

**MAKERERE UNIVERSITY**

**MAKERERE UNIVERSITY BUSINESS SCHOOL**

**E-LEARNING ADAPTABILITY, LEARNING ENVIRONMENT AND STUDENTS'**

**LEARNING PRODUCTIVITY IN SELECTED UNIVERSITIES**

**BY**

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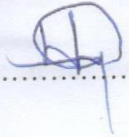
## DECLARATION

I, Kuteesa Christine declare that this dissertation is my own piece of work. Any assistance that I have received has been duly acknowledged in this dissertation. It is submitted in partial fulfilment of the requirements for the degree of Master of Science in Accounting and Finance from Makerere University. It has not been submitted before for any degree or examination at any institution of Higher Learning.

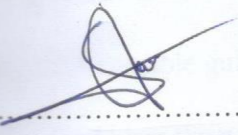
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## APPROVAL

This is to certify that this dissertation was completed under the supervision of the university assigned academic supervisors.

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## **DEDICATION**

I would like to dedicate my work to Eng. Joseph Ssebuli Musoke. He instilled in me a desire to learn and made sacrifices so I would have access to high quality education from an early age. Also, this is dedicated to my Mother who has always supported me throughout my years of studies.

Thank you for making me see this adventure through to the end.

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## ABSTRACT

The purpose of this research is to investigate the influence of e-learning adaptability and learning environment to students' learning productivity in universities. The research problem was that in Uganda the productivity of students has reduced more especially in the Covid 19 pandemic period. This is more evident with the students of Master of Science in Accounting and Finance. Hence the research objectives were: to examine the influence of E-learning adaptability on students' learning productivity, to examine the influence of learning environment on students' learning productivity and to examine the mediating effect of learning environment in the relationship between E-learning adaptability and students' learning productivity.

The researcher used a cross-sectional quantitative survey design. The total population was 109 students from which a sample of 85 students was used. They were selected by simple random sampling. A questionnaire was used to collect data. The correlation results indicate that e-learning and students' learning productivity are significantly correlated ( $r = .827^*$ ,  $p < .01$ ), learning environment and students' learning productivity are significantly correlated ( $r = .863^*$ ,  $p < .01$ ). The results also show that the independent variables can predict 78.2 percent of the variance in student's learning productivity (Adjusted R Square = .782). More to that, learning environment significantly though partially mediates in the relationship between E-learning adaptability and students' learning productivity. On that basis it was recommended that educational institutions and stakeholders should prioritize creating adaptive and supportive learning environments, investing in technological infrastructure, and psychological well-being, continuously evaluating and improving E-learning platforms, providing comprehensive training and support for e-learning tools, and offering diverse learning materials and tools to cater to the various needs and preferences of students, thereby enhancing overall learning productivity.

## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background

Today's university students come from increasingly diverse backgrounds, more are adult learners with specific and diverse goals (Apple, 2020). As students change in these ways, the nation desperately needs educated citizens who possess not just technical skills but also analytical and evaluative skills, integrity, values, creativity, the ability to work with others from diverse backgrounds, flexibility, and openness to change according to the needs of education (Dhaliwa et al., 2017). Ogrenci et al (2016) indicated that stakeholders are demanding that educational institutions demonstrate outcomes. Meanwhile, resources for higher education are increasingly limited. When scarce resources must be used for higher outcomes, the issue is students' learning productivity that is, the ratio of input to output. Munung (2014) argued that student learning productivity is through input and output, where input is students' time invested in lectures, research, group work, learning, and participation in class, and where output comes from the knowledge that the student has acquired as a result, measured by the grades of the examination or study performance. Students' learning productivity research originally aimed to identify the most effective allocation of resources in schools (Federici and Caffentzis, 2019). Because there is a huge gap in average educational inputs between developed and developing countries, it is quite understandable that many studies report the difference in the effects of school inputs on educational achievement in universities (Veron, 2021). Educational productivity research has been a powerful tool to determine what affects students' academic achievement and to suggest effective educational investment for policy makers in both developed and developing countries.

Wamala (2019) indicated that in Uganda, students' learning productivity has been a question of discussion especially with the emergency of Covid-19 pandemic. With students staying at home for two years when and others shifting to online classes, productivity issues of students is said to have reduced. Kiwuwa (2019) indicated that even some universities went ahead to administer both coursework and final exams online. With this, students' learning productivity has greatly reduced as indicated by the poor performance in the exams (Kinengweri, 2020). Many students have attributed their poor productivity to failure to understand online lectures which they characterize of poor networks and unreliable online systems. In Uganda, there is increase pressure for productivity among students. This pressure for increased productivity in higher education is the result of several forces: increased student demand for college educations and increased educational requirements for some jobs.

There have been studies which have related learning environment to students' productivity. Fox (2015) indicated that students who learn from conducive environment are likely to increase their productivity. His research was based on developed countries. Eurodad, (2016) argued that students in developed countries have access to better learning environment which makes it easy for them to learn comfortably. This makes them more productive in the education.

E- Learning adaptability in different university has been affected by different factors (Bloom Rosoosky, 2019). Factors like E-learning orientation, availability of E-learning facilities and access to e- learning facilities have played a greater role in students, adaptability to E-learning Ameri, (2017). The learning productivity of university students through E-learning and learning environments can be considered a surrogate measure of universities' ability to prepare the next generation of all students. Imparting different skills is a key aspect of training students in different aspects of life, but also equipping students with the knowledge and skills to critically appraise evidence before applying it. Studies by Dreher, (2004) and Clark, (2014)

have shown that students' learning productivity increases with an increase in E-learning adaptability

Much research on education productivity in Uganda has focused on targeted audiences like children and young adolescents, but also important actors within the education system like teachers and administrators. Other research focuses on structures that appear to mediate the educational system supervisory unions and the resources expended in these systems. This has rendered a dearth of research on students' learning productivity in Universities in Uganda hence the call for this study.

### **1.1 Problem Statement**

Being productive' or 'being efficient' is a vital aspect of a student's being. It means that students have to be the most efficient if they wish to reach their goals. If students' learning is productive, then they are efficient enough to meet the challenges and tasks that are needed to achieve their goals and aspirations. Quality education is one that provides all learners with capabilities they require to become economically productive, develop sustainable livelihoods, contribute to peaceful and democratic societies and enhance individual well-being. However, in Uganda the learning productivity of students has reduced more especially in the Covid 19 pandemic period. This is more evident with the students of Master of Science in Accounting and Finance. Wamala, (2019) indicated that there have been cases of students failing exams in unprecedented manner, failure to understand the lecturers by the students and failure to apply what is being taught to them. This trend has grown from 13% in 2019 to 21% in 2020 and then to 24% in 2021. Kiwuwa, (2019) indicated that the job market is complaining about the quality of the students especially those who completed their studies during the Pandemic. Despite of the efforts created like introducing guest lectures, taking students for workshops and seminars, introducing both online and physical classes and prolonging the semester durations in some

universities, the problem has persisted. It is not clear if the problem is as a result of failure to adopt to technology or failure to adopt to E-learning methods.

## **1.2 Purpose of the Study**

The purpose of this research is to investigate the influence of e-learning adaptability and learning environment to students' learning productivity in universities.

## **1.3 Objectives of the study**

- i. To examine the influence of E-learning adaptability on students' learning productivity.
- ii. To examine the influence of learning environment on students' learning productivity.
- iii. To examine the mediating effect of learning environment in the relationship between E-learning adaptability and students' learning productivity.

## **1.4 Research questions**

- i. What is the influence of E-learning adaptability on students' learning productivity?
- ii. What is the influence of learning environment on students' learning productivity?
- iii. What is the mediating role of learning environment in the relationship between E-learning adaptability and students' learning productivity?

## **1.5 Scope of the study**

### **1.5.1 Time scope**

This study was carried out between April 2022 and May 2023.

### **1.5.2. Geographical scope of the study**

The study was carried out at selected universities in Uganda and these include Makerere University Business School, Ndejje University and Nkumba University in Kampala. The reason for selecting these universities is because they are the only universities in Uganda that have a Master of Science in Accounting and Finance.

### **1.5.3. Subject scope**

The subject scope of this study includes the E-learning adaptability, technological adoption and students' learning productivity. It also looks at the interrelationship between the variables, if any.

