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THE UNIVERSITY OF YAOUNDE I

DOCTORAL RESEARCH AND TRAINING CENTRE
(CRFD) IN "SOCIAL AND EDUCATIONAL SCIENCES"

DOCTORAL RESEARCH AND TRAINING SCHOOL
IN EDUCATION AND EDUCATIONAL ENGINEERING

VIRTUAL LEARNING ENVIRONMENTS AND SELF-EFFICACY BELIEF AMONGST STUDENTS OF THE UNIVERSITY OF YAOUNDE-I

A Dissertation Submitted in Partial Fulfilment of the Requirement for the Award of A
Master's Degree in **Science of Education (SED) Option: Psychotechnical Engineering**

By

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CERTIFICATION

I, the undersigned hereby certify that this study title: Virtual learning environments and self-efficacy belief of students of the university of Yaoundé 1 was carried out by **Ngo Mutsi Mahi Florence**, matriculate **18X3900**, a student of the department of Curriculum and Evaluation in the University of Yaounde 1.

DEDICATION

To

The ARREYMOH family

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TABLE OF ABBREVIATION AND ACRONYMS

ANOVA	Analysis of Variance Validation.
CBA	Competency Based Approach
C.O.I.	Community Of Inquires
C.V.I.	Content Validity Index
E.F.A.	Education For All
I.C.T.	Information and Communication Technology
J.I.S.C.	Joint Information Systems Commission
L.M.S.	Learning Management Systems
NPA	New Pedagogic Approach
O.C.L.	Online Collaboration Learning
O.D.L.	Online Distance Learn
R.Q.	Research Question
S.N.A.	Social Network Analysis
SYDIME	Système de Diagnostic Médical
UY1	University Of Yaoundé 1
V.L.E	Virtual Learn Environments
V.T.E.	Virtual Training Environment

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ABSTRACT

The 21st century workforce is mark by an ever changing dynamics as a ramification of the digital knowledge which has marked this era resulting to diversity. The purpose of the present study was to find out the extent to which virtual learning environments affect the self-efficacy of students in the University of Yaoundé I. Specifically, the study aimed at examining 1) the extent to which online learning platforms affects self-efficacy belief amongst students 2) extent to which open source education search engines affects self-efficacy belief amongst students 3) the extent to which social networks affects self-efficacy belief amongst students. A descriptive survey method was chosen for the study, with the use of a questionnaire to collect data. 200 hundred students form year 1, 2 and 3 from the faculty of Sciences of Education were chosen for the study. The results of the study showed that 1) there is a positive relationship between online learning platforms and self-efficacy of students. This relationship is significant with a P value of 0.003; 2) there is a positive relationship between open source education search engines and self-efficacy of students. This relationship is significant with a P value of 0.002; 3) there is a positive relationship between social networks and self-efficacy of students. This relationship is significant with a P value of 0.002. Nonetheless, it is worth noting that when comparison was made between the age groups. It was discovered that there was a significant difference between those from 30 years and above and those below in the use of the university online learning platform. Those form 30 years above showed more mastery in the use of the university online learning platform than those below the age of 30. But there was no significant difference in the use of open source education search engines and social networks between the various age groups. Many factors are experienced by educators, affecting the quality of their teaching and their use of the VLE to the benefit or detriment of the mature student. The better trained and supported the educator, the better they will be able to support the special requirements of the university student.

Key words : Virtual learning environment; online learning platform, Open source search engines; Social networks; Self-efficacy

RESUME

La main-d'œuvre du 21^e siècle est marquée par une dynamique en constante évolution comme une ramification du savoir numérique qui a marqué cette ère porteuse de diversités. Le but de la présente étude était de déterminer dans quelle mesure les environnements d'apprentissage virtuels affecte l'auto-efficacité des étudiants de l'Université de Yaoundé I. Plus précisément, l'étude visait à examiner tout d'abord dans quelle mesure les plateformes d'apprentissage en ligne affecte l'auto-croyance. Ensuite, dans quelle mesure les moteurs de recherche à accès libre de l'éducation affectent la croyance en l'efficacité personnelle chez les étudiants. Enfin, dans quelle mesure les réseaux sociaux affectent la croyance en l'efficacité personnelle chez les étudiants. Une méthode d'enquête descriptive a été choisie pour l'étude, avec l'utilisation d'un questionnaire pour recueillir des données. 200 étudiants de niveau 1, 2 et 3 de la faculté des sciences de l'éducation ont été choisis pour l'étude. Les résultats de l'étude ont montré que dans un premier temps qu'il existe une relation positive entre les plateformes d'apprentissage en ligne et l'auto-efficacité des étudiants. Cette relation est significative avec une valeur P de 0,003 ; dans un second temps qu'il existe une relation positive entre les moteurs de recherche à accès libre pour l'éducation et l'auto-efficacité des étudiants. Cette relation est significative avec une valeur P de 0,002 ; enfin dans un troisième temps qu'il existe une relation positive entre les réseaux sociaux et l'auto-efficacité des étudiants. Cette relation est significative avec une valeur P de 0,002. Néanmoins, il convient de noter que lorsque la comparaison a été faite entre les groupes d'âge. Il a été découvert qu'il y avait une différence significative entre ceux de 30 ans et plus et ceux dont l'âge est inférieur dans l'utilisation de la plateforme d'apprentissage en ligne de l'université. Les étudiants dont l'âge est en dessous de 30 ans ont montré plus de maîtrise dans l'utilisation de la plate-forme universitaire d'apprentissage en ligne que ceux dont l'âge est supérieur à 30 ans. Mais il n'y avait pas de différence significative dans l'utilisation des moteurs de recherche open source et des réseaux sociaux entre les différents groupes d'âge. De nombreux facteurs sont vécus par les éducateurs, affectant la qualité de leur enseignement et leur utilisation des environnements virtuel au profit ou au détriment de l'étudiant adulte. Mieux l'éducateur est formé et soutenu, mieux il sera en mesure de répondre aux exigences particulières de l'étudiant universitaire.

Mots clé : Environnement d'apprentissage virtuel ; Plateforme d'apprentissage en ligne, moteurs de recherche accès libre ; Réseaux sociaux ; Auto-efficacité

GENERAL INTRODUCTION

1. INTRODUCTION

The 21st century workforce is marked by an ever-changing dynamics as a ramification of the digital knowledge which has marked this era resulting to diversity. Employees in this era consist of digital natives and digital immigrants, groups that must be taught using different strategies (Prensky, 2001). Digital natives are individuals who have spent their entire lives with digital technologies. Digital immigrants have not had the opportunity to engage with technology since their childhood. According to Prensky (2001), most digital immigrants require more assistance with their technology usage. For the workforce to succeed in the 21st century, teachers must be able to explore and select education options that are suitable for the 21st century (Mirci & Hensley, 2010). Greenstein (2012) argued that 21st-century learning should include tasks that help learners improve their skills in critical thinking, creativity, problem solving, metacognition, communication, collaboration, and information and technology.

Virtual Learning Environments (VLE) can support 21st-century learning by providing teachers with the opportunity to create effective learning opportunities for learners that are appropriate for the 21st century (Knutsson et al., 2011). They afford learners an opportunity to learn based on their individual needs and learning styles (Mueller & Strohmeier, 2011). VLEs also offer schools with cost-effective means to train a diverse workforce irrespective of their topographical locations. According to Mueller and Strohmeier (2010), these factors make VLEs ideal learning vehicles for training. Web- and digital-based technologies, online learning, and VLEs have promoted wide interest in the activities of knowledge creation and knowledge sharing (Bell, 2011). They are widely used today as learning solutions (Knutsson et al., 2011). Fagan (2014) argued that online learning is suddenly becoming a key part of institutional success strategy.

The Talent Development 2016 State of the Industry Report, sponsored by Bellevue University and Training Associates, revealed that technology-based and online learning accounted for 41% of all learning hours (Ho, 2016). This was 10 percentage points higher than training delivered through technology-based and online learning in 2008, and 15 percentage points higher than technology-based and online learning in 2003 (Ho, 2016). This research shows that even in the workplace as is the case in schools, there is a dramatic increase in the use of online learning. Although VLEs are used quite frequently in the schools, there is still a

need for further research (Saleeb&Dafoulas, 2010). This is due to the fact that VLEs are diverse in their capabilities and functionalities. Their systems design and characteristics range from simple to complex (Burton & Martin, 2010; Mogus et al., 2012; Mueller & Stroh Meier, 2011). Design characteristics are critical to an effective VLE (Mueller &Strohmeier, 2011). Research is still needed to apprehend how learners learn in VLEs. The purpose of this study was to explore how a VLE impacted adult learners' motivation in the schools. Very little research was found that addressed motivational concerns in the VLEs. Research from this case study adds to the literature on designing and developing VLEs that are effective in increasing motivation and improving learner perceptions and learner satisfaction.

The aim of this study was to help improve the overall learning experience and learning outcomes of learners. The problem with the prevalence of VLEs in schools (Ellis, 2013), is that students' motivation and learning outcomes are impacted by poor design and usage of the VLEs (Saleeb&Dafoulas, 2010). This can result in poor learning transfer and ultimately affect overall academic performance. The issues for VLEs are centred on their design and on how learners use the VLE. There is no one-size-fits-all formula for the design of a VLE (Mogus et al., 2012). This can pose problems for teachers because there is limited research on which design factors and characteristics yield the most effective learning opportunities for students in schools. Teachers have the responsibility of finding innovative technologies to provide effective and efficient learning interventions for employees (Li, D'Souza, & Du, 2011). A key concern is that many of these technologies used for learning and development must be customized for educational or training purposes (Chapman & Stone, 2010).

There is limited agreement as to how the use of technology directly impacts students' learning or performance (Chapman & Stone, 2010). Research in academic settings has shown that online learning has been associated with students feeling disconnected with their learning environment (Baxter & Hancock, 2014). This could contribute to lower levels of motivation for learners. Motivation is the precursor to learning and is a heavy influencer of individual learning (Mayer, 2011). However, there is very little research on motivation in VLEs in schools, especially in countries where is poor internet connection and ever increasing digital divide (Hartnett et al., 2011). Understanding how information and communication technology (ICT) and collaborative learning in VLEs impact motivation in learners can provide valuable information on design decisions for VLEs. Research on VLEs can help to teachers on best practices for using VLEs as a platform for delivering training and development to learners (Chapman & Stone, 2010).

Research has demonstrated that Computer Self-Efficacy (CSE) would also exert a significant influence on individuals' emotional reactions to using computers, as well as their actual computer use (Campeau and Higgins, 1995). Self-efficacy, the belief that one has the capability to perform a particular behaviour, is an important construct in social psychology. Self-efficacy perceptions have been found to influence decisions about what behaviours to undertake (Barling and Beattie., 1983; Betz and Hackett, 1981), the effort exerted and persistence in attempting those behaviours (Brown and Inouye, 1978), the emotional responses (including stress and anxiety) of the individual performing the behaviours (Bandura, 1977), and the actual performance attainments of the individual with respect to the behaviour (Barling et al., 1983; Locke and Latham, 1990; Wood and Bandura, 1989). Bandura (1986) defines self-efficacy as: People's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance. It is not with the skills one has but with judgments of what one can do with whatever skills one possesses (p.391).

Virtual learning environment (VLE) have recently emerged as an important topic in education theory and practice, (Weller, 2007). In theory, a well-maintained VLE should enable students of all learning styles to receive the best possible education in a way that may not in an exclusively lecture-based environment which tends to be focused on auditory learners only, (Vigentini, 2009). If the resources on a VLE do not cater to the needs of the students both in terms of their format (text files, audio files, videos etc.) and their content. The VLE is effectively rendered useless if it does not add to the students' learning experience. A student's experience in the classroom or lecture theatre depends on how well the teaching style fits with their individual learning style. The same issue exists with virtual systems and a variety of resources is needed in order to provide adequately for all learning styles (visual, auditory and kinaesthetic).

Many higher education institutions are increasingly fragmented and lacking in cohesion or unity (Whitworth, 2005) and regards VLEs as a way to help overcome the problems introduced by the national increase in the number of students coming to university and the higher workload that this entails for lecturing and support staff. It can therefore be said that there are three types of VLE that is those with too much information which discourage students from attending lectures, those with little which render the VLE useless and those with just enough to allow students to reinforce their work in lectures.

A report on Education for All (2005) clearly indicated the need to move beyond the culture of current schooling system (Education for All, 2005). The report explained that despite concerted efforts of schools around the world, it is becoming obvious that present educational systems are ill-equipped for taking on the challenges that lie ahead. Today, there are still nearly one billion illiterate people in the world, 130 million school-aged children out of school, and very few options for supporting the continuing learning needs of those who have dropped out of schools or who have no possibility of joining the school. According to World Economic Situation and Prospects (United Nations Human Development Report 2003), more than 1.2 billion people – one in every five on Earth – survive on less than USD1 a day. The same report explained that countries can spend more on education as they grow, but the poorest countries need to spend more on education to escape the poverty trap. Carliner and Shank (2008) strongly believed that the future of learning is inextricably tied to the use of technology for learning, and Cheung et. al., (2004) ascribed that e-Learning is an answer to tomorrow's learning needs.

With technological advances, the distance and regional boundaries are almost invisible; and the world is going through a major change in learning. Internet technologies have fundamentally altered the technological and economic landscapes so radically that it is now possible to make quantum leaps in the use of technology for learning.

Successful e-Learning depends on building strategy that optimizes the technology within any school culture that is ready and willing to use it. In today's fast paced technology and knowledge driven market economy, organizations need schools to train a workforce that performs faster and better than the competition, and they need to do this 24 hour a day, seven days a week and three hundred sixty-five days a year. Rosenberg (2001) explained that the time is now to build an e-Learning strategy that meets the needs of today's workers, some of whom are ready for this change and others who will need help in the transition. And now is the time to build an even greater capability to deliver on this strategy for an increasingly technology-savvy workforce. As the need for learning and knowledge has outstripped what's possible using conventional learning methods, e-Learning will allow us to respond more effectively. e-Learning has never been so important, and our opportunities have never been greater. "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn" said Alvin Toffler (as cited in Rosenberg, 2001, p. 3).

2. CONTEXT AND JUSTIFICATION

Education is the pillar on which various states of the world rely to provide their societies with role models whose skills and behaviors are adapted to the needs of these everchanging societies. It is also through this education that each state can guarantee not only the training of its citizens, but also the preservation of the social and cultural values, which are dear to it. It is in this capacity that Durkheim (1922, p. 105) defined education by saying: "Education is the action exerted by the adult generations on those who are not yet socially mature. Its objective is to arouse and develop in the child a certain number of physical, intellectual and moral states demanded of him and of political society as a whole and the special environment for which he is particularly intended ". For Cameroon, education is the vision through which the state trains citizens who respond not only to political visions, but also who respond to the needs of a society that is evolving in a globalized world.

To this end, the state of Cameroon has made education a high national priority (Law N ° 98/004 of April 14, 1998 on orientation of education in Cameroon, Article 2, Paragraphs 1 and 2). This education had been endowed with a system whose main mission is; "The general mission of education is the training of the child with a view to his intellectual, physical, civic and moral development and his harmonious integration into society, taking into account economic, socio-cultural, political and moral factors". (Law No. 98/004 of April 14, 1998 on the orientation of education in Cameroon, Article 4). This mission demonstrates that education does not have the intellectual training of the pupil as its sole mission.

