and applicable methods of pedagogical delivery. Nevertheless, in the current circumstances the study found out that there was sufficient help and support to drive teaching and learning aligning well with the available literature.

The presence and influence of information technology across all areas of society, concomitantly resulted in e-Revolution (Ching, Poon, & McNaught, 2006) – triggering massive returns for organisations invested in information technology business. Technology researchers were being challenged to quickly review the efficacy of tools on offer and how best they can be improved to effectively enhance and improve sustenance of life, the new normal as it arises. Technology infrastructure provisioning needed revamp and reshaping to meet the new demands of being in class away from the physical classroom. As derived from this study results, the institution provisioned the necessary digital tools to facilitate continuity in learning during the pandemic. The pandemic state signified difficulties to keep students' interest and attention to proper teaching and learning new concepts and, also for teachers to be effective in pedagogical delivery (Jena, 2020). Redefining and reinventing the modalities that are conducive to effective learning became the challenge for research, new ways and methods had to be worked out quick and fast, thus fast, and furious. Clinical and Educational psychologists will make profound findings in their studies determining the impact of the pandemic on students and society in general. However, the study respondents believed COVID-19 did not impact e-Learning negatively.

Learning through technology, integrating the principles explored by chaos, network, and complexity (Anderson, 2008) deriving from the Connectivism theory of learning simply meant practicality to the constructs of the theory were at play. The question that remains open to research is whether the theory suffices in such demanding circumstances, how best can it be improved or morphed into yet a new pandemic theory of learning – research remains abound. The study determined that prolonged use of e-Learning tools did not lead to boredom in the teaching staff.

Rosset (2002) propounds it that e-Learning has many promises if resources and teaching staff are committed in doing it right with well-designed e-Learning material. This was a proposition. Did it hold firm in the pandemic scenario we had? The design of learning material is time consuming and the endless challenges in equitability of resources, how could this be rationalised and balanced? Further research work is paramount to investigate, review, and improve provisioning of resources on demand – COVID-19 needed a sudden, combative, and effective reaction if teaching and learning were to progress meaningfully. Despite the need for further research the study noted that the quality of e-Learning in pandemic times was satisfactory.

The study showed that teaching and learning was successful through forming connections between people and digital technology (Siemens, 2004; Yurkiw, 2017). This study concurs with the view that to cope with information overload and complexity, teaching and learning requires a determination, through research, on how coping can be accomplished without triggering socio-economic implications than there already was through the pandemic outbreak. This study revealed that, through technology, administering assessments (assignments, exams, quizzes) did not cause anxiety and insecurity to the teaching staff as students were quite responsive. According to Jena (2020), tomorrow is a new morning, a new dawn rises, marking a new beginning, new technologies challenging the traditional paradigms such as classroom lectures (Contact Learning), modes of learning and modes of assessment. The new trends will allow the education system to be evolved and revolutionised. Tomorrow's challenges can only be neutralised through today's research that sets the baseline and the grounds from which solutions can be derived. Certainly, old ways were challenged, resources made available to effect learning continuity with digital resources' use, with most of the research respondents agreeing on the timeous adequate availability of suitable resources irrespective of the immediate and spontaneous push for such digital tools.

e-Learning opens access to education and training provision, freeing learners from the constraints of time and place, and offering flexible learning opportunities to individuals and groups of learners (Pityana, 2009; Gaskell, 2017) and the study concurs with this view. In its goodness of fit to the pandemic situation, it also poses fresh challenges where infrastructural development and resource availability to enable the praxis is required. In such circumstances research needs to balance this off through determination of how best to proceed. Research enriches assumptions making them achievable with relative ease. The study gathered that the isolation of Student-Teacher interaction had little to insignificant effect on e-Learning delivery and its outcomes. This study concurs with existing research and literature on e-Learning and distance studying that it requires same digital learning tools (Stauffer, 2020; Gaskell, 2017). e-Learning and distance studying surfaced strongly in pandemic situations as that blend sustained continuity in education and learning. It remains key for research to keep determining continual improvement. Nevertheless, the pandemic confinement measures did not kill the spirit of teaching, research, and learning as was discovered from this study's results.