### **1.6 Significance of the Study**

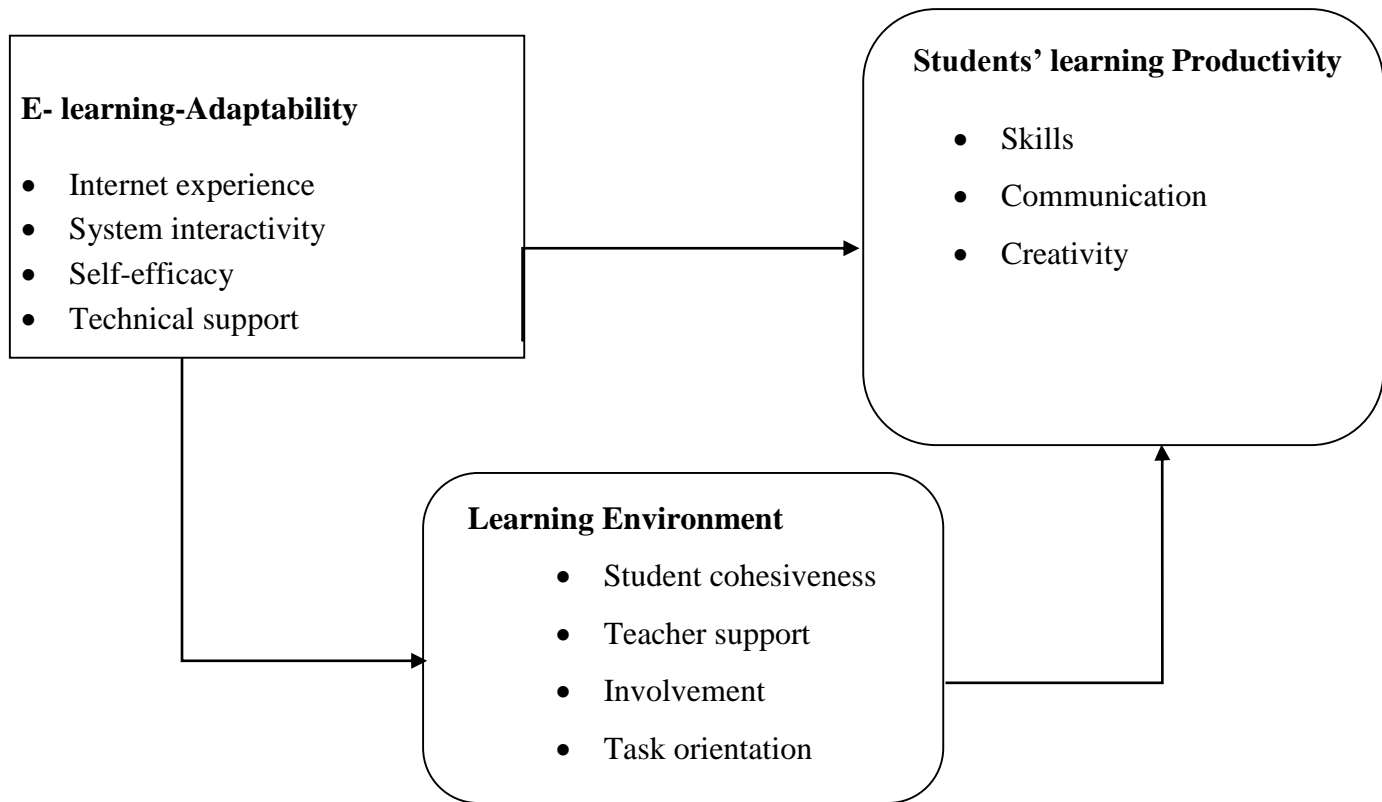
The study may contribute to the body of knowledge. It may be useful to future and current academicians who would opt to carry out research concerning students' learning productivity especially in Uganda.

The study may adopt a cross sectional quantitative research design. This means that it will create a room for using primary data to come up with correlation and regression results. This will help to determine if there is a relationship between the variables and also determine if the two independent variables can predict the dependent variable. Selecting the students' leaders will provide the researcher with reliable information since these leaders represent students' challenges to different offices.

The study will also be relevant to policy makers in the education sector to identify which policies would be relevant in regards to E-learning adaptability by the students and technology adoption all of which are intended to enhance students' learning productivity in higher institutions of learning.

The study will also be relevant to higher institutions of learning in coming up with the best approaches on how they can enhance the productivity of students through encouraging E-learning and technology adoption.

## 1.6 Conceptual framework/Model



*Adapted from Herbert (1998), Andrew et al (2021) and Rhiannon (2019) with modifications from the researcher*

## 1.7 Explanation of the conceptual framework

The conceptual model depicts that students' learning productivity is dependent on E-learning adaptability and learning environment. The model also depicts that learning environment can play a mediation role between E-learning adaptability and students' learning productivity. This model is self-developed from reviewing existing literature on the variables under the study.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Students' learning productivity

Dos (2021) argued that change from face-to-face to online mode of lectures due to the Covid-19 pandemic affected greatly the day-to-day life of students in different Universities. Learning productivity is defined as the combination of student engagement in educationally purposeful activities and the gains they make in a range of desired outcomes (Mosen, 2021). Learning productivity also defined through input and output, where input is students' time invested in lectures, research, group work, learning, and participation in class, and where output comes from the knowledge that the student has acquired as a result, most times measured by the grades of the examination or study performance (Driscoll, 2015) Bergamin et al., (2012) defined learning productivity as a measure of how well resources are utilized to produce output for students. It is defined as a ratio of outputs to inputs (Asiimwe et al., 2017). Then managing students' learning productivity is to achieve more outputs for the same inputs, usually measured in terms of what a student gets from what he learns (Balaji and Chakrabarti, 2010). The modern notion of productivity includes both students' efficiency and effectiveness in acquiring knowledge. In education outputs are principally represented by teaching, outcomes by learning (Anderson et al 2001). Lai (2013) argued that the definition of productivity should not be confused with efficiency and effectiveness. He argued that effectiveness is a measure of the outcome of an operational unit like a school or a university department. It is a measure of how well an operational unit is able to accomplish its objective. Efficiency is a measure of the degree to which an operational unit utilizes appropriate resources in the right manner (Males et al., 2017).

Badru, (2019) indicated that education is an area of public service that is encountering increasing scrutiny and criticism for its low quality and productivity. Educators are being called on to function in an effective and efficient manner to increase students' learning productivity (Navaridas et al., 2013). In addition, they are expected to adopt policies and methods that will permit even greater productivity in students. Noe, (2017) indicated that the subject of productivity often evokes emotional, polarized reactions from different stakeholders of a university. Yet much more is said about productivity than is known on the basis of sound research and theory. Frequently, scholars and practitioners alike refer to "productivity" and "quality" as if they were two separate performance measures. Yet a significant part of any students' learning productivity equation is quality (Olasina, 2018).

## **2.2 E -learning Adaptability**

Okeleke et al (2017) defined E-learning adaptability as the way students get used to acquiring knowledge through technologies rather than being physically in class. Miller and Falloon (2010) described E-learning adaptability as the process through which students go through to master the art of learning through technologies. Bloom and Rosoysky (2019) argued that E-Learning adaptability in different university has been affected by different factors. These factors have greatly affected students' learning productivity in different ways. Factors like E-learning orientation, availability of E-learning facilities and access to e- learning facilities have played a greater role in students, adaptability to E-leaning Ameri, (2017). Imparting different skills is a key aspect of training students in different aspects of life, but also to equip students with the knowledge and skills to critically appraise evidence before applying it. Studies by Dreher, (2004) and Clark, (2014) have shown that students' learning productivity increases with an increase in E-learning adaptability.

One of the most pronounced trends in higher education over the last decade has been a strong growth in distance education through online learning (Rossette and Haila, 2016). While the rise

of online distance education has expanded learning opportunities for all students, it is often most attractive to nontraditional students, who are more likely to have employment and family obligations that make attending traditional face-to-face classes difficult (Aslanian, 2001). Perhaps as a consequence, e-learning enrollments have increased particularly quickly at universities especially with the error of Covid-19. (Choy, 2002; Parsad & Lewis, 2008), However, given that most university students received their primary and secondary education in a face-to-face setting, adapting to e-learning may represent an adaptation challenge for many (Moore et al., 2011). Little (2012) argued that in an attempt to understand how readily students adapt to e-learning that is, the extent to which students perform as well online as they do face-to-face, a large body of research has compared outcomes between online and face-to-face learning. Results have been mixed across studies, with some finding positive effects for online learning and others finding negative results (Bernard et al., 2004; Zhao, Lei, Yan, Lai, & Tan, 2005; Sitzmann, Kraiger, Stewart, & Wisher, 2006; Jahng, Krug, & Zhang, 2007; U.S. Department of Education, 2010).