The combination of these objectives of the Cameroonian education system according to Mvesso (2015) thus answers the questions "Why ". This question leads to another, which is the "How? 'Or' What ". This how thus leads to teaching methods and practices. The desire of the state of Cameroon to offer citizens a quality education is manifested through the changes in educational paradigms with a view to finding a paradigm that best meets its visions and the many changes in international society. This change in the educational paradigm by the Cameroonian education system has thus manifested itself in the shift from a so-called transmissive teaching method to a method called the *Main à la Pate*. Subsequently, we went from hand-to-hand for the New Pedagogical Approach (NPA); we then started with the Objective Based Approach (OBC) and ended up with the Competency Based Approach (CBA).

Adoption of the CBA as a new paradigm in the Cameroon's education system has developed gradually. This integration of the CBA into the Cameroonian education system began at the primary level in 2003. This Adoption of the CBA as an educational paradigm has

also led the Cameroonian education system to adopt computer science not only as a school discipline in the same way as geography, history, mathematics etc.

Efforts to introduce ODL in Cameroon began over four decades ago. In 1998, COL financed a baseline study on the state of ODL in Cameroon, as a response to a request made by the Ministry of National Education (Peku, 1998). The study reported that attempts were made to use distance learning in Cameroon's educational system between 1967 and 1994 to address the problem of falling standards of education largely blamed on the lack of qualified teachers and access to education at all levels. The programme, which targeted both qualified and unqualified teachers, sought to upgrade them professionally. The study observed that the programme failed mainly because of poor funding and non-availability of appropriate learning materials. Peku (1998) further remarked that, at the level of higher education, the Higher Teacher Training College Yaoundé, had a distance education programme designed to improve the competence of teachers to teach French as a second language. However, that programme eventually failed.

Also as a didactic tool for all teachers. The integration of ICT into the Cameroonian education system dates back to the 2000's, this educational Presidential Decree No. 2002/004 of January 04, 2002 and Order No. 65c / 88 / MINEDUC / CAB of February 18, 2001 of the Minister of Education national implemented integration of ICT. Order No. 65C / 13 / MINEDUC / CAB of February 16, 2001, introduces ICT into the training programs of General Education Teachers.

In the same case, Order N ° 3745 / P / 63 / MINEDUC / CAB of June 16, 2003 introduces computer science in general education. In addition, decision No. 249106 / MINESEC / CAB of May 15, 2006 finally fixes the roles of multimedia resource centers created within schools. More specifically, IT and ICT officially entered secondary schools in November 2001 with the inauguration of the multimedia resource centers (CRM) of the general LECLERC high schools and the bilingual high school of LECLERC in Yaoundé. His Excellency Paul BIYA, President of the Republic, introduced by this act himself the use of NICTs in secondary education in Cameroon. Thus introduced, the use of ICT in secondary education obeys several objectives: the teaching of computers and the appropriation of ICT by the pupils as soon as there is a program for this teaching, in addition, teachers are trained for this purpose and computer laboratories are been created in schools.

The use of ICT to teach and to learn other subjects; the introduction of computer science as a compulsory test in general secondary education examinations; the effective start

of the ICT sector. In this development, educational digital technology appears to be a fundamental didactic resource in education. The integration of ICT in pedagogy can also increase the motivation of students to learn, improving academic success of learners, to facilitate the assimilation of the concepts taught, and the facilitation of teaching. From this pedagogical innovation, it is clear that teachers can use ICT tools in their class as long as this tool are allow to be use in teaching differently, but also increases learning. Presentation (Djeumeni, 2010).

To support this integration of ICT in education, in September 2007, at the request of the Minister of Secondary Education, the Minister of Higher Education will proceed with the creation of an ICT and ICT sectorate at Ecole Normale Supérieure in Yaoundé. According to Mbock (2008), the very first teachers from this promotion have been in the field since 2009. Based on these training courses, educational stakeholders in Cameroon and the public authorities wanted to develop a set of skills among teachers, in particular: training qualified teachers in ICT, introduce teachers of other subjects (disciplines) to the use of ICT as a teaching tool, support school management with ICT (Fouda , 2009). Today, the pedagogical integration of computing has evolved considerably. We have seen the creation of ICT centers in universities for computer science courses that were formerly housed in mathematics departments.

In the past two decades, higher education in Cameroon has undergone many changes in an effort to respond to a number of major challenges: limited access and insufficient diversity in provision of tertiary education, gender parity, reduced funding, quality assurance and good governance. These changes arose from increasing pressures to respond to market forces and technological opportunities with limited resources and the competitive climate imposed by globalization, technological changes, and the ever changing needs and demands of society. One of the major areas of reform has been the introduction and development of distance learning initiatives.

In response to these challenges, a national forum entitled: National Forum on Distance learning (Forum National sur l'Enseignement à Distance) was held in Yaoundé from the 16th to 19th of September 2003 on "Distance learning: An alternative for increasing diversity, to access and to quality in education". The Ministries of National, Technical and Vocational Training and Higher Education jointly organized this forum under the aegis of the Commonwealth of Learning. The main objective of the forum was to open dialogue among all stakeholders on the

national needs, priorities and challenges in the design and implementation of Open and Distance Learning (ODL) in Cameroon and to propose to Government elements of a national strategy or road map for the implementation of distance learning. Following this conference, state universities started initiating and engaging in collaborative ventures to gather experience to enable them eventually initiate and implement distance learning programmes.

The university management of the University of Yaoundé I in the early years of 2000, was faced by structural challenges due to rapid increase in student number and aware of the potentials of e-learning, decided to elaborate a plan of action to improve the access and quality of its academic programmes. In 2006, the University partnered with the United Nations University and together with a multi-disciplinary team of dedicated professors and support staff elaborated a strategic plan to deploy e-learning at the University.

A first pilot phase was planned to create the e-learning centre and produce five e-learning course modules. In 2008, the project leader, Professor Mama Foupouagnigni, was invited by United Nations University, to stay as a visiting professor for two months to gain expertise by working with UNU-ViE e-learning expert, and elaborated the plan and met with different German university experts and donors (DAAD, private companies).

The future phase included capacity building of the e-learning team, to host the e-learning centre and produce the first series of e-learning course content, leverage of additional resources, and mainstreaming of e-learning practices at a larger scope at the university. From 19–23 October 2009, UNU-ViE and the University Duisburg visited the University of Yaoundé I, Cameroon's oldest university, to explore possibilities for advancing the institutional collaboration and conduct training on the production and diffusion of e-learning content at University of Yaoundé I. The training was a first step in building the capacity of professors from various disciplines as well as their students to produce course content in the Learning Management System Moodle. In order to concretize the objectives of the implication of ICT and construct a lasting and efficient platform, the e-learning project was organised in four e-schools, each serving as an upward phase towards accomplishment and subsequent dissemination. Three e-schools were held so far for a target group of lecturers who in future will assist other lecturers as resource persons in the multiplication effective ICT use. The schedule of the e-schools and specific engagement was presented as such:

- July 2011 e-school 1: eLearning in higher education, conceptions and templates

- December 2011 e-school 2: Content development and content organization for eLearning
- April/May 2012 e-school 3: Teaching and learning with eLearning; different models

November 2012 e-school 4: Quality assessment and review of eLearning content and learning processes.

While the first three e-schools were home based at the University of Yaoundé I's Information and Technology Centre, the fourth took place in the Baden-Württemberg Cooperate State University-Germany as an enlarged international conference. Through the Fact Finding Mission the participating researchers and both institutions had the opportunity to elaborate strategies and assess the local situation and stakeholders needs. An e-learning seminar helped to raise awareness and mobilize local stakeholders in a process of e-learning development within the University of Yaoundé I.

Historically, at the University of Yaoundé I, Boyom Sop Flaubert developed a Virtual Campus, which should simulate campus activities into a computer and shall encompass a data base geared toward a Course Management System, a navigation tool and different tools for the personalised management (Learner, Teacher).

SYDIME (Système de Diagnostique Medical) developed at the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I by Yatchou is a simulator that generates a set of assessments related to virtual patients. An emotional pedagogical agent assures the guidance of the learner while case based reasoning is used to validate his forecasting. Developed with Java, it offers students the acquisition of medical knowledge based on simulation of diseases.

Today, the University of Yaoundé I is now pointing their students to the available lecture materials online and the university Yaoundé has its first eLearning portal up and running and available for students and teachers (<http://elearning.uninet.cm/moodle/>).

The motivating factor for this study is based on my experience as a student in the University of Yaoundé I. I am interested in understanding how VLE and self-efficacy help in students' achievement, which VLE is being use for learning. The development of effective VLE and online instructional materials to satisfy the students' educational needs calls for the

correct utilisation of course design standards. The argument put up by Ally (2004) is that course delivery approaches that link learners' new knowledge to their old knowledge is required to obtain better experiences of the subject in a distance and online learning environment. This can only be achieved when we have effective delivery, facilitation,

assessment and support services in distance and online environments. This study contributes to the debates and provide a better understanding of how VLE influence self-efficacy.

The study thus has the potential to deepen conversations about opportunities to learn in the university especially through online. It will further assist teachers/tutors in effective customization of their knowledge of existing technologies in order to create opportunities for students to learn better. The study also provides effective strategies for resolving the challenges face with VLE and self-efficacy.

The use of digitals in education today has had undeniable advantages. According to Watts (2017), in a study carried out in the learning of foreign languages. It appears that the pedagogical use of Information and Communication Technologies increases the motivation of students to learn, but for this, the teacher by its quality as the main guarantor of the quality of education (Law N ° 98/004 of April 14, 1998, Article 37, Paragraph 1), must be able to use it in a didactic situation. To master its educational uses from digital, Karsenti and Ngamo (2009) define four (04) levels of use of ICT in pedagogy which they call dial. L'Teacher in his teaching obligation (Law N ° 98/004 of April 14, 1998, Article 39, Paragraph 1) must therefore seize all the advantages offered by the didactic tools present in its environment.

According to the author, educational software is a factor of interaction, of dialogue between learners and teachers. Koumene (2007) therefore maintains that the use of software makes it possible, among other things, to diversify the course materials; it also allows individualized learning over a limited time and allows skills to be gradually developed over the duration of the training. L' use of the number ic by students would have undeniable advantages on the academic performance of students, especially through his self-efficiency and his self-esteem (Raby , 2004). By several authors, the ICT offer several tools including software, tutorials, online learning platforms, interactive whiteboards, interactive tablets, digital workspaces, social networks, collaborative work development, smartphones, digital manuals , educational social networks, search engines etc.

Each of the above tools and services offers an undeniable educational advantage. According to Mohamed and Hassane (2012), these tools offer collaborative workspaces, laboratories, remote and virtual libraries. In addition, ICT provides a connection between

learning and real-life issues. Among other things, ICTs offer solutions to a number of problems encountered in schools, notably the insufficiency of textbooks and other teaching materials. Although elsewhere, the use of digital in general makes it possible to document, produce, communicate, train, experiment, induce new educational situations, According to Kiledjian (2006), we can distinguish 14 contributions digital technology on student learning.

Among these contributions, the author believes that the use of digitals, through educational software have an impact on the academic performance of students. In particular helping the student to develop various intellectual skills. The specificity of learning using new technologies, promotes the development of a spirit of research, facilitate collaboration extension between students, facilitate the integration and mastery of learning, facilitate information on new teaching resources and the availability of support for their use, and create new relationships by be teachers and students s (Petit Jean, 2016).

2. STATEMENT OF THE PROBLEM

It is generally believed that with the advent of Information and Communications Technology (ICT), virtual learning is among the catalysts that will drive learning. Hence, virtual learning should become an integral part of learning in tertiary institutions. Another rationale for virtual learning could be seen in the fact that the world of the twenty-first century can aptly be called an e-driven world-or virtual technologies have brought profound changes to all facets of life. In order to equip students with the necessary skills and knowledge to foster the growth of independent, creative and lifelong learners, schools should use virtual learning to provide relevant experiences to support and facilitate the students'' development.

Virtual learning has been described as an enabling process, which depends on learners'' awareness. Awareness refers to knowledge and understanding of the meaning, structure and content of any new technology, like the Internet. It also involves awareness of the potential benefits of using that technology. Awareness empowers people to participate in applying any new technology, designing new tools and having a meaningful role in society''s development and consequently, it provides a base for investigating the status of virtual learning among students in universities.

The researcher is motivated to investigate the awareness of virtual learning among university students in the University of Yaoundé 1for several reasons. One of the reasons is to be found in the social craft of learning theory. The social craft theory of learning was developed by Wenger (1998). Wenger described learning as a social craft that must be acquired and developed and he stated that the path of how schools should be places for social practices for learning takes a craft orientation to education. He noted that his theory is based on two fundamental crafts: (1) How to develop schools into places where learning (including meta-

learning) is their distinguishing perspective, and (2) How to cultivate dispositions, inclinations, and propensities or passions for learning. The basic tenet of Wenger's craft of learning theory is that schools and institutes of learning could and should be the specialists for the social craft of learning. They can be places where learners learn how to learn and where students are taught the crafts of reflecting, interpreting, and dialoguing on their personal epistemologies and ways of learning.

Relating this theory to the context of virtual learning, one can see that to acquire the social practice of learning, university students need to see themselves as free agents that can expect to continuously update their skills and knowledge from time to time, depending on their projection of the needs and drivers of the economy through virtual-learning. Another reason is that many students entered the 21st century with sole exposure to traditional lecture methods of teaching. Soyemi, Oguntuka and Soyemi (2012) remarked that many university lecturers principally teach through traditional lecturer-centered model. Despite the influx of virtual technologies, it appears that many educators do not see distant teaching as effective as traditional methods.

Studies have generally indicated that the use of traditional didactic lectures alone cannot make students to be globally literate and succeed in this information age (Ahmad, 2012; Ravitz, 2006; Wells, de Lange, & Fieger, 2008). As noted by Wallace, Martin, Yokohama & Schaik (2010), research in the informed use of technology for educational purposes highlights the need to go beyond replication of traditional, didactic practices to an appropriation of digital communication (Warschauer, 1999) facilitated by a constructivist pedagogy (Jonassen & Land, 2000) to support purposeful tasks (Martin & Vallance, 2008). New methods of effective teaching and learning, which meet the expectations of the diverse student body and which engage students, should be explored and implemented. Students need to be challenged to become engaged in the 21st century way: electronically. For any electronic learning technologies such as virtual learning to be effective, students must be aware of what it entails, be motivated and competent to use it.

However, due to difficulties of lack of ICT implementation in overcrowded classrooms; insufficient training, lack of learning support materials and support, curriculum overload, lack of clear planning and assessment, and severe pressure on lecturers to increase their research outputs, integration of virtual learning may not be a priority for lecturers (Oye et al., 2012).

There is need for students to use virtual learning to complement the efforts of the lecturers and classroom lectures. Goktas, Yildirim and Yildirim (2009) found that when students are motivated to engage in virtual learning, learning interests such students more because they see how acquiring practical skills and learning to solve problems contribute to future success. Teo (2008) also reported that virtual learning supports higher order thinking

the expansion of the Internet and the increasing popularity of social and collaborative computing, recently commonly called social computing, social networks have emerged as a significant and promising field of study within computer science. Social computing involves such activities as collecting, extracting, accessing, processing, computing, and visualizing of all kind of social information (King, 2010).