Blended education and learning involve a mix of approaches to pedagogical delivery (Arkorful & Abaidoo, 2015; Stauffer, 2020). As always, variety is the spice of life. When there is such a mix, students are motivated to learn leading to success, a drive for innovative thinking too. Study respondents were much inclined in support of blended learning approach balancing the shortcomings that exist with other methodologies that are non-blending. The study found out that the blending was vital and was to a great extent achievable through use of various e-Learning techniques. Distance learning relies on digital resources for effective delivery hence, students need regular access to computers or other devices during class, it is tough to truly implement online learning (Stauffer, 2020; Gaskell, 2017) if suitable resources are limited and a difficult reach for students. However, for Lund University which was premised by this study such applicable resources were available timeously for the academic staff to deliver with relative ease. Use of e-resources and devices was not determined as a deterrent factor to e-Learning and it progressed satisfactorily. Appropriate digital teaching and learning tools were in place to support

the perspective and cognitive development (Greany, 2019a; Greany, 2019b). Pedagogical delivery progressed well albeit the challenges and successes were realised, nonetheless. Criterion tasks include different outcome measures that are relevant to student achievement, such as those tapping memory, problem solving, and comprehension (Dunlosky, Rawson, Marsh, Nathan, et al., 2013). The study determined that this was achieved through administering of student assessments (assignments, examinations, workshops).

5.2 Implications for Practice

Following the breakout of the COVID-19 pandemic, Lund University was no exception to the impact of corona virus, and it was circumstantially compelled to adjust accordingly to proceed with teaching and learning amid the crisis. This it did and did very well basing on the findings of the study which emphatically show how timeously the University responded. On how adequate the e-Learning resources the University provided the study reveals a high rating from the respondents. On whether the resources were made available quick enough given the sudden call for remote learning the respondents strongly agreed that turn around time was immediate and satisfactory given the circumstances. There was a complete adjustment to social activities during the pandemic and new trends post COVID-19 began to rise – the new normal.

Learning with social distancing became the norm – avoidance of warm handshakes, hugs, and keeping social distance may subsist (Bender, 2020) and it did subsist. However, this did not deter the spirit of continuity with quality teaching and learning. The study exhibited that continuing with the e-Learning model is recommended even though it is socially and psychologically unhealthy. That demonstrated the support the University received from the stakeholders to sustain teaching and learning. The University reciprocated this gesture by ensuring that the necessary resource provisioning, support, and availability was not compromised. The pandemic circumstances may continue promoting a mix of Contact Learning and e-Learning; student debt crisis may rise – coupled with loss of jobs, pressure mounts on servicing debts turning into a crisis, economies took a deep in the pandemic; unemployment rates may rise – exerting pressure on government and its social and unemployment support structures (Jena, 2020; Bender, 2020). Such are the after-effects of a breakout and the society at large should stand firm and hold fort. The study demonstrated that Contact Learning contributes to strengthening the social personality of students over e-Learning, making it important for a blended approach to keep everyone well-grounded and subsequently society at large.

Online learning systems are a key time saver as they can grade and assess students' work and report to the authorities (Stauffer, 2020; Gaskell, 2017). Cheating can occur when online learning digital tools are in use, though cheating cannot be fully stopped with digital curriculum resources, there are ways to reduce cheating, for example using Urkund for plagiarism. Respondents found it comfortable to administer quizzes and exams online and were not nervous as e-Learning is secure or fool-proof. This is encouraging as that promotes pandemic controls and still maintain quality student evaluation and assessment. Distance learning and e-Learning can continue uninterrupted even when adversity strikes or the COVID-19 pandemic (Stauffer, 2020; DLCCG, 2015). In such circumstances interruptions are minimal, only where base infrastructure is destroyed but with Business Continuity Management (BCM) Disaster Recovery (DR) measures are activated for continued sustenance.

Distance learning forges difficulties to constantly check if students are working, teacher has no access to walk arounds seeing what students are busy with on their screens as the case could be in a classroom; this leads to social seclusion and isolation (DLCCG, 2015). Assessments that administered help keep this in check. Cheating is made easy through distance studying and learning than via online learning; high screen time is prevalent in both e-Learning and distance education for learners, unfortunately the teacher cannot manage, avoid, and control this (due to digitised channel communication) unlike with online learning (Stauffer, 2020; Gaskell, 2017).