Lowenthal, (2016) indicated that regardless of students' own characteristics, their adaptability to e-learning may also differ by academic subject, as online courses might be more engaging or effective in some subject areas than in others. Liu et al (2003) argued that for instance, it may be more difficult to create effective online materials, activities, or assignments in fields that require a high degree of hands-on demonstration and practice, intensive instructor-student interaction, or immediate personalized feedback. In support of the notion that the effectiveness of e-learning may differ across subject areas. Jaggars, (2012) examined course subjects that students preferred to take online rather than face-to-face. Students reported that they preferred to take "difficult" courses (with mathematics being a frequently cited example) in a face-to-face setting, while "easy" courses could be taken online. Students also explicitly identified

some subject areas that they felt were “poorly suited to the online context such as laboratory science courses and foreign languages.

### **2.3 Learning environment**

Faizi (2018) defined learning environment refers to the diverse physical locations, contexts, and **cultures** in which students learn. A ‘learning environment’ is the learning culture as well as the physical surroundings created by teachers, students and other stakeholders (El-Hussein & Cronje, 2010). It can be in the school building(s) but also outdoors, online, and away from school. Since students may learn in a wide variety of settings, such as outside-of-school locations and outdoor environments, the term is often used as a more accurate or preferred alternative to classroom, which has more limited and traditional connotations a room with rows of desks and a chalkboard or white board (Basri et al., 2018)

According to Study.com (2018) learning environment encompasses learning resources and technology, means of teaching, modes of learning, and connections to societal and global contexts. The term also includes human behavioral and cultural dimensions, including the vital role of emotion in learning. The learning environment is a composite of human practices and material systems, much as ecology is the combination of living things and physical environment (Balog, 2018). Contemporary learners deserve learning spaces that meet their individual and collective needs. To meet this challenge, educational leaders must provide physical and cultural environments that are empowering and engaging (Orlu, 2013). Learning environments vary from classroom to classroom and context to context each with unique elements. According to study.com (2018) learning environments can be learner-centered; knowledge - centered; assessment - centered; and community - centered. Learner-centered environments are designed for the active construction of knowledge by and for learners (Federation University, 2018). Knowledge-centered learning environments are those which support students' deep investigations of big ideas through generative learning activities.

According to Basri et al (2018), learning environment also encompasses the culture of a school or class, its presiding ethos and characteristics, including how individuals interact with and treat one another as well as the ways in which teachers may organize an educational setting to facilitate learning for example by conducting classes in relevant natural ecosystems, grouping desks in specific ways, decorating the walls with learning materials, or utilizing audio, visual, and digital technologies. Butt and Qaisar (2017) argued that because the qualities and characteristics of a learning environment are determined by a wide variety of factors, school policies, governance structures, and other features may also be considered elements of a “learning environment.”

Educators may also argue that learning environments have both a direct and indirect influence on student learning, including their engagement in what is being taught, their motivation to learn, and their sense of well-being, belonging, and personal safety (Carlson, 2000). For example, learning environments filled with sunlight and stimulating educational materials would likely be considered more conducive to learning than drab spaces without windows or decorations, as would schools with fewer incidences of misbehavior, disorder, bullying, and illegal activity (Arpaci, 2015). How adults interact with students and how students interact with one another may also be considered aspects of a learning environment, and phrases such as “positive learning environment” or “negative learning environment” are commonly used in reference to the social and emotional dimensions of a school or class (Ahmed & Parsons, 2013).

## **2.4 Empirical Review**

### **2.4.1 Relationship between e-learning adaptability and students’ learning productivity.**

Education is thought to be most crucial foundation of a growing economy, yet the academic system needs radical transformations and major technological reforms. E- learning, a more pronounced form of education, is emerging as a stepping stone towards bringing revolution to

the educational sector and providing hands on solutions to the pertaining problems (West, 2013). In contemporary education management, students tend to greatly rely upon technologies to achieve dramatic performance outcomes academically. With intense inclination towards cellular connectivity, e-learning adaptability is playing critical role in improving learning of the students as well as instructors. Digitized technology has put way forward to enable access to information and delivery of latest learning content regardless of student's availability (Jacobs, 2013). One of the remarkable consequences of e-learning adaptability is that it engages, empowers and supports learning in such a manner that radically transforms knowledge seeking mechanism for students (Ismail & Ford, 2019).

In previous years, technology has been majorly used for purpose of communication, now the trend has shifted towards using them for gaining and sharing information. People are utilizing technology as means of fundamental didactic channel in academic establishments (El-Hussein & Cronje, 2010). Furthermore, the count of users for this purpose is consistently rising, this can be judged through the given statistics especially during the Covid-19 period. E-learning has become remarkably convenient for students and teachers to beat the problems of leaning and instructing at any time and place and increasing their productivity. It would not be overestimating to say that e-learning adaptability has been extensively embraced by students and teachers due to its working, standards and philosophy that increase students' learning productivity (Huang & Hsieh, 2012). Technology has been deeply rooted in education for more than two decades; however, technological revolution through portable gadgets such as mobile phones which can easily enable e-learning possible has brought changes radically (Valk, Rashid, & Elder, 2010). E-learning has changed the way students seek knowledge and develop cognition which has also influenced their productivity. Thus, e-learning adaptability facilitated by access to academic resources, socializing with each within and outside the physical boundaries and sharing experiences, helps to back the learning objectives of individuals as well

as institutions which improves students' learning productivity academically (Farid, Ahmad, Niaz, Arif, Shamshirband, & Khattak, 2015).

Sung and Mayer (2013) found out a significant positive effect on thee-learning and students productivity Students' inspiration towards using e-learning is positively associated with improved students' learning productivity in Chinese Universities. Although, some research found a negative impact of e-learning in students' learning productivity (Sung & Mayer, 2013; Froese, Carpenter, Inman, Schooley, Barnes, Brecht, & Chacon, 2012).

E-learning provides flexibility for accessing learning content for enlightening learning accomplishment (Olasina, 2018). E-Learning equips students with the choice to learn at their personalized place, pace and using convenient learning approach. Students in less industrialized nations do not realize the actual potential of using flexible pedagogical academic tools through e-learning (Gordon, 2014). E-learning lets students decide about where, what and how to learn, thus managing the bulky inflow of knowledge effectively through acquired flexibility.

#### **2.4.2 Relationship between learning environment and students' learning productivity.**

Learning environment is composed of some components that influence the student's learning curve. These components according to Balog (2018) include; people; teaching materials, technical tools, and learning resources; curriculum, training, and instruction, and physical environment

Waldman, (2016) observed that before students can be productive academically, they must feel safe, both physically and mentally, and to have a safe learning environment, students must feel welcomed, supported, and respected. Personalizing learning helps students develop skills including thinking critically, using knowledge and information to solve complex problems, working collaboratively, communicating effectively, learning how to learn, and developing

academic mindsets that would greatly increase students' learning productivity (Raccoon, 2018). More so, students must feel connected to teachers, staff, and other students. Schools can nurture these connections by focusing on students' social and emotional learning (SEL). Students must also feel supported by all those connected to their learning experience like teachers, classmates, administrators, family, and community members for higher productivity (Waldman, 2016) Productive learning environments are crucial to students' academic, emotional and social success in school. A conducive learning environment doesn't just happen on its own or by chance. It should be created by both the students and the school including the teachers (Becton, 2017).