The continuously increasing popularity of the World Wide Web and the Internet caused that increasing number of types of services is available through a computer network. People who use these services have created a new kind of virtual societies usually called online social networks (Leskovec, Backstrom, Kumar and Tomkins, 2008). The main features that distinguish social networks on the Internet from the social networks extracted based on interactions between people in the real world are as follows:

- Lack of physical, in person contact – only by distance, sometimes very large distances.
- Usually the lack of unambiguous and reliable correlation between member's identity in the virtual community – internet identity and their identity in the real world.
- The possibility of multimodal communication, simultaneously with many members; also the possibility of easy switches between different communication channels, especially online and offline, e.g. online VoIP and offline text communication.
- The simplicity of a break up and suspension of contacts or relationships.
- The relatively high ease of gathering data about communication or common activities and its further processing.
- Potential lower reliability of the data about users available on the Internet. Users of internet services relatively frequently provide fake personal data due to privacy concerns (Leskovec, Backstrom, Kumar and Tomkins, 2008).

1.4. Synchronous collaboration tech

Harvy Singh (as cited in Piskurich, 2003) expressed that one of the most significant contributions of Internet based technologies toward learning in the last few years has been the introduction of synchronous collaboration technologies (often described as live e-Learning or virtual classrooms). Synchronous collaboration technologies truly create a new medium that brings facilitators and participants together in a dynamic and live environment through which highly interactive communication can occur – closing down the barriers for communication and learning. Harvey Singh further believed that today, Internet-based synchronous collaborative technologies create a multidimensional and multi-sensory environment for communication through voice, multimedia and interactivity – the right medium for learning and knowledge transfer. Horton (2006, p. 365) described that "unlike classroom setting, the size of an e-Learning class is not constrained by the physical architecture but by decisions of the course designer and the capabilities of collaboration technology." Allen (2006: xiv) explained that "synchronous learning events occur simultaneously for all learners as happens in classrooms when an instructor delivers a lecture.

Examples of synchronous learning include instructional uses of web conferencing, live chat rooms, instant messaging and virtual classrooms." Allen (2006, p. xiv) described that "Asynchronous learning as learning events that happens at different times for each learner, ideally when and as needed by each. Asynchronous learning includes self-paced courses, historically the most common form of e-Learning, as well as message boards, discussions forums, and mentoring through email." Bowman (White & Baker, 2003) explained that Synchronous courses are those in which students and professor are all online at the same time, usually in a chat room, and the professor teaches in real time on the computer.

Most synchronous learning is still conducted via text (typing on the computer) but, the trend is rapidly moving toward voice and even video chat on the computer. This makes learning in real time on the computer very similar to going to class. Students can hear, and sometimes see, the professor talk; view charts and graphics; and ask questions and participate in discussions with classmates during the class time. Bowman (White & Baker, 2003) explained that Asynchronous learning is by far the most popular and most widely used form of online learning. In asynchronous classes, students have weekly start and end dates, during which time they must complete specific assignments and discussions.

Harvey Singh (as cited in Piskurich,2003), described that thousands of organizations – business, academic, and governments are exploiting synchronous collaboration and live eLearning technologies successfully to revolutionize enterprise learning and demonstrating tremendous and immediate return on investment. Elliott Masie (as cited in Piskurich, 2003) explained that the idea of learning delivered via technology seems to logically take us to a more intensive and engaging experience. Simulations are being successfully developed for areas where they are particularly appropriate such as flight training, manufacturing skills, and even some IT labs.

But they cost significant amounts of money to develop and often have way too short of a shelf life or audience size to justify the expense; however, we are seeing more and more investment in the simulation model. Traditionally, the best learning environments provided an integrated mix of synchronous and asynchronous learning activities in combination with dynamic opportunities for collaboration with experts and peers. Well-designed e-Learning provides this type of environment, as it incorporates well-established teaching methodologies and proven educational philosophies, and enhances them with a rich mix of interactive media developed in response to rapid growth and changes in business, corporate training and the educational institutions.

1.5. Learning Management Systems (LMS)

The LMS proposal is an extensive set from the options and communication tools to service the lecturers and their students” interactions and implement daily activities that help improve the learning process. E-learning is electronically facilitated learning: This domain relates to the material of e-learning courses itself, rather than the electronic system, whereas it focuses on the material design of the e-books, CD-ROMs and Web sites, to assessment and electronic tests. Even though there are natural differences in all of those tools, they are all mediated electronically (Zemsky and Massy, 2004).

This thesis could give a brief definition for e-learning from the conclusion that most of the definitions imply, which focuses on the means of delivery, but not on the process of learning. Those definitions viewed e-learning in terms of its numerous delivery options, but missed the learning process situation. However, the definition put forward by the Council of the open and distance learning quality did not ignore the learning process situation; whereas

the definition was included the word created, in the sentence “effective learning process created...” means that the learning takes place. On the other hand, most the types of services and support tools could be provided in an e-learning system; whereas, the outcome may not be learning.

From this argument, e-learning may be named [e-education]; but it might not be defined as e-learning as the process of interaction with electronically mediated education materials; except or unless the learning takes place. Where there is a focus on the learning process rather than the meaning of delivery, this thesis is accepting the definition formed by Mason and Rennie since 2006, which is as follows: “the e-learning is the effective learning process created by combining digitally delivered content with (learning) support and services”. (Mason and Rennie, 2006, p.13-15)

1.6. The Joint Information Systems Committee (JISC)

It offered a parallel definition in 2003, defining e-learning as "learning facilitated and supported through using the information and communications technology (ICT)" (JISC, 2003). Likewise, Clark & Mayer (2003) have indicated that e-learning is the instruction delivered on a computer by way of CD-ROM, internet or intranet with the next qualities: containing content relevant to the learning objective; using instructional methods which include the examples and practice to support learning; using the media elements for example words and pictures to transport and deliver the contents and methods also, building fresh knowledge and skills linked to individual learning goals or to improved organizational performance. Clark & Mayer (2003) Stockley (2005) has defined e-learning as “the delivery method of a learning, training or education program by electronic means, e-learning is involving the usage of a computer or electronic device (e.g. a mobile phone) to provide training, or learning material”. (Stockley, 2005).

Also, Oblinger and Hawkins (2005) suggest that e-learning has transformed from being a completely online course to use technology to deliver selected parts or all of course, independent of a fixed place or time. This means that students can be domestic, traveling or can learn at any distance (Oblinger and Hawkins, 2005). Nevertheless, there are differences of view regarding the definition of e-learning from other professionals working in this field, such as Dublin & Cross (2003) and Oblinger and Hawkins (2005) who demand that there is no definition accepted by all researchers. In the opinion of Oblinger and Hawkins, "everybody

knows what you mean when you talk about e-Learning: however, the term e-learning means different things to different people" (Oblinger & Hawkins, 2005). Also, Heinze and Procter and Zemsky & Massy in 2004 addressed the same point, adding, "Yet, the e-learning is a concept in search of consistent definition". They argued that it is difficult to find a commonly accepted definition of e-learning (Zemsky and Massy (2004).

1.7. Instructional materials for e-learning

In summary, new technologies, including computer networks, interactive-media, digital technologies, and the internet significantly increase the reach of e-learning provision. It enables and allows students to connect and interact with each other, and with their teachers, at any time, and it has opened up a universal market. Thus, many institutions have been attracted to e-learning systems and the e-learning market has grown continuously (Harun, 2001). In

2003, industry analysts situated the size of the e-learning market at 3 billion USD in the United States alone; the number grew to almost 15 billion USD by 2005, 18 billion USD in 2010, and it is expected to reach 24 billion USD by 2015 (Adkins, 2013). Carayannis (2015) described the advantages of using e-learning systems in modern educational institutions. ELearning, in comparison with traditional learning, significantly reduces the time needed to locate information.

It also offers access to online resources, databases, periodicals, journals and other material. If a student has trouble understanding part of the coursework, finding tips on the matter couldn't be easier than having immediate access to supplementary, unlimited and mostly free material online. Those characteristics can potentially maximize the time spent actually learning rather than looking for information; this is the first benefit from the elearning. Also, there are numerous benefits such as the cost of training; the speed to use the education packages faster without waiting for a training representative.

Also, can provide feedback on training immediately. This suggests that e-learning offers a wide range of opportunities that need exploring and thus the proposition is that elearning can be defined through three broad domains : E-learning is a distance education method: Most of the authors working in this field have accepted that the conceptual idea of the term e-learning indicates distance education or education delivered online. E-learning is

transactions facility on the web: Some writers have highlighted that the facilities offered via the Learning Management Systems (LMS) exemplify a second e-learning big success.

Typology of Digital Tools: De vrie (2001, p. 105), Petitjean (2016) and Mboulou (2019)

De vrie (2001) in his work established a typology of educational software and their educational functions. These software are summarized in the following table.

Pedagogical function	Types of software	Theories	Activities	Knowlegde
Present informations	Tutorial	Cognitivism	Read	Présentation ordonnée
Give exercises	Repeated exercise	Behaviorism	Do exercises	Association
Teaching process	Tuteurs intelligents	Cognitivism	Dialogue/discussion	Représentations
Have the learners attention and motivation	Educative guide	Behaviorism	Games	
Break for Brainstorming	Hyper medias	Cognitivism/constructivism	Explorer	Present acces
Provide a conducive environment for natural laws	Simulators	Constructivism/cognition	Manipulate/observation	Modelization
Provide a conducive environment for discovery and abstract domains	Micro world	Constructivism	Construct knowlegde	Materialization
Provide space for exchange between students.	Collaborative learning	Situated cognition	Discuss	Construction of learners guide.

Petitjean (2016) in his work entitled: integrate ICTs into teaching practices, established a directory of computer tools and subsequently shows their pedagogical importance for both the teacher and the learner. For this, the author starts from the observation that we cannot stop evolution even less living on the fringes of this development. Regarding digital, Petitjean (2016) also thinks that we cannot stop the evolution of digital. For him, it is just necessary to tie in with it. To better understand the author's thinking, he draws on Siemens' Theory of Connectivism, which is a theory of learning in the digital age. For whom, technologies are changing the way we think by modifying what he calls "Brain Wiring". The author also shows that the teacher has once again become a digital learner as we have moved from oral transmission to teaching through books and now to digital learning.

To define the acronym TICE, Petitjean (2016) classifies ICT tools into several groups. The first group is that of soft wares: which includes word processing software, image, sound and video processing software, tutorials, computer applications, platforms, etc. The second group is that of hardware tools: which includes computers, video projectors, TNIs, Internet, cameras, keyboard-mice, tablets, scanners, smartphones, etc. The third group is the database: in this group the author places educational websites, digital books ... The fourth group is that of digital textbooks. The author then presents the advantages of ICT tools first for the teacher and then for the student. For the teacher, ICT promotes helps: Promote teamwork, Develop autonomy, and Develop creativity, Update your knowledge less papers, and Find other resources, Mutualise. For the pupil, the ICT allows to: Develop autonomy, Communicate differently Develop interactivity, attractiveness and curiosity Develop motivation Promotes discovery Subsequently, Petitjean (2016) will present the contribution of ICT in the act of teaching.

Based on the work of Marcel Lebrun, that Technologies can be a factor of dialogue between the poles of the "Teacher-Learners-Knowledge" triangle. Therefore, by using ICT, the teacher adopts the posture of an accompanist, a guide, a facilitator. He teaches the student to learn. The student at this time is the actor in the learning process and he uses the tools as a means and methods offered for self-training, for self-learning. In pedagogy, the author classifies the role of Technologies, in particular by considering several poles: Knowledge in ICTs are used to store information, expand sources, and make it easier to find, write and read multimedia resources. Teach: offer digital lessons, exercises and assessments on an ongoing basis. Train: allow communication by offering a synchronous and asynchronous framework for exchanges. Learn: Provide models, work on data, formalize in a clean way, discuss, and

look at the work of others. Education is centralize both on knowledge and communication between actors, allow the circulation of information and the provision, capitalization of resources.

The pedagogical use of ICTs tools refers to a use that is digital, this pedagogical integration corresponds according to legend (1993), to "(...) make various elements interact in order to constitute a harmonious whole and of a higher level". Based on this understanding of the pedagogical integration of ICT tools, the author establishes a typology of digital tools, which he classifies into two groups. On the one hand, digital software tools and digital hardware tools. among hardware tools, the author classifies computers, tactile artifacts, smart phones, servers, digital cameras, webcams, scanners, video projectors, CD-ROM players, dvd players, burners, printers, modems, smart tv, tbi, kit of educational robot.

Software tools, it identifies: softwares educational , software or office applications, mobile applications, social networks, digital workspaces, web2.0 applications, etc. the work of de vries (2001) allow to identify eight types of educational software especially tutorials, tutorials, animated videos, exercisers, tutors intelligent, serious games, hypermedia, simulators, micro worlds, and collaborators. With regard to the educational integration of digital tools, Mbouilou (2019) distinguishes between physical integration and educational integration. The physical integration corresponds at the provision of a set of technological equipment available to teachers and students, to get them to use it occasionally in order to meet the specific educational demands of the environment (raby, 2004).

Furthermore, according to (Dias, 1999; Hadley, 1993; Parks, 1994; Depover, 1996) "Physical integration is characterized by the acquisition of digital tools (hardware or software) necessary for teaching and learning, and their handling for personal use or professional. Educational integration is characterized by the implementation of digital tools, on a continuous basis, to support and further develop the objectives of the program and to engage students in meaningful learning".

1.8. Technology and motivation

Technology and Motivation Educators and learning leaders do not have enough dialogue about motivation when addressing technology supported learning environments (Mayer, 2011). Educational technology tools and technology supported learning environments impacted motivation because they can be customized to allow learners to do activities that elicit motivation (Mayer, 2011). This is very important because motivation is not static or one

dimensional but highly contextual and multifaceted (Hartnett et al., 2011). Technology-based learning environments have the capacity to deliver learning that provides learners with challenge, curiosity, control, and fantasy (Schunk, Meece, & Pintrich, 2014). Technologybased learning environments can also create a burden on some learners and teachers who have to use extra cognitive skills to learn the technology. This could result in learners and instructors being apprehensive about engaging with the technology. Additionally, instructional time and learning can be adversely impacted when technical issues occur with the technology (Rodriquez et al., 2016).

Learning environments that provide challenge, curiosity, control, and fantasy promote intrinsic motivation in learners (Schrunk et al., 2014). Therefore, educators should highly consider these variables when designing learning activities and learning environments. The four sources: challenge, curiosity, control, and fantasy introduced by Schunk et al. (2014) are similar to the ARCS Model introduced by Keller (2010).

Learning activities that are created to provide challenge, curiosity, and fantasy help learners to maintain attention. Learning activities that are developed to provide learners with control help students to develop and maintain confidence and self-efficacy. When learning activities are created with the appropriate degree of challenge it can help maintain learners' attention and provide learners with confidence. The literature on learning motivation firmly supports the notion that educators should design learning activities and learning environments with the appropriate characteristics that will promote motivation.

The responsibility for this lies with educators (Keller, 2010). Motivation and collaboration are also key factors to entertain when using VLEs to educate learners (Haverila, 2012). VLEs impacts learners' motivation because of the control they afford learners in these environments (Sansone et al., 2011). For example, VLEs afforded learners with the flexibility to interact with their learning content, learning resources, instructors, and other learners in any manner that they choose. However, there is still a need for research on how technology influences collaboration and interaction in computer based learning environments because the outcome from collaboration and interaction between individuals and groups is not consistent when technologies are used (Blake & Scanlon, 2013).