However, the study has shown that the upside of e-Learning outweighs the disadvantages and appropriate measures help keep reliability in place. In the event of pandemics, the strategies can be used variably to enable continuity in education delivery (Stauffer, 2020), nonetheless they are all subject to effects of COVID-19. The fundamental aspect is that life does not come to a complete halt, suitable measures that enable some reliable continuity in teaching and learning are abundant and to a greater extent productivity is sustained. The study findings affirm to this.

Engaging and effective e-Learning material that is designed through understanding contemporary learners and what would assist them up their outcomes and construct fresh habits, practices, knowledge, and proficiency (Greany, 2019a; Greany, 2019b) is fundamental. Lund University was ahead in provisioning suitable help and support to facilitate effective and pragmatic teaching and learning. The study attest to it that they were not suffocated by limited resources in their endeavour to deliver quality pedagogy to the benefit of the learner – quite encouraging. Modern e-Learning examples to inspire students include scenario-based learning (video and audio e-Learning); microlearning (performance support resources and blended learning campaigns); personalised learning (diagnostics and discovery and digital toolkit exploratory learning); and storytelling for learning (digital storytelling) (Greany, 2019a). All these pedagogical techniques were applied variably to maintain teaching and learning standards. Respondents resoundingly concurred that the quality of teaching in e-Learning was satisfactory. Effective mobile learning – not just mobile content; integration and flow – learning should be continuous assisting learners through their digital computer aided learning experience; more self-directed learning; and use of videos and more videos (Greany, 2018; Steen, 2008). The study showed that volume of assignments, workshops, exercises, via e-Learning did not lead to confusion, frustration, and poor Student performance, in fact, the delivery quality was great.

6 Conclusion and Future Work

In peroration, the writer draws the reader to the study research question as supported by its underlings of aim, objectives, and purpose – the findings of the study demonstrated that Lund University's response to the pandemic in facilitating continuity in effective and pragmatic learning was met and achieved to a greater extent, satisfactorily so. The three main survey categories revealed and uncovered that e-Learning was evaluated and assessed exceedingly well; resources provided were adequate and relatively timeous to achieve quality pedagogical delivery; and the comparative of e-Learning and Contact Learning established a near balanced outcome finishing on a derived consensus that a blended learning approach was more appropriate and fruitful.

The e-Learning tools such as Zoom facilitate learning and the pedagogical skills of the teacher are fundamental in the effectiveness of the tool. There was good technical support on e-Learning tools, however, there was very little time to learn how to use them in pedagogically sound ways – this caused an immense amount of stress. e-Learning is good as part of a hybrid learning approach. Effects of COVID-19 induced restrictions is something that psychologists will need to study for years to determine. Teachers found support from peers and occasionally used whatever YouTube and other Internet resources available without paying much attention to which organizations that hosted the support resources. These are some views respondents shared with the researcher.

The study was premised on Lund University as the case study, it would be great to broaden the research and cover more than one Higher Education Institution (HEI) in Sweden and other countries, giving the study a national, regional, continental, and global perspective. The data analysis and interpretation of the study was of descriptive statistics and in future a further step into inferential statistical analysis would give more insights. As the study applied quantitative methodology, in future applying a qualitative approach or a hybrid (quantitative and qualitative) could unpack interesting new perspectives and insights. The study was restricted to academic and teaching staff, it would be insightful to include students in future.

Appendix A – Questionnaire

Questionnaire Link → <https://forms.office.com/r/4CtFkjBicj>



Questionnaire QR Link →



Master Thesis 2021 :: e-Learning in the Aftermath of COVID-19 ::

The survey will take approximately 5 minutes to complete

By submitting the questionnaire responses, the Participant/Respondent do consent to:

1. Participate voluntarily in the research project
2. Participate anonymously granting confidentiality and privacy
3. The use of response data in research, publications, sharing and archiving as is necessary

Disclaimer: Data handling => The University applies the General Data Protection Regulation (GDPR) and supplementary legislation.