Shamaki, (2015) conducted a study to determine the influence of learning environment on students' learning productivity at senior secondary school level in Yobe state, Nigeria and found a significant difference between the mean performance of students taught in an ideal learning environment and that of students taught in a dull learning environment. Adamu, (2015) examined the impact of learning environment on the productivity of Students in public secondary schools in Taraba State, Nigeria and the findings revealed a significant difference in the performances of the two groups (Experimental and Control) implying that a classroom building; class with adequate furniture; class with small class population and the use of instructional materials has positive impact on the students 'productivity in junior Secondary schools. In a related development, Mudassir and Norsuhaily, (2015) conducted a study to examine how school environment influence students' academic performance in selected secondary schools within developing countries. The result of the study indicated that students from a school with adequate facilities, good teachers and favorable environment perform better than those from schools with fewer facilities, unqualified teachers and less enabling environment. In another research by Duruji, Azuh and Oviasogie, (2014), which examines the impact of learning environment on students' learning productivity in external examination in



secondary schools in Ota, Nigeria considering factors such as school facilities, class size, school location and school plant planning, aesthetics, maintenance culture, sanitation, conveniences. The study established that” the state of learning environment and quality of infrastructure, together with the extent to which they are being maintained has a strong bearing to academic performance among students’;

#### **2.4.3 The mediating role of learning environment in the relationship between e-learning adaptability and students’ learning productivity.**

There is scarce literature which relates learning environment, e-learning adaptability and students’ productivity. Most of the literature relates either of the two variables.

Research has found that learning environments play a crucial role in student productivity (Alalwan et al 2013; Cho et al 2018; Crompton 2013 and Emerson and Berge 2018). Several factors can affect learning productivity, including seating, light, noise, and even color. Students who study in a positive learning environment have been shown to be more productive, engaged, and have a higher overall learning ability. Gorham (2010) indicated that students learning in the environment that is poor, uncomfortable, loud, or full of distractions have found more difficult to absorb information and stay productive.

Gordon (2010) indicated that e-learning also has a learning environment. The study indicates the place and the facilities which are used to facilitate the e-learning process. Gupta and Koo (2012) indicated that the questions to look at are; where are the students learning from via the internet? Is it at home, school, at work or there are special designated areas for learning? What IT facilities are the students using to access the E-learning programmes. Are they using computers, phones or any other computerized gadget? How efficient are the gadgets that the students use to access the e-learning programmes and how affordable are they? The comfort, the lighting, color, noise and the clutter all affect e-learning adaptability as well as students’

productivity. Jacobs (2013) indicated different ways of adapting to e- learning staying organized. Online learning gives you more flexibility but can also make it more difficult to dedicate time to studying, optimize your learning environment, adapt your learning habits, connecting with others in the same programme and staying positive and informed about the e-learning programmes Jakobsen & Jensen (2015).

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1. Introduction**

This chapter addresses how the study was undertaken. It includes the design of the study, population, sample size, sampling procedure, data collection instruments, measurement of the variables, ethical considerations, reliability and validity, units of inquiry and analysis, as well as the data collection sources and activities.

#### **3.2 Research Design**

The researcher used a cross-sectional survey design. This emphasized a quantitative research approach. A cross-sectional design is utilized for its ability to provide a snapshot of the variables of interest at a specific point in time, allowing for a robust statistical analysis that can identify and explore correlations, patterns, and relationships within a defined population, thereby facilitating a comprehensive understanding of the phenomena under investigation.

The study was quantitative in nature because quantitative research allows a broader study involving a greater number of subjects. The design provided summaries of data that support generalizations about the phenomenon under the study (Scarte, 2018).

#### **3.3 Total Population**

The total population was 109 students who are doing Master of Science in Accounting and Finance in three universities of Makerere University Business School, Ndejje University and Nkumba University. The choice of the population is in line with Sehrish, (2020) and Kashan (2022). The unit of inquiry for this study were university students. This is because, the researcher is interested in investigating how their productivity is affected especially during the introduction of E-learning and the environment that they are learning in the unit of inquiry for

this study were those pursuing the Master of Science in Accounting and Finance from the selected universities. This is because in these universities, there has been adoption of e-learning since Covid 19 in 2020 and the chosen group is part of those that are affected. This gives them a high chance of having the necessary information about student's productivity in line with E-learning productivity and the learning environment. Secondly, students of accounting and finance can easily be accessed since they are few compared to the whole number of Students at these universities. The list of these students was provided by respective academic registrars.

<b>University</b>	<b>Population</b>
Makerere University Business school	44
Ndejje University	36
Nkumba University	30

### **3.4 Sample Size**

Basing on a population of 110, a sample size of 85 students was used in this study. The sample size translates to 72 percent of the total population. The sample was determined using the proportionate sampling method, where the proportion of the student in each university is multiplied by the targeted total sample size to determine how many students were sampled in each university.

<b>University</b>	<b>Population</b>	<b>Sample size</b>
Makerere University Business School	44	34
Ndejje University	36	28
Nkumba University	30	23
<b>Total</b>	<b>110</b>	<b>85</b>

Having used the proportionate method to determine the number of students to select at each university, a simple random sampling method was used to select students at each stratum. A

simple random sampling method is a scheme where all the elements have equal chances of being selected in a given population (Roder, 2029).

### **3.4.1 Response Rate**

Response rate in research refers to the proportion of participants who complete and return the survey or questionnaire in relation to the total number of individuals who were invited to participate. It is usually expressed as a percentage. A high response rate is often seen as an indicator of the quality of the data, as it suggests that the sample is more likely to be representative of the population under study. The study targeted 85 students in the selected universities. However, not all the respondents returned the questionnaires in time. Consequently, information was obtained from only 73 respondents. This gave a response rate of 85.9%, which is considered sufficient for this study as indicated by Mugenda and Mugenda, (2003).

### **3.5 Sampling Design**

A simple random sampling method was used to select the sample from within the population of students doing the Master of Science in Accounting and Finance of the selected universities, to participate in this research. A simple random sampling method is a scheme where all elements have equal chances of being selected from a given population. This involved listing down the names of all the students' representatives at the university and putting them in the bucket. The researcher started to pick one name by one without replacement until the sample size was reached. This technique gives equal chances to all members to be selected in the sample and it avoids bias.

### **3.6 Data Collection Instruments**

Structured questionnaire were used to collect data. The questionnaire was self-administered.

The research will have some time off her work and deliver these questionnaires to student's leaders.

It consisted of closed ended questions that will seek information on student productivity, learning environment and E-learning adaptability. The questionnaire was comprised of four sections. Section A, B, C and D. Section A was comprised of one part. This part comprised the profile of the respondents Section B comprised the questions on the measurements of Student productivity. Section C was comprised of the questions on the measurements of learning environment. Section D was comprised of the questions on the measurements of E-learning adaptability.

Questionnaires were preferred for this study because; it is generally relatively quick to collect information using a questionnaire and also potential information can be collected from a large portion of a group. Further, the return rates can be dramatically improved if the questionnaire is delivered and responded to in the right time.

### 3.7 Measurement of the Variables

Variable	Definition	Measures	Source
Students' learning productivity	The efficiency and effectiveness with which students achieve their educational goals, often measured by the quality and quantity of their academic output within a given time frame.	Skills Communication Creativity	Herbert (1998)
E-learning productivity	E-learning productivity refers to the efficiency and effectiveness with which learners acquire knowledge and skills through electronic technologies, often characterized by the quality and	Internet experience systems interactivity self-efficacy technical support	Andrew et al (2021)

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	quantity of educational accomplishments achieved via online platforms.		
Learning environment	Learning environment denotes the diverse physical or virtual settings, along with the cultural and psychological factors, that facilitate or hinder the learning process, encompassing aspects such as classroom layout, technology, social interactions, and organizational culture.	Cohesiveness teacher support involvement task orientation	Rhiannon Giles (2019)

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Multiple-item scale was used to measure each construct. A self-administered questionnaire was provided to the respondents to select a suitable response. Responses were anchored on a 5-point Likert scale ranging from “1= Strongly Disagree (SD) to 5= Strongly Agree (SA)”. A five-point Likert scale was used to increase response rate and response quality.

### 3.8 Reliability and Validity

Reliability is the consistency of a research study. If the findings from the research are replicated consistently, they are reliable. A cutoff Cronbach’s alpha of 0.7 and above was used to assess the degree of reliability of the results. Results for reliability are shown in the table 4 below:

*Table 4: Cronbach Alpha Reliability Results*

<b>Variable</b>	<b>No of Items</b>	<b>Alpha reliability Score</b>
E-learning adaptability	15	0.919
Learning environment	15	0.929
Students learning productivity	15	0.934

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Source: primary data

As is evident in table 4 above and since all Alpha scores were above the threshold of 0.7, one can conclude that the results from the tool were reliable.