1.9 . The blend between VLE and learners

In order for learners to be successful using VLEs the technology has to be able to support the learner in accomplishing their learning tasks. The technological make up of a system can dictate how learners use the system or how they will be motivated to use the system in the future (Mohr et al., 2012). Learner characteristics and self-efficacy must be taken into considerations when matching technology characteristics for a learning system. Both will determine the level of engagement and the satisfaction level that learners will have with the system (Yu & Yu, 2010). Technology fit exists when there is a match between the technology and the learner's characteristics (Yu & Yu, 2010). Learners obtain optimal performance when the technology fit compliments their learning needs (Yu & Yu, 2010). Technological functionalities, technology fit, and perceived usefulness by the learner influenced their attitudes and perceptions for using technology. All of these factors can ultimately influenced motivation (Yu & Yu, 2010; Mohr et al., 2012).

Research on perceived usefulness showed that there was a high correlation between perceived usefulness and utilization (Mohr et al., 2012). When learners had a positive perception of the usefulness of the technology they were motivated to use the technology (Mohr et al., 2012). Additionally, when learners were provided with the technology that fit their learning orientation they were motivated to used it more (Yu & Yu, 2010; Mohr et al., 2012). The higher the perceived usefulness is for the learner and the greater the technology match is with the learner the higher the motivation and utilization for the technology will be. This implies that the more educators know about their learners' attitudes, learning styles, and preferences, the better inform they would be when making decisions for the selection and design of educational technology (Mohr et al., 2012). The learning environment and delivery platforms for learning have to fulfil the expectations of learners in order for them to want to engage in the learning environment (Mohr et al., 2012).

This argument supports Mogus et al.'s (2012) research on the technology acceptance model. The technology acceptance model holds the view that in order for learners to become motivated to use new technology they must be convinced that the technology has the capacity to allow them to perform the same tasks that they were performing using the old technology (Mogus et al., 2012). Celik and Yesilyurt's (2013) research used a computer anxiety scale and an attitude scale to evaluate learners' attitude toward technology supported learning

environments. Celik and Yesilyurt's research showed learners' attitudes and their self-efficacy toward computer technology affected their usage of technology-supported environments. Celik and Yesilyurt further explained the importance of teachers' attitudes towards using technology.

1.10. E-learning as an educational outcome

E-learning is one of the educational outcomes that have surfaced from the development of ICT. Its general concept is essentially learning which involves the usage of any electronic device, from computers to mobile phones, and which might, or might not, involve the usage of the internet (Web sites+ other applications) or an intranet (Local network system). E-learning could be presented through several resources, for example: computer software and internet websites. Moreover, other applications have been developed specifically for e-learning, such as Virtual Learning Environments (VLEs), which provide the user or the learner with numerous facilities like comfortable access to learning materials, communication with lecturers or trainers and the other peers.

The VLE provides flexible access to learning, as it can be accessed anywhere and anytime (Adam & Healy, 2000). There are many authors who have a positive view of e-learning. One such example is Rutenbur et al, who describe e-learning as "the use of networked technology that will make the revolution possible". Rutenbur et al further argue that e-learning will play a critical role in changing the way we work and live. Rustenburg et al (2000). However, some other studies provided the following declarations to describe and identify the idea of e- Learning. The European Commission (2001) describes e-learning as: "The usage of new multimedia technologies and the Internet to develop the quality of learning and teaching by easing access to facilities and services in addition to remote exchanges and collaboration" (The European Commission, 2001).

1.11. Financing e-learning

VLEs are costly to develop and maintain in terms of time and budget. Considering that many features of VLEs may not be as useful to learners as designers. The VLEs can be made more efficient by taking into account how their users perceive them, and in connection with that by identifying the features of VLEs that are most useful to the users; this most uses features can better be identify by the learners themselves taking into consideration their benefits and satisfaction. VLEs are costly to develop and maintain in terms of time and budget. Considering

that many features of VLEs may not be as useful to learners as designers. The VLEs can be made more efficient by taking into account how their users perceive them, and in connection with that by identifying the features of VLEs that are most useful to the users; this most uses features can better be identify by the learners themselves taking into consideration their benefits and satisfaction.

Education and Learning have always been vital ingredients of any civilization, and remain more so today. "Classroom training is a 19th-century artifact - if not an artifact of the medieval times," said former U.S. Dept. of Labour Secretary Robert Reich, cited MiachaelVerespei in his article "Click and Learn" (Industry Week, 2001). Similarly, while explaining limitations of the current medium of education, Peter Cochrane, head of Research, BT Laboratories, in his article *The Global Grid of Chaos* (as cited in Leer, 2009, pp. 74-75), explained that "given an assignment, their (student) search routine is Compact Disk (CD), the Web, and book. The reason, it is fast, efficient and low cost. Books are expensive, unavailable and slow. They can also be a dead medium, lacking any animation or interaction." Collins and Meeuwsen (as cited in French et al., 1999) indicated that when students use the World Wide Web for a learning environment, they suddenly have the world at their fingertips. People and resources from all over the world can be at a student's computer at the click of a search engine.

The learning opportunities are enormous. E-Learning is changing the learning landscape. Its blend of technologies, interactivity and just-in-time delivery means big savings. E-Learning is now part of how we do things and it provides learning options on an as-needed basis. Many universities, governments and non-profit organizations have started to follow the pathway led by corporations in reaping the benefits of e-Learning with its ability to successfully connect learners and the subject matter experts from around the world. The need for less expensive and effective ways to deliver knowledge has led to explore the option of eLearning. The convenience that e-Learning offers to the users such as being able to take courses at their own pace, at their own place and the engaging nature of the multimedia delivery has been drawing better participation.

The centralized nature of web-delivered materials makes the content and delivery of the course standardized for all users, irrespective of their location or time zones. The web has become a medium where learning communities and new practices can form and evolve (Svensson, 2002). Long (as cited in Piskurich, 2004) articulated that e-Learning has been

hailed as the greatest development in learning since the printing press. Through e-Learning, a community of learners can be established via digital communication networks. As in a real school, discussion will take place on a specific task, about the course in general or larger issues, though not sitting in the same physical classroom.

1.12. Classification of E-Learning platforms, their advantages and disadvantages and preference

E-learning platforms are the modern digital substitutes of the traditional classroom. They are the place where your e-learning course is hosted and allow you to share and upload files, videos, chat with the participants, grade their work, etc. The e-learning platforms are divided into three types: learning management systems, social media, and conferencing software. Schools and companies usually use a mixture of the three for their online courses.

Learning management systems (LMS) are the most preferred option due to the numerous features and opportunities they provide. We can compare them to virtual classrooms where students learn through lectures or discussions, receive tasks, submit papers, and get grades. LMS allow the sharing of videos, audio, slideshows, PDF files, etc. They are a suitable media for readings, activities and even quizzes. There can be an instructor or facilitator who runs the course but it is also possible for participants to do the separate modules alone at a time that suits them best. The best thing about LMS is that training can be done at any time and on any device and therefore, are preferred by companies, educational institutions and private learning providers.

LMS can be web-based or hosted locally. Some of the best cloud-based LMS are Adobe Captivate Prime, Docebo LMS, Talent LMS, the academy LMS, and ExpertusOne. Some of the open-source LMS feature Moodle, Eliademy, and Forma.LMS, which are free of charge and some of them have paid premium options with more features.

The social media platforms offer chat rooms and support online learning communities. A teacher can establish a group on Facebook, for example, where they can ask questions or assign tasks and the learners provide their answers and interact with one another. Multimedia can be used with these platforms and learning can take place at any time and on any device. The main disadvantage is that there is no way to track and analyse the effectiveness of the training.

The web conference software, which is the third type of e-learning platforms, allows online conference calls, videoconferences, webinars, live chats, and classes. The teaching process is done in real time and allows higher participation and engagement. It is suitable for smaller groups and even individual training. Since it is live, however, it is not appropriate for learners who are located in different time zones. In summary, we can say that a successful elearning platform contains all the necessary elements for efficient learning such as the possibility to exchange different file types, track the learning progress, grade the assigned tasks, interact with all the participants, and be affordable in terms of pricing.

Below, we shall classify some e-learning platforms, bringing out their advantages and disadvantages and preferences amongst students and teachers. The platforms are classified into three categories a) Online learning platforms, b) Online course platforms and c) learning management systems.

1.13.1: Online learning platforms

i) LinkedIn Learning (Lynda)

LinkedIn Learning which was formerly Lynda.com, is an educational platform that offers professional courses on business, technology-related and creative fields in the format of video lessons. The platform comes as a premium service for LinkedIn users and offers more than 16,000 courses in 7 languages and focuses on helping individuals invest in their professional development.

Pros:

- It is highly recognizable and valued in the B2B community.
- It comes with a one-month free trial.
- It provides personalized course recommendations for users.
- It offers certification upon course completion.
- It allows you to assess your progress using quizzes.
- It has offline learning access to learn on the go.
- It grants you access to other premium career features

Cons:

- The quality of the courses it offers is ambiguous and you need to conduct some research into them before enrolling.
- Joining as an instructor may be challenging.

Preference

- Students: It is mostly suited for professionals and businesses looking to train their employees
- Instructors: Apart from individual learners, business teams, universities, and government organizations can use the platform for educational and training purposes.

ii) Udemy

Udemy is one of the most popular online course marketplaces on the web. This educational platform has more than 40 million students and 50 thousand instructors and subject matter experts creating online courses. Udemy makes course creation possible for everyone with the possibility of acquiring new skills. In doing so, it offers a range of online learning materials including PDF documents, PowerPoint, text, and video content amongst many others. It is open to instructors to join Udemy and start teaching online, but it takes a huge piece of the pie from the revenue and has control over pricing and discounting the course.

Pros:

- There is no setup cost. (for instructors)
- It is geared towards self-paced learning and video courses.
- There is no need for highly technical knowledge.
- There is an Udemy app available for iOS and Android.

Cons:

- There is very limited interaction with students. (both for students and instructors)
- There is high competition between course creators. (for instructors)

- There is no possibility of personal branding. (for instructors)
- It has control over prices and often sells courses for incredibly low prices. (for instructors)
- There is no data ownership or control over branding – It keeps emails, user data, and does not share this information with their instructors. (for instructors)
- Visibility depends on your own marketing; the platform only promotes courses that are already popular. (for instructors)

Preference

Students: Udemy has a course for almost every discipline, but always read the reviews before buying one. Quality is not consistent.

Instructors: It's great for teachers, instructors, educators, and freelancers who are just starting out.

iii) Coursera

Coursera is an online education platform with 23 million users that is dedicated to offering high-quality online training courses worldwide. While partnering with world-class universities and businesses, it provides students the opportunity to receive certifications from renowned institutions upon joining their paid courses. Coursera offers individual courses, specialized courses, and degree programs that support on-demand video lectures, homework exercises, peer-reviewed assignments, and community discussion forums.

Pros:

- It offers a variety of learning options and activities.
- It awards students with different types of certificates and degrees.
- It offers high-quality educational tools and instructor interactions. (for instructors)

Cons:

- It is limited to educators in partner institutions. (for instructors)

- Its course creation options are less flexible compared to other platforms. (for instructors)

Preference

Students: Anyone who wants to learn from prestigious institutions, whether they are looking for a one-off course, a certification or online degree.

Instructors: It is aimed for professors who are based at a HE partner institution or business.

iv) Skillshare

Skillshare is another popular course marketplace that has more than 4 million students and up to 24,000 lessons in various disciplines. Course lessons last from 20 to 60 minutes and are made out of a series of small videos, class projects, and a student community that encourages interaction through discussion forums. Classes are divided into 4 categories:

- **Creative arts:** from graphic design to fine art, cooking, and music production.
- **Technology:** including data science, web design, and e-commerce.
- **Business:** finance, accounting, project management.
- **Lifestyle:** teaching, languages, gaming, and wellness.

Pros:

- It offers a supportive discussion forum where students exchange feedback.
- It provides the ability to take many courses for the same price.

Cons:

- Its class content is limited to only four categories.
- There is no certificate of completion or any other formal recognition.

Preference

Students: It is suitable for students interested in the creative arts, technology, business and lifestyle classes as mentioned above.

Instructors: It's great for instructors who are in the creative field and want to make a side income. Instructors can make money through Skillshare's royalty system and their referral program.

v) edX & Open edX

EdX.org (course marketplace) and Open-edX are two sides of the same coin. EdX is the learning platform where students find online courses from various universities and OpenedX is an open-source content management system. They were created by a team of scientists from Harvard University and MIT with the goal to provide online university-level education across the globe.

EdX.org has powered more than 8,000 online courses from 100 prestigious universities and businesses that are currently offering higher education in many disciplines. They mainly specialize in the sciences – engineering, computer science, data science, math, humanities, business, and management.

Pros:

- It is free and open-source. (for instructors)
- It has an app that is available on iOS and Android.
- Its online classes are interactive, allowing students to chip in.

Cons:

- Its discussion forums seem to be outdated and difficult to navigate.
- It requires technical knowledge or hiring a developer/web-designer to implement. (for instructors)

- It comes with the additional costs of a self-hosted server and its maintenance. (for instructors)

Preference

Students: EdX has a very diverse library of courses suitable for most ages looking to learn a subject or new skills.

Instructors: (Open-edX): It's great for businesses who can afford a team or outsource the development and maintenance of the platform in their own servers

1.13.2: Online Course platforms

i) LearnWorlds

LearnWorlds is our very own cloud-based platform that comes as an all-in-one solution offering the ability to build your online academy while creating unique, interactive, and social learning experiences. Our platform brings everything you need in one place, making the process of creating online courses easy and affordable at the same time. On top of that, it's designed to give you the right marketing tools to help you promote and sell online courses.

Pros:

- It is very easy to set up and create courses.
- It does not require any technical skills to use.
- It comes with built-in course authoring capabilities.
- It offers a modern and customizable course player.
- It offers a state of the art website builder.
- It has built-in e-commerce, marketing, and affiliate features.
- It includes a variety of learning tools & assessment engines.
- It offers a robust prerequisites system.
- It comes with a built-in online community and discussion.

- It supports SCORM and HTML5 files.
- It offers a responsive 24/7 customer support with onboarding for new customers.

Cons:

- It has no pre-built sales funnels.
- It has limited gamification options (badges only).
- It does not support TinCan.
- It offers limited email marketing capabilities.

Learn Worlds also comes with the most powerful website builder for elearning sites, with website, page and zone templates, fully customizable branding, controlling who sees which zones/pages and controlling the navigation experience of the users.

Preference

It's ideal for entrepreneurs, individual instructors, educators, small/medium businesses, professional trainers, and internal training for companies that want to train their employees.

ii) Thinkific

Thinkific is a standalone course platform that helps you sell online courses. Thinkific provides everything you need to create your online education business including an easy-to-use interface to build courses and rich multimedia to add right into your course content.

Pros:

- It includes a landing page builder.
- It offers built-in sales and marketing tools.

- It has various integrations with popular software.
- It is a cloud-hosted platform you can connect your domain with.
- It has a white-label option.
- It has 24/7 support.

Cons:

- It offers limited control over website design.
- It can be difficult to build complex courses.
- It does not support SCORM, TinCan, or AICC.
- It doesn't include social features.
- It focuses more on sales features rather than learning.