1 Master Thesis 2021 :: QUESTIONNAIRE ::						
e-Learning in the Aftermath of the 2020 Pandemic ::						
#	Field	Section I: Background Information				
1	Department	...60 Depts				
2	Position	...8 Posts				
3	Employee Type	Permanent Contract				
4	Gender	Female Male Prefer not to say				
5	Age Range in Years	20-29 30-39 40-49 50-59 60+				
6	How many months have you been using e-Learning	0-3 4-6 7-9 10+				
#	Statement	SECTION II: Lund University Resources for e-Learning				
		Strongly Agree	Moderately Agree	Neutral	Moderately Disagree	Strongly Disagree
1a	Adequate e-Learning tools were available e.g. Collaboration tools such as Microsoft Teams, Zoom					
1b	Tools were immediately (within ONE month) available after COVID-19 outbreak					
2a	Adequate training webinars on use of tools such as Canvas, Zoom were available to help meet e-Learning goals					
2b	Training webinars on use of tools such as Canvas, Zoom were immediately (within ONE month) available after COVID-19 outbreak					
3a	Adequate help and support were available in developing/designing e-Learning material from Lund University help desk e.g. videos, presentations					
3b	Help and support were immediately (within ONE month) available after COVID-19 outbreak					
4a	The overall e-Learning help and support were adequate to cover e.g. Lectures, Workshops, Student Evaluations/Assessments/Assignments					
4b	Overall e-Learning help and support were immediately (within ONE month) available after COVID-19 outbreak					
#	Statement	SECTION III: e-Learning unlike Contact Learning				
		Strongly Agree	Moderately Agree	Neutral	Moderately Disagree	Strongly Disagree
6	Contact learning contributes significantly to boosting students' academic achievement over e-Learning					
7	Continuous exposure to electronic screens in e-Learning is tiring and exhausting					
8	The volume of assignments via e-Learning led to confusion, frustration, and poor Student performance					
9	Continuing with the e-Learning model is not recommended because it is socially and psychologically unhealthy					
10	Contact learning contributes to strengthening the social personality of students over e-Learning					
#	Statement	SECTION IV: e-Learning Evaluation and Assessment				
		Strongly Agree	Moderately Agree	Neutral	Moderately Disagree	Strongly Disagree
11	Prolonged use of e-Learning tools often leads to boredom, nervousness, and tension in both Lecturers and Students					
12	Quality of teaching in e-Learning was satisfactory					
13	Giving quizzes and exams online was not comfortable and made me nervous as e-Learning is not secure or fool-proof					
14	Lecturer-Student interaction isolation has increased impacting e-Learning negatively					
15	Measures of lockdown, closures, and quarantine, brought by COVID-19 caused stress, frustration, and depression impacting e-Learning negatively					

Questions

Responses 245



Master Thesis 2021 :: e-Learning in the Aftermath of COVID-19 ::



The survey will take approximately 5 minutes to complete

By submitting the questionnaire responses, the Participant/Respondent do consent to:

1. Participate voluntarily in the research project
2. Participate anonymously granting confidentiality and privacy
3. The use of response data in research, publications, sharing and archiving as is necessary

Disclaimer: Data handling => The University applies the General Data Protection Regulation (GDPR) and supplementary legislation.

Appendix B – Consent Form

	<p>LUND UNIVERSITY School of Economics and Management</p>	
<p>09th April 2021</p>		
<p>TO WHOM IT MAY CONCERN</p>		
<p>By submitting the questionnaire responses, I (the Participant/Respondent) do consent to:</p>		
<p>1.</p>	<p>Participate voluntarily in the research project.</p>	<p><input checked="" type="checkbox"/></p>
<p>2.</p>	<p>Participate anonymously granting me confidentiality and privacy.</p>	<p><input checked="" type="checkbox"/></p>
<p>3.</p>	<p>The use of my response data in research, publications, sharing and archiving as is necessary.</p>	<p><input checked="" type="checkbox"/></p>
<p>Thank you.</p>		
		
<p>RESEARCHER</p>		

Appendix C – Cover Letter



LUND UNIVERSITY

School of Economics and Management

26th April 2021

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

The survey will take approximately 5 minutes to complete ><https://forms.office.com/r/4CtFkjBicj><

I am carrying out a study on how e-Learning progressed at Lund University during the COVID-19 pandemic times. The research is a requirement for the partial fulfilment of the Master's studies in Information Systems offered by Lund University School of Economics and Management (LUSEM).

I am kindly requesting you to respond to the **Questionnaire on the links below**. All responses are strictly private, confidential, and anonymous and shall be used for this research, therefore, to maintain anonymity and confidentiality please do not write/type your name anywhere on the form.

{

QUESTIONNAIRE LINKS

<https://forms.office.com/r/4CtFkjBicj>



}

Yours faithfully,

A black and white image of a handwritten signature, which appears to be 'Lebo Lebohang', written over a dark background.

RESEARCHER

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