This measures the accuracy of the questionnaire by taking into account what it is intended to measure (Maxwell, 2009). To ensure validity, the questionnaire was subjected to a content validity index where five experts were requested to rate the relevance of the questions set against the study variables using the scale of relevant and not relevant. The results for CVI are shown in table 5 below:

*Table 5: Content Validity Index (CVI Results)*

<b>Expert</b>	<b>CVI Score</b>
Expert 1	0.754
Expert 2	0.811
Expert 3	0.708
Expert 4	0.824

Source: primary data

As seen in the table above, the results for CVI were above 0.5 which indicates validity of items in the questionnaire.

### **3.9 Data Collection Sources and Activities**

Primary data was obtained in the study. Mosia (2019) defined a primary data source as anything that gives a researcher direct and firsthand evidence on a phenomenon about the research. Primary data was obtained through self-administered questionnaires. Students of the selected



universities provided this research with primary data. These provided information about the variables under the study.

Questionnaires were self-administered. They were given to students and a follow up was done for those students who were unable to fill it on real time. The researcher did not use research assistants since she had some time off work to do the follow up.

### **3.10 Data Processing, Analysis and Presentation**

Editing and coding of data was done by entering data into the analysis software after questionnaires were all collected. Descriptive, correlation and regression data was analyzed and presented using statistical package for social scientists (SPSS). The researcher used quantitative data analysis to establish the relationship between the variables. Soshi (2018) defined data analysis as the process through which data used to discover useful information for decision making is cleaned, transformed, and modeled.

The purpose of data analysis was to extract useful information from the data and taking the decision based upon the data analysis. The data analysis process went through the following steps: data validation, this includes screening the data, completeness, reliability and validity of the data collected. Step two was data editing. This step was all about checking for errors especially those from the respondents. Stage three is data coding. This stage was concerned with grouping and assigning values to responses from the survey (Dacks, 2014).

### **3.11 Ethical Considerations**

The researcher got an introductory letter from the various universities that was presented to the respondents at the selected universities. The researcher fought for permission from MUBS, UCU and Kyambogo University administrators before administering the questionnaires to the students. The respondents were assured of anonymity. The questionnaires were structured in a way that they don't disclose neither the organization's name nor the respondent's name. This

helped ensure anonymity. If the questionnaires are returned, data was extracted from them and kept in a closed drawer for two years and then destroyed after. This ensured confidentiality.

## CHAPTER FOUR

### ANALYSIS, PRESENTATION AND INTERPRETATION OF THE RESULTS

#### 4.0 Introduction

This chapter covers the presentation, analysis and interpretation of the results according to the objectives of the study specified in the first chapter. The objectives were:

- i. To examine the influence of E-learning adaptability on students' learning productivity
- ii. To examine the influence of learning environment on students' learning productivity
- iii. To examine the mediating effect of learning environment in the relationship between E-learning adaptability and students' productivity

#### 4.1 Background information

##### 4.1.1 Background information on the respondents

The background information on the respondents is shown in table 6 below:

**Table 6**

*Sample Characteristics (N=73)*

<b>Parameter</b>	<b>Frequency</b>	<b>%</b>
<b>Gender</b>		
Male	42	57.5
Female	31	42.5
<b>Age</b>		
21-25 years	15	20.5
More than 25 years	58	79.5
<b>Marital Status</b>		
Single	27	37.0

Married	46	63.0
<b>How long they have been in the institution</b>		
Less than a year	25	34.2
1-3 years	29	39.7
More than 3 years	19	26.0

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*Source: primary data*

**Gender:** The results in table 6 show that in the sample of respondents from selected universities in Uganda, there are more male students (57.5%) compared to female students (42.5%). This implies that there might be a gender disparity in the enrollment of students in these institutions. That notwithstanding, the results show that students from both genders were represented in this study on their productivity.

**Age:** results show that the majority of the respondents fall within the age bracket of more than 25 years (79.5%), while 20.5% are aged 21-25 years. This distribution reflects that most of the respondents are in their adulthood. This is a crucial age range as it is a period where individuals have already set their learning habits and academic foundation. For this study it implied that the data was obtained from students of varying ages which further enriched the study with perspectives from diverse students by age.

**Marital Status:** The data reveals that 63.0% of the respondents are married, and 37.0% are single. Marital status can have a substantial impact on students' learning productivity as married students might have more responsibilities, such as family commitments, which can influence the time and effort they can devote to their studies. The implication here is that the data was got from mainly married students though those who are single were also represented.

**Duration in the Institution:** from table 6 we see that the students who have been in the institution for less than a year constitute 34.2% of the sample, 1-3 years make up 39.7%, and those with more than 3 years constitute 26.0%. This parameter is essential in understanding the

familiarity and adaptation to the institutional environment and e-learning systems. Students who have spent more time in the institution might be more accustomed to the learning environment and have developed strategies to be productive. Newer students, on the other hand, might still be in the phase of adapting. It's also possible that those who have been in the institution longer might have witnessed transitions in learning methods, and their adaptability to changes, especially in e-learning, could be an essential aspect to explore in understanding their learning productivity.

### **4.3 Pearson's Correlation Coefficients**

The objectives of the study concerned relationships between the variables. In order to achieve this, the Pearson ( $r$ ) correlation coefficient was computed given the interval nature of the data and the need to test the direction and strength of this relationship. The table7 below shows the Pearson's Correlation Coefficient for the Variables under study.

**Table 7***Showing Pearson Correlation Results (N=73)*

<b>Variable/Indicator</b>	1	2	3	4	5	6	7	8	9
1. Technical Support	1								
2. Internet Experience	.613**	1							
3. System Interactivity	.747**	.524**	1						
<b>4. E-learning Adaptability</b>	<b>.920**</b>	<b>.816**</b>	<b>.886**</b>	<b>1</b>					
5. Student Cohesiveness	.611**	.449**	.533**	.611**	1				
6. Teacher Support	.782**	.688**	.690**	.835**	.539**	1			
7. Involvement	.590**	.533**	.566**	.665**	.565**	.632**	1		
<b>8. Learning Environment</b>	<b>.783**</b>	<b>.660**</b>	<b>.703**</b>	<b>.830**</b>	<b>.847**</b>	<b>.850**</b>	<b>.845**</b>	<b>1</b>	
<b>9. Students Learning Productivity</b>	<b>.765**</b>	<b>.635**</b>	<b>.731**</b>	<b>.827**</b>	<b>.584**</b>	<b>.852**</b>	<b>.765**</b>	<b>.863**</b>	<b>1</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Source: primary data*

The study had two independent variables and one dependent variable. These results in table 7 are interpreted in the subsections that follow, according to the stated objectives of the study:

#### **4.3.1 The relationship between e- learning adaptability on students' learning productivity**

The first objective of the study was to examine the influence of e-learning adaptability on students' learning productivity. The correlation results in Table 7 indicate that e-learning and students' learning productivity are significantly correlated ( $r = .827^*$ ,  $p < .01$ ).

This means that changes in e-learning adaptability are associated with changes in student's learning productivity. This applies to both positive and negative changes. Where there is technical support, better internet experience and greater system interactivity then productivity of students is expected to improve. Further implication of these results is that when e-learning adaptability improves then the student's productivity is more likely to be better as anticipated.

#### **4.3.2 The relationship between learning environment on students' learning productivity**

The first objective of the study was to examine the influence of learning environment on students' productivity. The correlation results in Table 7 indicate that learning environment and students' learning productivity are significantly correlated ( $r = .863^*$ ,  $p < .01$ ).

This means that changes in learning environment are associated with changes in student's learning productivity. This applies to both positive and negative changes. Where there is better cohesiveness among the students, greater teacher support and more involvement, then we can expect the productivity of students to improve. Further implication of these results is that when learning environment improves then the student's productivity is more likely to be better as anticipated.

#### **4.4 Regression Results**

In order to ascertain the degree to which the independent variables predict the dependent variable, a regression analysis was done. Table 8 shows the results of the regression analysis.

**Table 8***Regression Coefficients (N=73)*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	.351	.219		1.602	.114
	E-Learning Adaptability	.347	.088	.377	3.923	.000
	Learning Environment	.564	.098	.554	5.767	.000

R=.888, R Square=.789, Adjusted R Square=.782, Std Error of the Estimate=.41007

a. Dependent Variable: Students Productivity

Source: primary data

The study sought to ascertain the predictive potential of each of the two independent variables on the dependent variable. The results in the Table 8 further show that e-learning adaptability ( $\beta = 0.377$ ,  $p < .01$ ) is a significant predictor. Learning environment on the other hand also is a significant predictor ( $\beta = 0.554$ ,  $p < .01$ ).