Preference

It's ideal for solopreneurs, small/medium businesses – SMEs, and coaches.

iii) Teachable

Teachable is an online teaching platform that serves the everyday instructor. Teachable provides an easy and simple solution for uploading your learning content, customizing your online school, and communicating effectively with your students.

Pros:

- It has a simple and easy-to-use course authoring with quiz capabilities.
- It has a landing page editor and blogging capabilities.
- It comes with built-in eCommerce features.
- It includes built-in affiliate, marketing, and sales tools.
- It comes with a built-in email marketing tool.

- It offers an app that is common to all schools.

Cons:

- Its learning/teaching and assessment capabilities are limited.
- It does not support SCORM or TinCan.
- It offers limited customization options on landing pages and branding.
- It has no social or community building features.
- Its customer support is not very responsive.
- It has limited white-labeling options. e.g.sign ins and emails cannot be white-labeled.

Preference

It's a great option for new course creators, solopreneurs, coaches, and creative professionals.

iv)Kajabi

Kajabi is an all-in-one online platform that offers the tools to sell digital products, including online courses. Kajabi specializes in building high-converting sales pages, landing pages, webinar pages for your online business, and launching your advertising campaigns.

Pros:

- It comes with built-in email and marketing tools.
- It offers various integrations with popular software.
- It provides sales pipelines/funnels building capabilities.
- It offers a collection of beautiful themes.
- It allows the creation of landing pages.

Cons:

- It can be difficult to set-up.
- It has expensive pricing options.
- It offers limited control over website design.
- It doesn't offer many learning features and focuses more on small digital product sales.

Preference

It is for non-techy online course creators, digital entrepreneurs, small businesses, freelancers, creators, and individual instructors selling simple format courses and downloadables.

v) Podia

Podia is an online learning platform that makes creating and selling online courses, memberships, and other digital products an easy task. Podia offers a rich resources library and free tools for entrepreneurs who want to build their online store, school, or website.

Pros:

- It is very easy and simple to use
- It has sales page customization options.
- It offers affiliate marketing options within the platform.
- It allows you to have your own membership subscription.

Cons:

- It doesn't offer a community area on the platform.
- It lacks learning tools like grading, assessment/assignments, and certificates.
- It does not support SCORM or TinCan.
- It is very limited in its capabilities, suiting smaller video-based learning, coaching and downloadables only.

- There are no white-label options.

Preference

It's great for content creators and artists who want to monetize their content and knowledge with simple learning activities and gated video.

vi) WizIQ

WizIQ is a cloud-based education platform for real-time or self-paced training using your own custom-branded domain. It delivers live and on-demand webinars and it's a very popular tool amongst online course creators who prefer live training, coaching, or a classroom-like feeling.

Pros:

- It offers eLearning reporting and analytics.
- It provides the opportunity to teach in a virtual classroom.
- It has a mobile app (mLearning) that is available on Apple and Android
- It comes with course authoring with test and assessment capabilities.
- It has ecommerce features.
- It offers a white label option.

Cons:

- It does not support SCORM or TinCan.
- There are no gamification options.
- Its customer support representatives are difficult to reach after setup (based on online reviews).

Preference

It's ideal for enterprise employees, individual teachers, trainers, colleges, universities, tutoring, and Test-Prep companies.

vii) Academy of Mine

Academy Of Mine is an all-in-one platform that empowers you to create and sell your courses in professional training, continuing education and certification. With this platform you can customize existing features or build new features via API. You can craft interactive content with PPT, PDF, video and more.

Pros:

- It supports SCORM.
- Its support team is very responsive.
- It comes with a flexible website builder.

Cons:

- It needs a lot of work to customize the site.
- It only offers a few video guides to help you learn how to work with the platform.
- Its price is very high.

Preference

It's ideal for academics, large enterprises, public administrations and small/medium businesses interested in offering training and certifications.

1.13.3: Learning management systems

i) Docebo

Docebo comes with a top cloud-based LMS solution that ticks off the majority of every organization's training needs and requirements. The platform is learner-centric and comes with L&D capabilities using learning-specific Artificial Intelligence (AI) algorithms, that help to personalize the learning experience. Docebo is trusted by notable companies including Bloomberg and Sharp.

Pros:

- It is compatible with SCORM 1.2, AICC and Tin Can API.
- It has engaging gamification and social learning capabilities.
- It offers instructor-led training (ILT) features.
- It supports more than 30 languages.
- It allows third-party integrations with video-conferencing tools and other applications.
- It provides the possibility to offer certificates and sell online courses – ecommerce.

Cons:

- It doesn't offer customizable or advanced reporting capabilities.
- It has limited functionality on certain objects of the LMS that require richer API.
- It doesn't come with enough features on its standard package that would better suit small and medium-sized businesses.

Preference

It's aimed for use by human resource professionals, HR departments or enterprises.

ii) LearnUpon

LearnUpon is another great cloud-based option intended for educational corporate, customer and partner training. This platform is well-known for its functionalities, userfriendly interface and the multilingual support it offers. Its ability to segment different teams and create unique learning paths is one of the advantages it offers. LearnUpon is trusted by TripAdvisor and Booking.com.

Pros:

- It has great gamification options.
- It comes with eCommerce functionality.
- It is compatible with SCORM and xAPI/Tin Can API.
- It offers third-party integrations with key business tools.
- It offers the ability to support multiple audiences in one system using multiple portals.
- It supports blended learning methods – ILT, webinars, PowerPoint presentations etc.

Cons:

- Its pricing is expensive compared to others.
- It doesn't offer an option for HTML5 courses.

Preference

It's ideal for educational institutions and businesses of all types and sizes.

iii) SAP Litmos

SAP Litmos is a well-known platform that offers a variety of elearning solutions for businesses including corporate, customer, partner, services and support training, and compliance training. Amongst its bigger strengths is the ability to create customized learning paths for the needs and the style of every company and its employees.

Pros:

- It has an intuitive course builder.
- It is compatible with SCORM, AICC, xAPI/Tin Can API.
- It offers built-in reporting, dashboards, and communication functionalities.
- It comes with eCommerce and third-party integrations.
- It provides ILT and virtual classroom capabilities.
- It has a content library with 2,500 ready-made courses and videos.

Cons:

- It has limited customization options.
- Its interface isn't as appealing as others.
- It may be an expensive option depending on your business requirements.
- Its assessment and feedback delivery process is slower than usual.
- It lacks a dedicated payment gateway connection.

Preference

It's great for businesses of all types and sizes.

iv) iSpring Learn

As another great LMS option, iSpring Learn can be integrated in the corporate training program of any business. Because of the large variety of pricing plans and standalone tools it offers, an organization has the ability to choose what fits with their learning needs and budget the most.

iSpring is the cheapest option for smaller businesses but is not as feature-rich as the other LMS in this category.

Pros:

- It has unlimited file storage.
- It comes with a course template library.
- It comes with rich gamification features.
- It provides analytical and real-time reporting.
- It is compatible with SCORM, AICC and xAPI/Tin Can API.
- It offers an integrated authoring tool that offers blended learning capabilities.
- It allows mobile and offline access for a more convenient learning experience.
- It uses an automated course management tool that makes administrative tasks easier.

Cons:

-
- It has limited design customization and branding options.
- It has limited e-commerce capabilities.

Preference

It's suitable for organizations of all types and sizes.

v) Blackboard

Blackboard is an LMS solution that offers an adaptable learning environment that is suitable for both academic and business development purposes. As a learning platform, it provides a range of social and blended learning features that can make any type of training engaging throughout its course.

Pros:

- It comes with a mobile app (iOS and Android).
- It is compatible with SCORM, AICC, IMS LTI and xAPI/Tin Can API.
- It offers the ability to categorize users by different metrics e.g. skills and department.
- It integrates with social channels and video conferencing tools.

Cons:

- It has limited reporting capabilities.
- It has limited gamification options.
- It doesn't have any security enhancing features.

Preference

It fits well with the requirements of educational institutes, public administrations, educators, trainers, instructional designers, as well as SMEs and enterprises.

vi) Moodle

Unlike the majority of LMSs, Moodle is a free, open-source learning management platform. Moodle was designed by a group of developers and includes a range of drag-and-drop tools and useful resources that can help the everyday user. The platform is translated to over 95 languages and powers learning environments worldwide.

Pros:

- It has a desktop and mobile app (iOS and Android).
- It is compatible with SCORM, AICC, IMS LTI, and xAPI/Tin Can API.
- It offers a variety of customization options and integrations to plugins and add-ons.
- It gives you access to a community of developers, users and certified partners that share best practices on the use of the platform.

Cons:

- It doesn't offer an email or 24/7 support.
- It has limited gamification options.
- It can be expensive if you are hosting the solution but don't have an in-house IT team.
- Its setup can be tricky and time-consuming through the help of a certified Moodle partner.
- Its consultation services may come with an additional fee.

Preference

It's suitable for educators, freelancers, businesses, and public administrations.

2. THE CONCEPT OF SELF-EFFICACY

Self-efficacy is the belief in one's capabilities to organize and execute the requisite actions required to produce particular results [1]. Beliefs about self-efficacy determine level of motivation as reflected in the amount of effort exerted in an endeavour and the length of time devoted to a challenging situation [2]. If persons have a low level of self-efficacy toward a task, they are less likely to exert effort and accomplish the task. Research findings have demonstrated that self-efficacy is a better predictor of academic achievement than other cognitive or affective processes [3].

Therefore, self-efficacy is critical to learning and performance. Self-efficacy is the key to success in all activities including online learning. Hence, the understanding of the source of self-efficacy in online learning context is important. As found in this systematic review, many researchers focused on the investigation of various factors that influenced learner self-efficacy in online learning context. These various factors were source of self-efficacy in online learning context as follows: online learning experience and knowledge, feedback and reward, online communication and interactions, social influence, and learner motivation and attitude. Moreover, the results of this review can be guidance in further research for design online learning to enhance self-efficacy of learner.

2.1. Efficacy believes

Efficacy beliefs can influence individuals to become committed to achieve their desired outcomes successfully. People who have high confidence with their capabilities are considered to have a strong sense of efficacy. They don't take difficult tasks as obstacles to avoid, but instead they take it as a challenge to develop their skills. They set challenging goals for themselves and they commit to them; and they quickly recover their sense of efficacy if they failed in a task. As a result, the level of stress and anxiety is reduced; and the amount of personal accomplishments is enhanced (Bandura, 1997).

In the other hand, people who have doubts with their capabilities try to avoid difficult tasks because it can be a threat to them, and those people are considered to have low felt efficacy. Bandura (1994) described those people after facing a difficult task, “they dwell on their personal deficiencies, on the obstacles they will encounter, and all kinds of adverse outcomes rather than concentrate on how to perform successfully” (p. 2). They quickly give up when facing difficulties; and they slowly recover their sense of efficacy if they failed in a task. They are considered as “victims” to stress and depression (Bandura, 1997).

2.2. Self-efficacy people's beliefs

Self - Efficacy People's beliefs about their abilities in particular domains are thought to be important in motivating them to do what they can do to achieve (Hawthorne, 2004). The three aspects that have received the most attention in research are: (a) self-efficacy - defined as confidence in one's abilities to successfully perform a particular task; (b) outcome expectancy - defined as beliefs that a particular behaviour will result in particular outcomes; and (c) causal attributions - defined as one's judgments about what causes success or failure to perform tasks (Shell, Bruning, & Colvin, 1995).

Only self-efficacy will be discussed in this study in relationship to student's academic achievement. Bandura (1997) introduces the concept of self-efficacy as a key component in social cognitive theory in the late 1970s and it has been found to be an important predictor of student achievement (Zimmerman, 2000). One of the major components of Bandura's (1986) social cognitive theory is self-efficacy. To Pajares (1996) this self-efficacy and other expectancy beliefs share some similar characteristics because they are beliefs about one's perceived capacity; but they differ in that self-efficacy is defined in terms of individuals'

perceived capabilities to attain designated types of performance and achieve specific results. In the academic realm, self-efficacy belief has received increasing attention in such areas as academic motivation and self-regulation (Pintrich & Schunk, 1995). Academically therefore, self-efficacy refers to one's perceived capability to perform given academic tasks at the desired level (Schunk, 1991).

For example, Bandura (1997) notes that it is possible to have high self-efficacy about a capability that one does not particularly value as well as the reverse. The more specific and skill-related the self-efficacy measure is, the more predictive it is likely to be for performance achievement. Studies have confirmed strong relationship between self-efficacy and academic achievement or learning outcomes (Pajares, 1996; Pajares & Kramlinger, 1994, 1995). Zimmerman's (2000) review of major findings on self-efficacy beliefs concludes that the variable positively relates to motivation. Researchers have found that students who are self-efficacious are more likely to undertake difficult and challenging tasks than students who are not self-efficacious. Moreover, they are more likely to exert more effort and to persist longer in the face of difficulties.

It has been found that perceived self-efficacy influences students' ways of learning as well as their motivational processes. Students who are self-efficacious appear to use more self-regulating strategies which lead to higher achievement (Hawthorne, 2004). Moreover, researchers have demonstrated that self-efficacy perceptions are also good predictors of reasonable generalized performances such as obtained grades (Bandura, 1993; Zimmerman, Bandura & Martinez-Pons, 1991). Likewise, Adeyemo (2001) reports that students' curricular option was influenced by self-efficacy. It is evident from the above that self-efficacy seems to have a significant impact on student's academic achievement.

2.3. How to measure self-efficacy

To measure self-efficacy in this study, the Morgan-Jinks students' self-efficacy scale developed by Morgan and Jinks (1999) was used. The instrument is a thirty-item scale and has an overall reliability coefficient of 0.8. The subscales Alpha are 0.78 for talents, 0.70 for context and 0.66 for efforts. This as well refers to the sample of the study. The instrument has a response format ranging from „Really agree (1) to Really disagree (4). Self-efficacy makes the least contribution but is found to be significant. The explanation by Bandura (1997) based on this result is something to go by as he says that those who have a sense of efficacy in

mastering academic task tend to learn better in formal school environment as well as in informal environment outside the school. Be that as it may, the sky is the limit for students that have good self-efficacy.

According to Bandura's social cognitive (learning) theory, an important source of motivation comes through the many links between goal setting and self-efficacy. Managers can begin by setting up small, basic goals leading up to larger, more difficult ones in order for the employee to develop beliefs of efficacy as each one that is successfully completed (Bandura, 1982). For example, if a new employee is assigned an extremely difficult task, the employee will likely experience self-doubt, stress, and threat of performing an unfamiliar task, resulting in an unsuccessful performance. However, if they are assigned a simple task and are able to experience initial success, with more difficult tasks being introduced slowly they are building high self-efficacy along the way (Bandura, 1982). These tasks are examples of performance outcomes, which are the most significant sources, used to develop self-efficacy. As stated by Bandura (1988), competencies are superbly developed when, "modeling is combined with guided practice and success experiences".

2.4. The work of Marcel LEBRUN (2011):

Impacts of ICT on the quality of student learning and the professional development of teachers towards a systemic approach. According to Marcel LEBRUN, the relationship between technologies and pedagogy has divided the scientific community for about thirty years. The potentials of educational technologies, from learning software to e-platforms learning through the interactive CD-ROM, have led to some believe that; a technological layer added to the usual forms of education would produce the amalgamation of the renewal of a school in search of resonance with a society itself in search of knowledge, and skills. A school and a society, both equally confronted with the rapid renewal and growth of knowledge, the need to learn throughout life, also socio-economic pressures, etc. The author says; most frequent research, often built on a comparison "with and without technology" and focused on the effects in terms of "success" of learners in a limited context (for example: a given institution, a particular tool , a specific discipline) have most of the time been marked with a no'. A phenomenon widely noted in the literature (Russell, 2009).

The author continues saying; these mixed effects could be extended to research "with this and other teaching method compared to a so called traditional teaching". The metaresearch of Kulik et al were also already going in this direction. The slight differences observed between

these devices being very often mark by significant variance or so drowned in a background noise related to the variety of disciplines. The different teaching methods surrounding the tools, as well as to the modalities of evaluations of the learning achieved (Kulik et al., 1980). About twenty years later, Morgan in his analysis of the effects of LMS (Learning Management System) speaks of accidental pedagogies for qualify education via the use of technologies. (Morgan, 2003).

The most likely causes of these inclusive results in terms of institutional strategy, for example, are according to the author: that is either the technological vehicle does not necessarily imply an overall of the resources or of the pedagogy used (the educational device). Also, the truck which brings food to the supermarket does not improve the nutrition of a community (Clark, 1983); it's either because the objectives, the methods and the evaluations are modified by "well thought out" uses of ICT. The comparison with more traditional approaches is made difficult or obsolete; - or even that the desired effects (in terms of skills or interpersonal skills) remain beyond the reach of certification evaluations still largely based on low-level skills or application (Bloom, 1956).

Generally, the author says that the training methods put in place "around the tools" remain strongly marked by improvisation whereas techno-pedagogues tell us, for a long time, the educational requirement is necessary for the development of these online hybrid or remote devices. Tardif, in 1996, already rightly proclaimed that rigorous pedagogy is an essential condition for ICT to keep its promises. In our opinion, this is probably where the problem lies. Technologies certainly carry potential for educational development but, in order to derive the expected educational values from them, they need to be framed by educational devices based on more incentive and interactive methods. Supported by new roles for actors, teachers and students, and aimed at developing the human, social and professional skills of these actors.

The circularity evoked in a figure by the author is based on internal coherences of technologies. That includes and go beyond the artefact and the tool to become an instrument for the construction of knowledge (Rabardel, 1995). That of pedagogies or rather of pedagogical support that aims to provide learners with opportunities in which they can learn (Brown and Atkins, 1988). If we already make a connection here with our subject, we can say that social networks can go beyond a platform of distraction to become a powerful learning environment that is a tool that will boost learning. The author illustrates the interactions proposed between the two poles of the figure in an article whose title is evocative: Quality

towards year expected harmony: pedagogy and technology speaking together about innovation (Lebrun, 2007).

This article presents, at different levels (learning, training, institution), this pedagogical, global and systemic coherence, "tools-methods-objectives" to which are added methods of assessing skills still under construction. It is close to the constructivist alignment (Biggs, 1996) that we complete in this article by the obvious persuasiveness of technologies in the information age that characterizes our third millennium. However, whether it is on the "Technologies" pole or on the "Pedagogies" pole, these intentions, these objectives, these standards, are modulated by the perceptions, the habits of the actors of which we spoke. However, it seems interesting to use and to complete this quick overview and give it strength by evoking the "Learning Outcomes". Recommended by the European Union in the field of higher education. The objectives (the skills that the student will have to develop and which he will have to demonstrate at the end of the program), methods (centered on the activity of the learner, such as, problem-based learning, project-based learning, collaborative learning, etc.), evaluations (formative and certifying allowing the learner to demonstrate what he can do).

These approaches, the tools, the instruments nevertheless evoked explicitly and laconically under the competence of " Literacy digital "or implicitly through uses evoked by transversal skills such as seeking and validating information, working in a team, knowing how to communicate? In terms of research, it is the methods of investigating the global circularity between technologies and pedagogies that we recommends approaches that combine at the same time the tools and then uses the methods put in place around the tool. The expected measures impacts on learning, the motives (resistance or incentives) of teachers and students using ICT, the impacts on their profession, on their professional development (Lebrun, 2007).

Ideally, this research will be based on the collection of information from the different actors involved (institutional managers, ICT managers, teachers, students), at different levels of involvement (motivations, tools, uses, cognitive instruments) and at different levels. Structural (institution, management of training programs, learning achieved). The e-Learning platforms, through the variety of tools and devices that can be developed there, which seem to us the constitute an interesting field for such investigations

In addition, as we are currently witnessing in most institutions, a mixture of face-to-face, hybrid, distance devices and this throughout the studies of the learners, we can hope to measure in these diverse contexts both differential and longitudinal effects brought about by ICTs. As far as we are concerned, by device we mean a coherent whole made up of resources

(material and human), strategies, methods and actors interacting in a given context to achieve a goal. The aim of the educational system is to teach someone something or better, to allow someone to learn something (Lebrun, 2005). Regarding hybridization, we consider it a fertile mixture and in variable proportions of different training methods, in presence and at a distance (Charlier et al. 2006), but also between transmissive teaching postures and related to learning support.

The hybrid devices that we are considering here are thus supported by a technological platform (a collection of tools) and their hybrid character stems from a modification of their constituents (resources, strategies, methods, actors and purposes) by a recombination of time and places of teaching and learning. It is therefore indeed a continuum, one dimension of which is linked to the presence-distance relationship and another to the "teaching" - "learning" relationship. The very current notion of flipped classroom, illustrates this hybridization well. We summarized it this way: "Homework at school" (Lebrun, 2011). In the context of Lebrun's research, the author wishes to empirically investigate the impact of these technologies on learning in different educational devices and to support the fact that the benefits of technologies for learning require appropriate, well-founded devices. On active, incentive and interactive pedagogies. This nomenclature was inspired to us (Lebrun, 2005) by the work of (Lesne,1977) which, in addition to pedagogical work methods (MTP) with a transmissive or normative orientation, distinguish TPM of the incentive type with personal orientation and of the appropriation type more built on social interactions (Lesne , 1977).

CHAPTER 2 VIRTUAL LEARNING AND SELF-EFFICACY

1. VIRTUAL LEARNING THEORIES

1.1. Community of Inquiry (CoI)

The “community of inquiry” model for online learning environments developed by Garrison, Anderson & Archer (2000) is based on the concept of three distinct “presences”: cognitive, social, and teaching (see Figure 4). While recognizing the overlap and relationship among the three components, Anderson, Rourke, Garrison, and Archer (2001) advise further research on each component. Their model supports the design of online and blended courses as active learning environments or communities“ dependent on instructors and students sharing ideas, information, and opinions.

Of particular note is that “presence” is a social phenomenon and manifests itself through interactions among students and instructors. The community of inquiry has become one of the more popular models for online and blended courses that are designed to be highly interactive among students and faculty using discussion boards, blogs, wikis, and video conferencing.

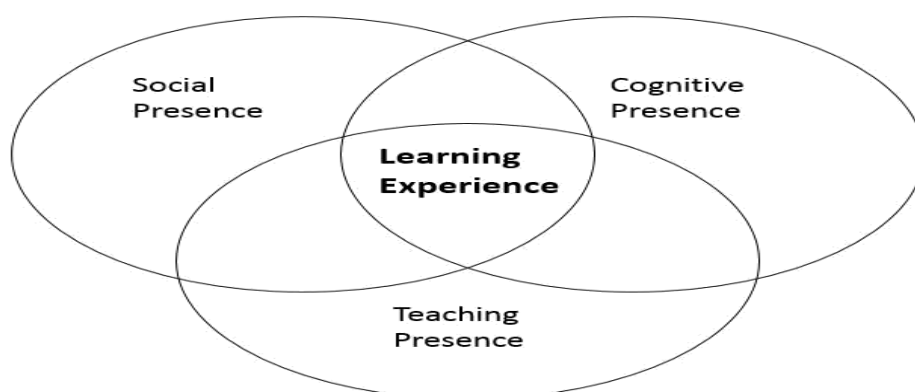


Figure 1: Community of Inquiry (Garrison, Anderson, Garrison and Archer, 2000)

1.2. Connectivism

George Siemens (2004), one of the early MOOC pioneers, has been the main proponent of connectivism, a learning model that acknowledges major shifts in the way knowledge and information flows, grows, and changes because of vast data communications networks. Internet technology has moved learning from internal, individualistic activities to group, community, and even crowd activities. In developing the theory, Siemens acknowledged the work of Alberto Barabasi and the power of networks. He also referenced an article written by Karen Stephensen (1998) entitled “What Knowledge Tears Apart, Networks Make Whole,” which accurately identified how large-scale networks become indispensable in helping people and organizations manage data and information.

Siemens describes connectivism as: the integration of principles explored by chaos, network, and complexity and self-organization theories [where] learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more and are more important than our current state of knowing” (Siemens, 2004).

Siemens noted that connectivism as a theory is driven by the dynamic of information flow. Students need to understand, and be provided with, experiences in navigating and recognizing oceans of constantly shifting and evolving information. Siemens proposed eight principles of connectivism. Connectivism is particularly appropriate for courses with very high enrollments and where the learning goal or objective is to develop and create knowledge rather than to disseminate it.

1. Learning and knowledge rests in diversity of opinions.
2. Learning is a process of connecting specialized nodes or information sources.
3. Learning may reside in non-human appliances.
4. Capacity to know more is more critical than what is currently known.
5. Nurturing and maintaining connections is needed to facilitate continual learning.

6. Ability to see connections between fields, ideas, and concepts is a core skill.
7. Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
8. Decision making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

1.3. Online Collaborative Learning (OCL)

Online collaborative learning (OCL) is a theory proposed by Linda Harasim that focuses on the facilities of the Internet to provide learning environments that foster collaboration and knowledge building. Harasim describes OCL as: a new theory of learning that focuses on collaborative learning, knowledge building, and Internet use as a means to reshape formal, non-formal, and informal education for the Knowledge Age” (Harasim, 2012, p. 81). Like Siemens, Harasim sees the benefits of moving teaching and learning to the Internet and largescale networked education. In some respects, Harasim utilizes Alberto Barabasi’s position on the power of networks. In OCL, there exist three phases of knowledge construction through discourse in a group:

1. Idea generating: the brainstorming phase, where divergent thoughts are gathered
2. Idea organizing: the phase where ideas are compared, analyzed, and categorized through discussion and argument
3. Intellectual convergence: the phase where intellectual synthesis and consensus occurs, including agreeing to disagree, usually through an assignment, essay, or other joint piece of work (Harasim, 2012, p. 82).

OCL also derives from social constructivism, since students are encouraged to collaboratively solve problems through discourse and where the teacher plays the role of facilitator as well as learning community member. This is a major aspect of OCL but also of other constructivist theories where the teacher is not necessarily separate and apart but rather, an active facilitator of, knowledge building. Because of the importance of the role of the teacher, OCL is not easy to scale up. Unlike connectivism, which is suited for large-scale

instruction, OCL is best situated in smaller instructional environments. This last issue becomes increasingly important when seeking commonality among online education theories.

1.4. An Integrated Model

Bosch (2016), in a review of instructional technology, identified and compared four blended learning models using twenty-one different design components. These models emphasized, to one degree or another, the integration of pedagogy and technology in course design. Among the models was a Blending with Pedagogical Purpose Model (see Figure 7), developed by this author, in which pedagogical objectives and activities drive the approaches, including the online technology that faculty members use in instruction. The model also suggests that blending the objectives, activities, and approaches within multiple modalities might be most effective for, and appeal to, a wide range of students. The model contains six basic pedagogical goals, and approaches for achieving them, to form learning modules. The model is flexible and assumes that other modules can be added as needed and where appropriate. The most important feature of this model is that pedagogy drives the approaches that will work best to support student learning. The modules are also shown as intersecting but this is optional; they may or may not intersect or overlap depending upon the approaches used. For instance, some reflection can be incorporated into collaboration or not, depending upon how the collaborative activity is designed. It might be beneficial to have the collaborative groups reflect specifically on their activities. Similar scenarios are possible for the other modules. Ultimately important is that all the modules used blend together into a coherent whole.



Figure 2. Blending with Pedagogical Purpose Model

2. ALBERT BANDURA'S THEORY OF SELF-EFFICACY

Self-efficacy can play a role in not only how you feel about yourself, but whether or not you successfully achieve your goals in life. The concept of self-efficacy is central to Albert

Bandura's social cognitive theory, which emphasizes the role of observational learning, social experience, and reciprocal determinism in developing a personality.

Self-efficacy is part of the self-system comprised of a person's attitudes, abilities, and cognitive skills, according to Bandura. This system plays a major role in how we perceive situations and how we behave in response to different situations. Self-efficacy is an essential part of this self-system.

2.1. Self- Efficacy Overview

According to Albert Bandura, self-efficacy is "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations." Self-efficacy is a person's belief in his or her ability to succeed in a particular situation. Bandura described these beliefs as determinants of how people think, behave, and feel. Since Bandura published his seminal 1977 paper, "Self-Efficacy: Toward a Unifying Theory of Behavioral Change," the subject has become one of the most studied topics in psychology.

Why has self-efficacy become such an important topic among psychologists and educators? As Bandura and other researchers have demonstrated, self-efficacy can have an impact on everything from psychological states to behavior to motivation. Our belief in our own ability to succeed plays a role in how we think, how we act, and how we feel about our place in the world. Self-efficacy also determines what goals we choose to pursue, how we go about accomplishing those goals, and how we reflect upon our own performance.

2.2 . The Role of Self-Efficacy

Virtually all people can identify goals they want to accomplish, things they would like to change, and things they would like to achieve. However, most people also realize that putting these plans into action is not quite so simple. Bandura and others have found that an individual's self-efficacy plays a major role in how goals, tasks, and challenges are approached.

People with a strong sense of self-efficacy:

- Develop deeper interest in the activities in which they participate
- Form a stronger sense of commitment to their interests and activities

- Recover quickly from setbacks and disappointments
- View challenging problems as tasks to be mastered

People with a weak sense of self-efficacy:

- Avoid challenging tasks
- Believe that difficult tasks and situations are beyond their capabilities
- Focus on personal failings and negative outcomes
- Quickly lose confidence in personal abilities

2.3. How Does Self-Efficacy Develop?

We begin to form our sense of self-efficacy in early childhood through dealing with a wide variety of experiences, tasks, and situations. However, the growth of self-efficacy does not end during youth but continues to evolve throughout life as people acquire new skills, experiences, and understanding. According to Bandura, there are four major sources of self-efficacy:

- i) **Mastery Experiences:** "The most effective way of developing a strong sense of efficacy is through mastery experiences," Bandura explained. Performing a task successfully strengthens our sense of self-efficacy. However, failing to adequately deal with a task or challenge can undermine and weaken self-efficacy.
- ii) **Social Modeling:** Witnessing other people successfully completing a task is another important source of self-efficacy.¹ According to Bandura, "Seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities to master comparable activities to succeed."
- iii) **Social Persuasion:** Bandura also asserted that people could be persuaded to believe that they have the skills and capabilities to succeed. Consider a time when someone said something positive and encouraging that helped you achieve a goal. Getting verbal encouragement from others helps people overcome self-doubt and instead focus on giving their best effort to the task at hand.