The results in the regression model show that all two independent variables can predict 78.2 percent of the variance in student's productivity (Adjusted R Square = .782). The remaining 21.8 percent is predicted by other factors which have not been considered in this study.

#### 4.5 Mediation Analysis

Mediation analysis is a statistical method used to identify and explain the process that underlies an observed relationship between an independent variable and a dependent variable via the inclusion of a third variable known as the mediator. The Mediation analysis was performed by employing methodologies that hinge on regression analysis, as articulated by Kumari & Yadav in their 2018 study. Essentially, mediators are instrumental in elucidating the mechanics and rationale behind the functioning of certain variables. They act as bridging elements that clarify the nexus between



a predictor variable (independent variable) and a criterion variable (dependent variable) by intervening in the causal pathway.

For the mediation effect to be substantiated, the analysis must satisfy the following sequential conditions:

In the preliminary regression equation, it is imperative that the independent variable exerts a statistically significant impact on the dependent variable. This forms the basis for establishing that a relationship exists that warrants further exploration for potential mediation.

Subsequently, in the second regression equation, the independent variable must also manifest a significant influence on the mediator. This ensures that the mediator is, in fact, associated with the predictor and can act as an intervening variable.

In the final regression equation, the mediator must have a significant effect on the dependent variable when both the independent variable and mediator are introduced as predictors. This is pivotal in ascertaining that the mediator plays a meaningful role in the relationship between the predictor and criterion variable.

If these conditions are met and the independent variable ceases to have any significant effect on the dependent variable once the mediator is controlled for, it can be concluded that full mediation is at play. This implies that the mediator accounts for the entire relationship between the independent and dependent variables.

On the other hand, if after controlling for the mediator, the independent variable's influence on the dependent variable diminishes but still retains statistical significance, this indicates partial mediation. In this scenario, the mediator explains a portion of the relationship, but other factors may also contribute to the influence of the independent variable on the dependent variable.

#### **4.5.1 The mediating effect of learning environment in the relationship between E-learning adaptability and students' learning productivity.**

Testing for mediation was also done using the Sobel (1982) Mediator Test. Barron and Kenny (1986) posit that a mediator variable is a variable that explains the relationship between a predictor variable and a criterion variable. The mediating effect of learning environment in the relationship between E-learning adaptability and students' learning productivity was examined through the following steps:

**Step 1: Assessing the Total Effect:** Initially, we had to establish that E-learning adaptability (IV) is associated with students' learning productivity (DV) without considering the mediator. This relationship is referred to as the total effect (c path).

**Step 2: Identifying the Mediating Pathway:** Next, the relationship between E-learning adaptability and the learning environment (a path) and the relationship between the learning environment and students' learning productivity (b path) were established. These together form the indirect effect (a\*b path).

**Step 3: Assessing the Direct Effect:** The direct effect (c' path) is the relationship between E-learning adaptability and students' productivity, controlling for the mediator, i.e., learning environment. This helps in understanding how much of the total effect is mediated and how much is direct.

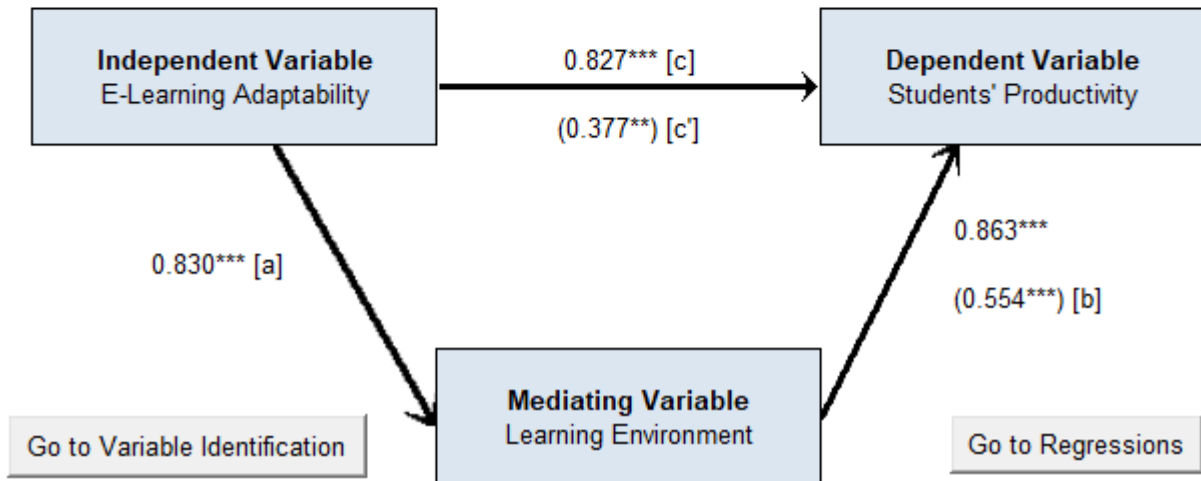
**Step 4: Calculating the Mediating Effect:** Finally, the mediating effect can be computed by comparing the direct and indirect effects.

If the mediator (learning environment) entirely accounted for the relationship between E-learning adaptability and students' learning productivity, we would have full mediation. If the mediator partly accounts for this relationship, we would have partial mediation.

The results are shown in figure 2 below:

**Figure 2: Medgraph illustrating the mediating effect of learning environment in the relationship between E-learning adaptability and students' learning productivity.**

<b>Type of mediation</b>	Significant	
<b>Sobel z-value</b>	5.21525	$p = <0.000001$
<b>95% Symmetrical Confidence interval</b>		
Lower	0.26051	
Higher	0.57421	
<b>Unstandardized indirect effect</b>		
a*b	0.41736	
se	0.08003	
<b>Effective Size measures</b>		
<u>Standardised Coefficients</u>		<u>R<sup>2</sup> Measures (Variance)</u>
Total:	0.827	0.700
Direct:	0.377	0.048
Indirect:	0.459	0.651
Indirect to Total ratio	0.556	0.930



The results in figure 2 show that the p-value is less than 0.01. The results therefore indicate that learning environment significantly though partially mediates in the relationship between E-learning adaptability and students' learning productivity.

## CHAPTER FIVE

### DISCUSSION, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

#### 5.0 Introduction

In this chapter there are four sections. The first section is the discussions in relation to the research objectives. The second section focuses on conclusions while the third section presents recommendations followed by sections on the areas for further research and limitations encountered in this study.

#### 5.1 Discussion of Findings

##### 5.1.1 The influence of E-learning adaptability on students' learning productivity.

The primary aim of the study under consideration was to investigate the effect of e-learning adaptability on the learning productivity of students. This refers to the capacity of learners to effectively utilize online learning tools and platforms and how this ability influences their academic performance and efficiency. By assessing this relationship, the study sought to understand how various factors related to e-learning could either enhance or hinder students' capacity to achieve their educational objectives.

The statistical data presented reveals a significant correlation between e-learning adaptability and students' learning productivity. This statistical finding implies that any change in e-learning adaptability, whether positive or negative, correlates with a corresponding change in students' productivity. When conditions such as technical support, superior internet experience, and enhanced system interactivity are present, an improvement in students' learning productivity can be expected. Conversely, if these conditions deteriorate, students' learning productivity may

decline. Therefore, the results underscore the anticipated connection that an enhancement in e-learning adaptability is likely to yield better student learning productivity.

The findings echo many of the assertions made in the literature. West, (2013) underlined the revolutionary role of e-learning in education, and this is mirrored in the survey's findings that highlight the significant role e-learning adaptability plays in students' productivity. Jacobs, (2013) also emphasized the role of digitized technology in enabling access to information and content delivery, which is congruent with the high correlation observed in the study, suggesting that increased access through e-learning adaptability contributes to improved productivity.

Furthermore, the findings corroborate Sung and Mayer's (2013) observations regarding the positive impact of e-learning on students' productivity. The survey's regression results, indicating that e-learning adaptability has predictive potential on student learning productivity, are consistent with Sung and Mayer's assertion that students' motivation to use e-learning is positively associated with enhanced productivity.