- iv) Psychological Responses:** Our own responses and emotional reactions to situations also play an important role in self-efficacy. Moods, emotional states, physical reactions, and stress levels can all impact how a person feels about their personal abilities in a particular situation. A person who becomes extremely nervous before speaking in public may develop a weak sense of self-efficacy in these situations.

However, Bandura also notes "it is not the sheer intensity of emotional and physical reactions that is important but rather how they are perceived and interpreted." By learning how to minimize stress and elevate mood when facing difficult or challenging tasks, people can improve their sense of self-efficacy.

2.4. Examples of High Self-Efficacy

So what exactly does high self-efficacy look like? You can probably think of some examples from your own life including areas where you feel a great deal of efficacy. People may possess a general sense of self-efficacy or in a specific domain where they believe they can do well such as school, work, friendships, parenting, sports, hobbies, and other areas.

Some examples of strong self-efficacy include:

- A man who is struggling to manage his chronic illness but feels confident that he can get back on track and improve his health by working hard and following his doctor's recommendations.
- A student who feels confident that she will be able to learn the information and do well on a test.
- A woman who has just accepted a job position in a role she has never performed before but feels that she has the ability to learn and perform her job well.

Self-efficacy can play an important role in health psychology and how people manage their health, nutrition, and illness. For example, having a strong sense of self-efficacy can help people who are trying to quit smoking stick to their goals.

Maintaining a weight loss plan, managing chronic pain, giving up alcohol, sticking to an exercise schedule, and following an eating plan can all be influenced by a person's levels of self-efficacy.¹ Bandura suggests that self-efficacy can benefit a person's sense of well-being in a number of ways. For instance, they remain optimistic and confident in their abilities, even when things become difficult. Because individuals with high self-efficacy look at difficulties as challenges rather than threats, they tend to be more intrinsically interested in the tasks they pursue. Difficulty and failure don't mean defeat; instead, these individuals redouble their efforts and look for new ways to overcome.

2.5. Issues with Low Self-Efficacy

People who are low in self-efficacy tend to see difficult tasks as threats they should avoid. Because of this, they also tend to avoid setting goals and have low levels of commitment to the ones they do make.

When setbacks happen, they tend to give up quickly. Because they don't have much confidence in their ability to achieve, they are more likely to experience feelings of failure and depression. Stressful situations can also be very hard to deal with and those with low self-efficacy are less resilient and less likely to bounce back.

2.6. Building Self-Efficacy

“People's beliefs about their abilities have a profound effect on those abilities. Ability is not a fixed property; there is a huge variability in how you perform. People who have a sense of self-efficacy bounce back from failure; they approach things in terms of how to handle them rather than worrying about what can go wrong” (Bandura, 1977b).

- **Emphasize Peer Modeling:** Learning from examples set by those around you happen at any age (think of how a teacher is a role model for a student but in a similar manner an employer is a model for an employee). This concept of peer modeling, while it can be applied to any age, is of course especially true for children on the early side of the spectrum, and is most effective when a child's direct peers (brothers, sisters, parents, teachers, friends) set the example (Bandura, 1988). To put peer modelling into simple terms – it is when a child or an adult shows good social behaviors, and is interested in passing on those same values to a new person. Take for example a work setting – one employee takes center stage for the week and shows both business savvy and good

social behaviors. This employee will be a peer model to the rest of the employees of the company – they will want to learn how to act and behave in that manner, especially if this good behavior helped them achieve more success or drew more praise from the boss.

- **Seek Feedback:** The problem with understanding feedback is that some people tend to believe that getting no feedback is the same as being told that one is doing their job well (hence the common phrase: “no feedback is great feedback”). When done with both the right intentions in mind and also in the right manner, feedback can be one of the most important sources of building levels of self-efficacy. Employees and students alike tend to want to know how they are doing. In order for the feedback to work positively, feedback must be delivered both concisely and frequently. Without frequent feedback, one can be confused as to whether they should remain doing what they are doing and without concise feedback, the individual will not understand what in particular they should fix about themselves. Self-efficacy and subsequent task performance improves after receiving higher, more detailed levels of performance feedback (Beattie, Woodman, Fakehy, Dempsey, 2015).
- **Encourage Participation:** Participation tends to be essential in any work environment – it encourages the person to be active and engaged, great qualities in someone that are usually influential in a person’s levels of self-efficacy. Participation is especially important at an early age – those students who engage with the class are not only being more active in their learning, they are probably absorbing more information in regards to the material. Active class participation is also correlated to having high critical and higher level thinking skills. Participation is also an essential quality of a peer model – this is a person who has previously engaged in active learning and can teach others in a similar manner. The level of thinking associated in an activity that requires participation goes beyond simple comprehension of text – it engages both the instigator and the audience. More importantly participation helps fellow students learn from each other – and people tend to build their levels of self-efficacy depending on how those who are most close to them behave.

- **Allow People to Make Their Own Choices:** When talking about the importance of letting people make their own choices the term self-accountability usually tends to come to mind. Whether the outcome is positive or negative – making one's own decisions allows for one to feel responsible (due to your cunning or due to your negligence, the person themselves is the one held accountable for if the outcome turned out in your favor or against you). Another important reason to emphasize self-accountability - making one's own choices and decisions allows them to make their own mistakes and – most importantly – gives them the opportunity to learn from them. Advice is not the same as a command – an individual can advise one on something, but it is a person's own responsibility to do whatever they feel like with said information. This is why a peer - although very helpful – is not enough; the person needs to understand that at the end of the day – if they want to model anyone – the only person capable of taking action themselves.

3.3. The theory of the community of practice: Wenger (1990).

Wenger (1990) approaches learning as a social fact that cannot be done outside the social context. Man being a social person, can only consider its activities in interaction with the company including its learning activities. It is from this conception of man that Wenger (1990) will therefore estimate that the learning process is intrinsically social and he cannot be dissociated from context social. In other words, the learning process cannot be understood as detached processes, which is removed from reality. Situated learning is a theory, which states that in the learning process, taking into account the context, the environment is very important. After Wenger, (Tardif, 1998), goes by his works look up the point of view stating that the learning process fits into educational environments that take into account the concerns of learners.

At this time, the knowledge and skills developed are considerable and it is not a question of learning that is in the abstract, but of learning in action. A good learning environment is an environment that allows the learner to enter a community of experts who guide and advise him (Jermain, 1996). This theory is based on the acquisition of skills or the learning process that takes place in the environment in which they would be used. As a result, the skills developed take into account the know-how and knowledge. In addition, information and communication technologies offer exceptional possibilities for bringing learning into the classroom. It therefore appears from the approach that cognition does not reside in an

individual's head, in the form of abstract knowledge that is transported from one situation to another.

Cognition is found in the interaction between a person and the other people around him, the objects and tools that are found in his environment as well as the social practices developed within his culture. (Basque, 2004). Wenger (1990) therefore developed the concept of design. One of the activities traditionally associated with design in education is the codification of knowledge in a refined domain, like a textbook or a school program. This type of reification in education creates an intermediate stage between the practices and the learners. Therefore, this one could be an obstacle and a learning aid. It is from this perspective that mediated education appears as an indispensable resource for teaching.

Moreover, it is this media education that pruned the orientation law of education in Cameroon. The ICT as underlined Wenger (1990) therefore creates this bridge between the student, and the learning object. The language computing is the process of transforming a concept into a computing object. That said, the ICT through his resources offers the concepts studied, in particular climate, giving it an image that approaches reality and through which the student can easily build their skills. The knowledge for educational purposes offers novices a concrete and stable element to help them become full members, but it does not guarantee access to effective forms of participation. It is, moreover, one of the advantages of using ICT in teaching / learning.

ICTs offer knowledge, which in traditional teaching practices is difficult to find substance, that is to say, which is difficult to perceive. In other words, ICT therefore offers a framework, a context, an environment, a body in which the concepts perceived as abstract find a concrete form, a form perceptible from the image attributed to it. That said, mediated education that is teaching / learning a design suitable not only for the contextual lessons. In fact, learning involves mechanisms, processes of perception and memorization, the acquisition of automatism and skill, the processing of information, the creation of activities and changes in behavior.

The importance of learning processes should not make them the focus at educational design. Emphasizing the mechanisms of learning at the expense of meanings tends to make learning problematic by rectifying it as a process and participants as learners. Learning a concept will seem much more difficult if the goal is to memorize it in a list of several concepts rather than including it in constructive activities. In many cases, when the meaning of learning is well understood by the student, the mechanisms for building skills is triggered by

themselves. Students faced with the concept of climate change will be able to better build skills. Grace in immersion, in part because ICT provides him with experiences he can concentrate on. Focusing on teaching is not the same as focusing on learning. These two elements are not symmetrical.

In a teaching context, such as a training course or session, the reification of learning combined with institutional power makes teaching seem like learning. However, concrete learning does not constitute a response to educational objectives. Teaching does not lead to learning; it creates a context in which it takes place, in a sense different than other contexts. In other words, what is learned is not necessarily, what is taught or, in a general sense, the learning expectation of the educational institution. Learning is an ongoing and emerging process that can use teaching as one of many resources. In this regard, teachers and teaching materials become learning resources in a much more complex way than the teaching objectives (Wenger, 1990).

In other words, building skills by students does not necessarily have to go through a teaching process. That said, media coverage offers the learner an autonomy, which allows him in an autonomous and individual way to build himself skills without the help of a teacher. In other words, this media coverage also offers an environment of co-construction and action. The debate surrounding pedagogical questions usually on choices like authority or freedom, teaching or discovery, cooperative learning or education traditional. There is no doubt about the learning environment cooperative and teaching more modern and interactive that offer ICT. Although the real question concerns the interaction between the conceived and the emergent. Education must take advantage of the circumstances, for it cannot control its own effects.

What is at issue is not its power per se, but how far it can hinder the negotiation of meaning. Once again, what matters is the interplay between the conceived and the emergent. Simply put, it is the ability of teaching and learning to interact to become resources of mutual construction. The teaching methods establish this framework of interaction between the teacher and the learner; it establishes also interactions between learners. So far, where the design in education generates its practices, it will tend to contain their own regimes of competence as well as their own encounters between generations (Wenger, 1990). Whether a group of students is the product of a specific educational design does not guarantee for all that greater efficiency of what is learned there by comparison with what can be learned elsewhere.

In fact, as it has been shown, if the practices of a school become independent,

they become self-sufficient. School learning is therefore only about learning what a school is. It therefore emerges that, the theory of situated learning is based on the interactions that the learner has with his learning environment. As a result, it is more than important that the learning content be contextualized, as well as the tools used in this process learning. There is therefore an interdependence between the learner, his cultural background, his learning environment and his knowledge (Basque, 2004). Through this theory which advocates a rapprochement between not only the learning content, but also the learning environment, the TIC offer this interface and these tools necessary for contextualization of the study environment through images, photos and necessary for the contextualization learning content.

These mediated teaching methods offer nt a new design learning concepts in geography. As part of the new geography programs that introduces changes in content and new skills to be built by learners. The educational use of ICT offers learners a media culture, offering them, among other things, an environment and a virtual learning interface that facilitates the rectification of certain concepts such as climate considered as an abstract of our , difficult to understand. As for the teacher, ICT offers him a large number of exploitable resources to facilitate the construction of skills by the learner.

3. EMPIRICAL STUDIES ON THE RELATIONSHIP BETWEEN VLE AND SELF-EFFICACY

Research on self-efficacy and computers is mainly related to learners' confidence in their capability of using computers and other type of technologies. For example, Jan (2015) conducted a study with 103 graduate students taking online courses at a university in USA. The researcher measured academic self-efficacy, computer self-efficacy, prior experience with online learning and student satisfaction. The results of the study found a positive and significant relationship between computer self-efficacy and prior experience with online learning, and between academic self-efficacy and prior experience with online learning, and between academic self-efficacy and student satisfaction.

Findings also show a positive and significant relationship between academic self-efficacy and computer self-efficacy, and between prior experience and student satisfaction. However, computer self-efficacy and student satisfaction have no positive or significant relationship. Similarly, simmering et al. (2009) found that computer self-efficacy is not related to motivation to learn in online courses, however, computer self-efficacy was positively related to prior experience with online learning and online learning technology anxiety.

Correlation between VLE use and self-efficacy for different classes of students or different type of modules can yield insights into the effective use of VLEs. E learning environments are frequently used in higher education as a support to education processes in different domains and levels of knowledge. They offer a set of pedagogical and technological resources that favour equitable learning processes and are able to answer students' learning needs (Rienties et al, 2012). These educational scenarios allow students to log on from any place at any time and access information in multiple formats with no physical or temporal barriers, however students' learning results are less than expected. Some authors posit that students' learning achievement, when interacting with web environments can be associated with two of their psychological characteristics: academic self-efficacy and cognitive style. The results of several studies show that students with low level of self-efficacy have difficulties performing effectively when interacting with web scenarios, which leads to low academic achievements and to a lack of motivation towards learning.

Similarly, self-efficacy produces differential effects in students with respect to the way they participate in and respond to learning situations in web environments (Demirhan,2006). In this sense, students' self-efficacy perception and stylistic characteristics are associated with learning achievement when subjects interact in web environment. Online learning offers learning experiences with technology which provides accessibility, connectivity, flexibility and ability to promote interactions among learners. As the number of online learning users continue to increase there is a need to understand how students can best apply learning strategies to achieve success within the online environment.

Virtual reality is a means for humans to visualize, manipulate and interact with computers through the use of complex data. There is some recent virtual reality application with interface e-learning, the main goal of virtual learning laboratory is to provide simulations, tools applications which will constitute an efficient space where experimentation and collaboration which is use for maintenance and exchange of rich knowledge. Virtual environments success is based on the combination of audio-visual media content that is prevalent in these applications and enhances the absorption of information in students' memory, thus it helps to improve learning processes.

Hartnett et al. (2011) used a qualitative case study to research motivation in distance learning environments. The data for the research was collected using questionnaires and interviews. The study indicated that online environments provided learners with various avenues to increase their motivation. Learners can accomplish this through their engagements with their learning activities and with their learning environment.

The research that McGill and Hobbs completed on how students and instructors who used a VLE perceive the fit between technology and task showed that teachers scored lower on task technology fit than the students. McGill and Hobbs argued that this was a result of instructor tasks and purposes for using the technology-supported environment being different and more complex than student tasks. Technology acceptance models are also concerned with an individual's perceptions and attitudes towards using technology (Mogus et al., 2012). Mohr and al. research supports Mogus et al.'s argument on learners' perceptions and attitudes towards technology. The technology acceptance model theory should be considered when trying to understand how individuals made their decisions on using educational technology (Mogus et al., 2012). This view is supported by research that shows that individuals have various reasons for choosing to use the technology that they use (Yoon & Lim, 2010). Yoon and Lim noted the following reasons as the main influencers: (a) their perception, (b) the perception of their peers, and (c) how well they perceived the technology as fulfilling their needs. These points are important to understand because they could affect the organization's decisions as to what modality to use to deliver training.

Penjor (2016) argued five adoption personalities in learners must also be taken into consideration when rolling out new technologies or upgraded technologies. Innovators, early adopters, early majority, late majority and laggards are the five adoption personalities that Penjor were referring too. The five adoption types come from Roger's theory of diffusion of Innovation (Rogers, 2003). Roger's theory is a very popular framework used for technology adoption (Penjor, 2016). Penjor (2016) research on VLEs revealed that learners' motivation to use a VLE was influenced by whether they were an innovator, early adopter, early majority, late majority or laggard. An internal communication plan and a pilot program for the training are two strategies that could be used to promote positive perceptions and attitudes toward accepting new technology as a learning tool (Penjor, 2016).