However, the literature also highlights that not all findings are consistent regarding the impact of e-learning on productivity. Sung and Mayer, (2013) and Froese et al., (2012) identified instances where e-learning had a negative impact on students' productivity. This inconsistency may arise from various factors such as the quality of e-learning content, availability of support, and students' digital literacy skills.

Olasina, (2018) and Gordon, (2014) pointed out the flexibility of e-learning in accessing content and allowing students to learn at their own pace and preferred style. However, Gordon, (2014) raised the issue that students in less developed countries may not fully realize the potential of e-learning. This is a crucial consideration since the generalizability of the survey's findings may be

contingent upon the context in which e-learning is being implemented. In regions with technological constraints, the positive correlation between e-learning adaptability and productivity may not be as pronounced.

In addition, Huang and Hsieh, (2012) argued that the adoption of e-learning is largely due to its operational effectiveness, standards, and underlying philosophy. The significant correlation found in the survey might be influenced by these attributes of e-learning, which are seen as conducive to academic productivity. Adding to the reviewed literature, Al-Rahmi, Othman, and Yusuf, (2015) indicated that the effectiveness of e-learning systems is influenced by interactivity, content quality, and motivation, among other factors. Thus, while the survey results suggest a robust correlation, it is imperative to consider the multifaceted nature of e-learning adaptability. Further, Lu and Chiou, (2010) demonstrated that the social presence in e-learning environments also plays a crucial role in students' learning outcomes. This suggests that the human aspect, and not just technological adaptability, is an essential component of effective e-learning systems.

In summary, the questionnaire of study findings largely aligns with the positive relationship between e-learning adaptability and students' learning productivity, as outlined in the literature. Nonetheless, the discussion should also acknowledge the complexity of e-learning adaptability and the various factors that may influence this relationship. Recognizing the multi-dimensional nature of e-learning and its context-dependent characteristics is key to understanding its role in students' productivity.

### **5.1.2 The influence of learning environment on students' learning productivity.**

The learning environment encompasses aspects such as student cohesiveness, teacher support, and overall involvement, and its correlation with students' learning productivity was a primary focus

of the research. The statistical findings in the given table show a significant connection between the learning environment and students' learning productivity.

The data suggests that variations in the learning environment correspond to alterations in students' productivity, in both positive and negative directions. Improvement in aspects of the learning environment, such as enhanced cohesion among students, increased support from teachers, and heightened involvement, is expected to lead to an enhancement in student productivity. Conversely, deficiencies in these areas may lead to a decrease in learning productivity. In essence, the results imply that a positive shift in the learning environment will likely result in better student productivity, in line with the expectations set forth at the commencement of the study.

The findings align well with the literature that has been reviewed. Balog, (2018) identified various components of the learning environment, including people, teaching materials, technical tools, learning resources, curriculum, training, instruction, and the physical environment. The positive correlation observed in the university survey findings lends support to Balog's assertion that these components are integral to the learning curve of students.

Furthermore, Waldman, (2016) emphasized the importance of a safe learning environment where students feel welcomed, supported, and respected. The strong association between the learning environment and students' productivity, as indicated by the survey, corroborates Waldman's observation. It suggests that when students are nurtured in an environment where they feel secure and connected to their educators and peers, their productivity is likely to be enhanced. The emphasis on social and emotional learning (SEL) and the need for support from educators, family, and community, as pointed out by Waldman, (2016), could be key elements that contribute to the positive correlation observed in the survey.



In addition, the survey findings are in agreement with empirical research conducted by Shamaki (2015), Adamu, (2015), and Duruji et al., (2014), which found significant differences in students' learning productivity based on the learning environment. These studies noted the positive impact of an ideal learning environment, adequate facilities, and qualified teachers on students' performance, which is consistent with the university survey results that suggest improvements in the learning environment lead to better students' productivity.

Recent studies further bolster this connection. For instance, Turner and Finch, (2022) emphasized the importance of adaptive learning environments in fostering academic achievement, particularly in higher education. They concluded that environments that promote adaptability in learning strategies significantly contribute to students' academic success. Another study by Al-Hattami, (2021) indicated that the learning environment's physical aspects, such as lighting, classroom arrangement, and access to learning resources, directly impact students' motivation and engagement, which in turn affects their productivity. This is congruent with the findings of Duruji et al., (2014) and further emphasizes the multifaceted nature of the learning environment.

However, it is also crucial to recognize that the learning environment is a complex construct and that there may be individual differences in how students respond to different environments. For example, a study by O'Neill and Sai, (2021) suggested that while the physical environment is essential, the psychological perception of the learning environment also plays a significant role in student outcomes. This indicates that a holistic approach, considering both the tangible and intangible aspects of the learning environment, is essential for understanding its impact on student learning productivity.

The survey findings are in harmony with the existing literature, emphasizing the positive correlation between the learning environment and students' learning productivity. The

incorporation of safe and supportive spaces, the availability of resources, and an emphasis on social and emotional learning are some of the pivotal components in creating an effective learning environment conducive to enhanced student learning productivity.

### **5.1.3 The mediating effect of learning environment in the relationship between E-learning adaptability and students' learning productivity.**

The findings that indicate the learning environment significantly mediates the relationship between E-learning adaptability and students' learning productivity adds depth to the literature reviewed. The existing literature has largely treated E-learning adaptability and learning environments as separate entities influencing student productivity, but the findings show an interwoven relationship.

Alalwan et al. (2013), Cho et al. (2018), Crompton (2013), and Emerson and Berge (2018) emphasized the role of the learning environment in student productivity, and Gordon (2010) highlighted that E-learning has its learning environment. By linking these perspectives, it becomes evident that the quality and characteristics of the learning environment in which E-learning takes place are critical to the E-learning adaptability. The findings appear to be in consonance with this interrelation.

For example, Gupta and Koo (2012) touched upon several questions about the E-learning environment such as where the students are learning from, the efficiency of the gadgets, and the physical environment which includes lighting, noise, and clutter. These aspects are part of the learning environment, and the findings suggest that they have a mediating effect in the relationship between E-learning adaptability and students' learning productivity. This is in alignment with what

Jacobs (2013) and Jakobsen & Jensen (2015) alluded to regarding the importance of optimizing the learning environment and adapting learning habits for effective E-learning.

Recent literature adds further depth to this relationship. Park and Bonk (2022) posited that in an E-learning setting, the technological and social aspects of the learning environment play a significant role in learners' adaptability. They noted that an environment that fosters social presence and supports various learning modalities enhances the adaptability of E-learning tools, which in turn impacts students' learning productivity. This lends further support to the findings and suggests that the learning environment's role is multifaceted and goes beyond being a mere facilitator; it acts as a conduit through which E-learning adaptability translates into student learning productivity.

Moreover, Liu and Hallinger (2021) asserted that the pedagogical choices and instructional design in E-learning are greatly influenced by the learning environment. This implies that an adaptive E-learning system requires an adaptable learning environment, which again underlines the mediating role of the learning environment.

In addition, Lin, Yu, and Lai (2021) found that in E-learning, the psychological aspects of the learning environment, such as a sense of belonging and support, are essential for students to adapt effectively to online learning platforms. This further corroborates the notion that the learning environment is an integral mediator in the relationship between E-learning adaptability and students' learning productivity.

In summary, the findings dovetail with and enrich existing literature by shedding light on how the learning environment serves as a bridge between E-learning adaptability and students' learning productivity. It is evident that a conducive learning environment, encompassing physical,

technological, social, and psychological aspects, is central to how effectively students can adapt to E-learning, and in turn, how this adaptability influences their learning productivity.

## **5.2 Conclusion**

The relationship between E-learning adaptability and students' learning productivity is both multifaceted and crucial, especially in contemporary educational contexts. E-learning, through its accessibility and flexibility, provides students with an opportunity to tailor their learning experiences according to their own pace and preferences. The literature and empirical findings indicate that there is a significant positive correlation between E-learning adaptability and students' learning productivity. It is evident that as E-learning systems evolve to be more adaptive, catering to the diverse learning styles and needs of students, there is an observed increase in students' learning productivity. This is due to the ability of adaptive E-learning to provide a more personalized and engaging learning experience. Moreover, E-learning adaptability is not just a static feature; it represents a dynamic adjustment process that encompasses the technological, educational, and social domains of the learning experience.

The learning environment plays a pivotal role in students' learning productivity by shaping the conditions under which learning takes place. An optimal learning environment, which includes a supportive atmosphere, appropriate physical settings, and access to necessary resources, significantly contributes to enhancing students' engagement, motivation, and, consequently, their academic productivity. When students feel safe, supported, and equipped with the right tools and resources, they are more likely to excel academically.

The learning environment serves as a critical bridge between e-learning adaptability and students' learning productivity. When e-learning is adaptable, it caters to the diverse needs of learners, but

it is through a conducive learning environment that these adaptable resources can be effectively utilized. An enabling learning environment maximizes the benefits of e-learning by providing students with the necessary support, tools, and atmosphere, which in turn, significantly enhances their learning productivity.

### **5.3 Recommendations**

Educational institutions and stakeholders should focus on creating adaptive learning environments that cater to the diverse needs of students. This includes investing in technological infrastructure, training educators in the effective use of E-learning platforms, and creating social support systems. Additionally, attention should be paid to the psychological aspects of the learning environment, such as cultivating a sense of belonging and ensuring students have access to mental health resources.

It is important to continuously evaluate the efficacy of E-learning platforms in terms of adaptability and student productivity. Feedback from students and educators should be systematically collected and analyzed. This information should be utilized to make informed decisions regarding updates, improvements, and the integration of new features in E-learning systems to ensure that they remain adaptive and effectively contribute to enhancing students' learning productivity.

Institutions should not only provide access to e-learning tools but also ensure that students and staff are adequately trained to use these resources effectively. This includes technical support, tutorials, and feedback mechanisms, which will enable students to make the most of e-learning adaptability within a supportive learning environment.

Educational institutions should make investments in not only the physical aspects of the learning environment such as classrooms, libraries, and technology but also in creating a psychologically

supportive atmosphere. This can be achieved through programs that promote mental well-being, social engagement, and positive reinforcement.

Understanding that students have diverse learning preferences and needs, educational institutions should work toward providing a variety of learning materials and tools. This can include alternative seating arrangements, digital resources, interactive learning tools, and personalized learning plans, which cater to different learning styles and thus contribute to enhancing productivity.

#### **5.4 Limitations**

This study used a cross sectional research design approach, which is limited to the situation at the time the study is done and does not focus on historical trends in the variables, which might shed further light on the situation.

The study was restricted to the selected universities, and yet the circumstances might not be the same in other organizational, sectoral or regional contexts.

The study used a quantitative approach and ignored qualitative aspects that may exist and which might have filled the gaps left by using strictly quantitative methods.

#### **5.5 Areas for further study**

It would be beneficial for upcoming studies to employ a longitudinal design, as relying on cross-sectional research could inadvertently introduce biases in the outcomes, leading to erroneous conclusions that do not accurately reflect the realities on the ground.

It is imperative for additional investigations to be undertaken across different service sectors to determine if the relationships between the variables under consideration hold consistently in varied contexts. This suggestion is based on the distinct relationships revealed in this study's results. The

education services sector, including its lower tiers, serves as an exemplary context for such investigations.

This study has indicated that e-learning adaptability and the learning environment do not comprehensively account for student learning productivity. Therefore, future research should delve into investigating other contributing factors to student learning productivity. Potential variables to explore include the quality of services, the ratio of teachers to students, and teaching methodologies, among others.

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## APPENDIX

### QUESTIONNAIRE

#### Introduction;

Dear respondent,

I am Christine Kuteesa, a student at Makerere University Business School. I am pursuing a Masters Degree of Science in Accounting and Finance. I am carrying out research about “**E-LEARNING ADAPTABILITY, LEARNING ENVIRONMENT AND STUDENTS’ LEARNING PRODUCTIVITY IN UNIVERSITIES.**” You have been identified as a key and valuable respondent in carrying out this research because of your vast and related experience. This research is purely academic. Your responses will be treated with utmost confidentiality and will be purely used for the purpose of this study. It’s therefore my humble request to spare part of your valuable time and answer the following questions.

#### Part I SECTION A: PROFILE OF RESPONDENTS

1. At what level are you in this institution?

.....

2. What is your gender?

MALE

FEMALE

3. How old are you?

a). 18-25  b). 26-30  c).31-35  d). 36-40

e). 41-45  f). 46-50  g). 51 and above

4. What is your marital status?

a). Single  b). Married

5. How long have you been in this school?

- a). Less than a year     b). 1-2 years     c). 3-5 years   
 d). 6-10     e). Over 11 years

6. QUALIFICATIONS

Certificate	Diploma	Bachelor's degree	Post graduate diploma	Master's Degree	Any other (please specify)

**SECTION B: STUDENTS' LEARNING PRODUCTIVITY**

In the list provided below, kindly indicate by ticking the extent to which you agree to the below statements as follows; (1) strongly disagree, (2) disagree, (3) not sure, (4) agree, (5) strongly agree.

	<b>Communication</b>	1	2	3	4	5
C1	I am able to communicate effectively with my colleagues					
C2	I find it easy to communicate with my lecturers at any time.					
C3	Clear communication gives me a clear direction in my studies.					
C4	Communication in this institution is efficient and effective					
C5	We receive timely communication in this institution.					



	<b>Skills</b>					
S1	I have acquired different skills from what I learn at this institution.					
S2	I am able to perform well if I am employed in the field of my study					
S3	I can use the minimum period of time to perform a given task in my area of study.					
S4	My area of study has equipped me with practical skills.					
S5	I have gained different skills that are not related to my area of study in this institution.					
	<b>Creativity</b>					
CR1	I am able to make or bring into existence something new in my area of study.					
CR2	I am able to create solutions to the industry in line with my study					
CR3	My area of study is full of new exploitable ideas.					
CR4	Creativity broadens my perspective and helps me to overcome prejudices.					
CR5	My creativity is based on my learning.					

## SECTION C: LEARNING ENVIRONMENT

In the list provided below, kindly indicate by ticking the extent to which you agree to the below statements as follows; (1) strongly disagree, (2) disagree, (3) not sure, (4) agree, (5) strongly agree.

	<b>Student cohesiveness</b>	1	2	3	4	5
SC1	I feel a sense of belonging in this institution.					
SC2	There is team work and solidarity among the students in this institution.					
SC3	There is positive interpersonal relations between students in this institution.					
SC4	I participate in different activities in this institution which makes me more cohesive with others.					
SC5	In this institution, students focus on the collective happiness instead of individual gains.					
	<b>Teacher support</b>					
PC1	I get support from my lecturers especially on hard course units.					
PC2	I can access my lecturers at any time I need their help.					
PC3	My lecturers respond to my emails on real time.					
PC4	My lectures are approachable and friendly					
PC5	My lectures give me informational, instrumental, emotional, or appraisal support in any environment					
	<b>Involvement</b>					
NO1	The learning environment we study in accommodates people with special needs.					
NO2	Management is also involved in the affairs of the students in this institution.					
NO3	This learning environment gives equal chances to both female and male.					
NO4	Involvement in this school makes me invest in psychological learning.					

NO5	Our institution engages us with our interests.					
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**SECTION D; E-LEARNING ADAPTABILITY**

In the list provided below, kindly indicate by ticking the extent to which you agree to the below statements as follows; (1) strongly disagree, (2) disagree, (3) not sure, (4) agree, (5) strongly agree.

	<b>Technical support</b>	1	2	3	4	5
PU1	I get support from E-learning team whenever I need it.					
PU2	The E-learning team offers immediate response whenever contacted.					
PU3	The E-learning team is reliable and available at any time.					
PU4	I can access affordable technical support that I need to learn online.					
PU5	Sometimes I don't have access to the resources that I need to long in to e-learning platforms of this institution.					
	<b>Internet experience</b>					
PE1	I have no problem with using any internet to learn					
PE2	I can access internet from anywhere in this institution					
PE3	The internet that I use is fast					
PE4	The internet that I use to study is reliable					
PE5	The internet that I use is affordable					
	<b>System interactivity</b>					

PC1	E-learning platforms can be supported by different computer devices.					
PC2	I can use different search engines to access E-learning platforms.					
PC3	I can access my details like marks and financial statements using by just switching from one platform to another.					
PC4	I can access zoom through the e-learning platforms.					
PC5	I can send texts and emails to my lecturers through our e-learning platforms.					