Hall and Hord (2011) noted that the communications plan is very important and is integral to implementing any new technology in the organization. The communication plan

should include a change management strategy for learners and instructors that address their beliefs, opinions and current practices. The communication plan should address how the technology will benefit the training and how that will translate into advantages for the learners (Reidsema, Cameron, & King, 2013). A pilot study can provide instructors and course developers with an understanding of how the training was perceived, utilized and how effective it was. The results of the pilot program could assist educators and course developers in designing and developing training that could help create a good learner technology fit and provide positive learner perceptions (Hall and Hord, 2011). Yu and Yu (2010) used pilot programs along with surveys and questionnaires in their study on modelling factors that affect an individual's utilization.

The pilot programs allowed Yu and Yu to explore how learners interacted with the technology. The surveys and questionnaires were used to explore learners' attitudes and perceptions and the perceived usefulness for the technology. Yu and Yu's (2010) study revealed the importance of good instructional design. The role of self-efficacy in online learning environments is still in need of more investigations. Computer self-efficacy had significant impact on student satisfaction with online environments and intention to take future online courses in some studies, while others showed no relationship. Internet self-efficacy predicted student performance and satisfaction with online learning but in other studies, it showed that it does not. LMS self-efficacy had no impact on performance in fully online learning environments but had impact in hybrid courses. Consequently, that there are two possible hypotheses.

A possible hypothesis is that self-efficacy plays an important role in online learning; another possible hypothesis is self-efficacy does not play an important role in online learning. Because of little research has been done to investigate the relationship between self-efficacy (other than technology factor) and online learning and because of opposing possible hypotheses. More research is needed to develop of understanding the nature of the relationship. Although computer skills, Internet skills and information-seeking skills are needed for online learning but they oversee other dimensions of online learning such as learning, interaction and collaborative skills. Those aspects together are important to consider when measuring self-efficacy in online learning.

Self-efficacy is the belief in one's capabilities to organize and execute the requisite action required to produce particular results. Beliefs about self-efficacy determine level of motivation as reflected in the amount of effort exerted in an endeavour and the length of time devoted to a challenging situation. Research findings have demonstrated that self-efficacy is a better predictor of academic achievement than other cognitive or affective processes. Also the dropout rate among students in online learning environment is higher than that in traditional learning environment, thus dropout rate is also related to self-efficacy.

VLE are web based systems that enable students to interact with teachers and classmates, access learning resources anytime and anywhere, and use Communication Technologies (ICTs). Along with the developments in ICTs the role of VLEs in educational activities has become increasingly important. Today, to support students and lectures in the process of teaching and learning almost all universities in the developed countries own some form of VLE such as Moodle or blackboard and it should be noted that VLEs are increasingly popular in higher education, and the use suffers from the lack of widespread change in pedagogic practices. Khlaisang and Songkram (2019) states that VLE systems can help improve the demand for higher education in the twenty first century especially in knowledge acquisition and cognitive skills development which is one of the challenge of educating the digital generation.

Hypothesis of research It is a provisional answer to a question asked, it is again the presumed answer to the question which directs a research. Fonkeng , Chaffi and Bonda (2013) define the hypothesis as: " A supposition from which consequences are possible. It is a statement that admits a link between the variables (dependent and independent), which link will only be validated or informed after a rigorous and reproducible analysis, investigation and test has been completed. " Study hypothesis Le pr this work is based on four research questions as formulated in the previous chapters which leads therefore to also formulate four hypotheses in particular, a general hypothesis and two specific hypotheses. The general hypothesis that guided this study is formulated as follows.

General hypothesis .

Grawitz (2004) defines the hypothesis as "a proposed answer to the question asked about the object under study. It is about choosing a particular answer to the question asked ". It allows the selection of the facts to be observed with a view to their interpretation for a better

verification. In the case of the present research, the general hypothesis is the answer to the main question posed above.

Rikam (2009) for its part defines the general hypothesis like that which is generic and which does not give the researcher the possibility of quantifying or measuring the various related variables. In addition, it is the provisional answer to the main question.

Virtual environment affects self-efficacy belief amongst students of the university of Yaoundé 1

Variables of the general hypothesis By variable we mean a concept, a notion, something that can be changed, such as a characteristic or a value. In studies in psychology, variables are used to establish a causal relationship between different values in the study, in other words, they are used to determine whether changes in one thing lead to changes in another. thing. There are usually two types of variables in particular, a so-called dependent variable, another called independent.

The dependent variable is the variable which is measured by the experimenter, furthermore, the dependent variable is the "effect" variable ie the variable which undergoes. The independent variable for it is the variable which is controlled and manipulated by the experimenter; In other words, the independent variable is the cause variable, it is this which induces the effects on the dependent variable. To verify the hypotheses of our study, it is important to operationalize the variables by breaking down these variables into categories and into indicators of these variables. The synoptic table proposed below summarizes the methods and indicators of the various variables. As part of this research, the topic is formulated around two variables: including a VI and an VD According to Grawitz (2004 p.326), "the variable is not only a factor which varies during the survey, it is a factor which changes in relation to others and it is these fluctuations which constitute the object of the study. research ". The variable is therefore defined as a phenomenon which can take different values with given frequencies. In order to better understand the influence of our VI on DV, we have broken down IV into two modalities namely:

Independent variable (VI): ***virtual learning environment***

Dependent variable (VD): ***belief in self-efficacy from students of university from Yaoundé 1***

Research hypotheses specific.

This study is based on two secondary hypotheses:

HR1: *Does online learning platforms affects self-efficacy belief amongst students in the University of Yaounde 1*

HR 2: *Is there a relationship between open source education search engines and self-efficacy belief amongst students in the University of Yaounde 1*

HR 3: *Does social networks correlates with the self-efficacy belief amongst students in the University of Yaounde 1*



**PART TWO:
METHODOLOGY AND RESULTS OF THE STUDY**

CHAPTER 3: METHODOLOGY OF THE STUDY

1. Introduction

This chapter consists of the research method and procedures of the study. It makes a justification for the research design, study area, sample, instrumentation and ethical considerations of the study.

2. Research design

A descriptive survey research method was used for the study whereby the data was collected using a questionnaire from sample of the entire population. Survey research designs are procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviours, or characteristics of the population. This design has the advantage of measuring current attitudes or practices. The main idea behind using this type of research was to better define an opinion, attitude, or behaviour held by students of the University of Yaoundé about virtual learning environment. Since there was a predefined category a respondent must choose from, it was considered descriptive research. Thus grouping the responses into predetermined choices provided statistically inferable data. This allowed the researcher to measure the significance of results on the overall population in the study.

3. Study area

The **University of Yaoundé** is a public university in Cameroon, located in the capital Yaoundé. The main university complex is Ngoa-Ekelle with several satellite campuses elsewhere. Founded in 1962, University of Yaounde I is a non-profit public higher-education institution located in the metropolis of Yaoundé (population range of 1,000,000-5,000,000 inhabitants), Centre Region. Officially recognized by the Ministère de l'Enseignement Supérieur, Cameroun (Ministry of Higher Education of Cameroon), Université de Yaoundé I (UYI) is a large (uniRank enrollment range: 10,000-14,999 students) coeducational Cameroonian higher education institution.

Université de Yaoundé I (UYI) offers courses and programs leading to officially recognized higher education degrees such as bachelor degrees in several areas of study. See the uniRank degree levels and areas of study matrix below for further details. This 58 years old Cameroonian higher-education institution has a selective admission policy based on entrance examinations. UYI also provides several academic and non-academic facilities and services to students including a library, sports facilities, study abroad and exchange programs, as well as administrative services. Following a university reform that split the country's oldest university, the University of Yaoundé, into two separate entities: The University of Yaoundé I and the University of Yaoundé II.

The University of Yaoundé I, consists of:

- the Faculty of Arts, Humanities and Social Sciences
- the Faculty of Sciences
- the Faculty of the Sciences of Education
- the Faculty of Medicine and Biomedical Sciences
- The Higher Teacher's Training College of Yaoundé HTTC
- The National Advanced School of Engineering
- The Higher Teacher's Training Technical School of Ebolowa.

4. Population

The target population of this study included the students of the University of Yaoundé

1. The accessible population consisted of students of the Faculty of Sciences of Education.

Source: United councils and cities of Cameroon

5. Sample of the study

The sample of the study included 200 students of the Faculty of Sciences of Education, University of Yaoundé 1

Table 1: Sample population of the study

Year of study	Total population	Sample of students
Year 1		65
Year 2		65
Year 3		70
Total		200

6. Sampling technique

A purposive or judgemental sampling technique was adopted for this study. In this regard, specific elements which satisfy particular criteria of the study were selected. Hence, extra care was taken select students for the research. The following criteria were used to adopt purposive sampling:

- Students had to be officially enrolled in the university online learning platform
- Students who indicated their lecturers were using social networks for learning purposes
- Students who have access to open virtual learning resources and search engines. Children must be of adolescent age group.

7. Description of instrument

To determine the extent to which virtual learning environments affects self-efficacy beliefs. The questionnaire was made of 4 sections. Section one: online learning platforms and self-efficacy beliefs, made of 6 items; Section two: search engines and self-efficacy beliefs, made of 6 items; Section three: social networks and self-efficacy beliefs, made of 6 items.

8. Validity of instruments

The validation of data collection instrument in this study was based on face and content validity.

8.1 Face validity

The face validity of the instruments was conducted by the researcher, the supervisor and co-supervisor. The researcher constructed the instruments based on the conceptual review of the major indicators of the study. The instruments were then given to the supervisor and co-supervisor for cross-examination. Certain items were readjusted based on recommendations of the two supervisors.

8.2 Content validity

Content validity focused upon the extent to which the content of the instruments corresponded to the content of the theoretical concept they were designed to measure. Content validity was therefore mathematically appreciated using the Content Validity Index (CVI) whereby the instruments for data collection were checked by three experts in the field of developmental psychology. To come out with the statements that an instrument is judged valid, the inter-judge coefficient of validity was computed using the following formula: $CVI = (\text{No of judges declared item valid}) / (\text{total No of judges})$ The 0.75, CVI obtained for this study was declared satisfactory.

9. Reliability of instruments

A pilot study of the research instruments was carried out on 25 students to make sure that they understood the questions and that the questions measured what they ought to measure very well and exhaustively. This led to the revision of some items in the questionnaire. To ensure that the research instruments measured consistently what they were designed to measure, the instruments were trial-tested using 25 students. The Alpha reliability coefficients of above 0.87, obtained for this study was declared satisfactory.

10. Procedure of administration of instruments

The technique or mode for administration of instruments was face-to-face administration. This is because the researcher wanted to obtain a high return in the number of questionnaires that were given out.

10.1 Steps carried out in administration of instruments

- 1) The informed consent of faculty authorities was sought before the actual administration of instruments
- 2) Students who made the criteria for the study were then selected.
- 3) The questionnaire was administered to the students.

11. Procedure of data analysis

A pre-designed EpiData Version 3.1 (EpiData Association, Odense Denmark, 2008) database which had in-built consistency and validation checks was used to enter the data. Further consistency, data range and validation checks were also performed in SPSS version 21.0 (IBM Inc., 2012) to identify invalid codes. Data were made essentially of categorical variables, some of them dichotomous, and they were analysed using frequency and proportions and Multiple Responses Analysis to aggregate score for a given conceptual components. The mean and standard deviation were used for descriptive statistics. Inferential statistics was done using the Pearson Correlation and Analysis of Variance (ANOVA) validation test (Ominbus Tests of Model Coefficient $P < 0.05$). Whereby, if the p value is less than 0.05 then the relationship is significant.

12. Ethical considerations

Ethical and administrative approval to conduct this study was obtained from the Faculty of the Sciences of Education of the University of Yaoundé 1. In this line, the researcher made sure the participants were adequately aware of the type of information needed from them, why the information was being sought, what purpose it was put to, how they were expected to participate in the study, and how it directly or indirectly affected them without pressurizing them to consent. They students were assured that the information they provide was to remain

confidential and be used only for academic and research purposes. The informed consent was based on confidentiality, neutrality and impartiality. The freewill of participants were by letting them to know that those not interested are free to withdraw at any time from the study without any sanction, and finally that the anonymity and confidentiality of their responses will be ensured.

On the part of the researcher, ethical considerations consisted in avoiding bias, using appropriate research methods; using appropriate methods to validate the data collection instruments, doing correct reporting of findings without falsifying them.

**CHAPTER 4:
DESCRIPION OF RESULTS AND DISCUSSIONS**

		Frequency	Percent
Valid	20-25	80	40
	26-30	90	45
	30+	30	15
	Total	200	100.0

1. Presentation of Results

1.1 Demographic information

Table 2: Age of respondents

Table 2: above indicates that there were 200 participants in the research. It provides their age differences. Accordingly, 80 participants were between the ages of 20-25years giving 40 percent. Between the ages of 26-30, there were 90 participants making a total of 45%. While between the ages of 30yrs and above, there were 30 participants, giving a total of 15%. There were more participants between the age of 26-30 years and least were those between the ages of 30 and above.

Table 3: Gender of respondents

		Frequency	Percent
Valid	Male	95	47.5
	Female	105	52.5
	Total	200	100.0

Table 4 above indicates the gender of the respondents.

47.5% of the respondents were males, that is, 95 out of the 200 respondents were males; while 52.5% were females, that is, 105 out of the 105 participants. Thus there were more female respondents than males.

1.2 Classification of virtual learning environments

1.2.1 Types of virtual learning environments used in the University of Yaoundé 1

Table 4: Types of VLE mostly used by students

VLE	Most used types
Online learning platform	Moodle
Open source Education Search Engines	Google
Social media networks	WhatsApp

1.2.2 Classification of respondents per virtual learning environment

Table 5: Percentage of respondents using different platforms

VLE	Percentage of respondents using different VLE
Online learning platform (Moodle)	60%
Open source Education Search engines (Google)	100%
Social media networks (WhatsApp)	80%

From the analysis above, it can be seen that just 60% of the students effectively use the University online learning platform (Moodle) for academic purposes. While all respondents (100%) indicated that they use open source education search engines and 80% used social media networks for academic purposes.

1.2.3 Classification of respondents per preference in the use of VLE

Table 6: Percentage of respondents in preference of different VLE

VLE	Percentage of respondents in preference of different VLE
Online learning platform (Moodle)	30%
Open source Education Search engines	100%
Social media networks	70%

From the analysis above, it can be seen that only 30% of the student population preferred to use the university online learning platform (moodle) for academic purposes. While 100% preferred to use open source education search engines and 60% preferred to use social media networks.

1.2.4 Reasons for preference in use of VLE

VLE	Percentage of Preference	Reasons for preference
Online learning platform (Moodle)	30%	Most students did not prefer moodle because it gives room for little direct communication with lecturers and they cannot easily access with their android phones and procedures for registration into the platform and access to materials is complicated.
Open source Education Search engines (Google)	100%	All students preferred to use Google because it has enough material and write-ups that permits them to complete their assignments and get reading material for examinations
Social media networks (WhatsApp)	70%	WhatsApp was preferred by most students because it permits for easy interaction and can easily be accessed with the use of android phones. Students can easily exchange materials.

1.3 Presentation of results according research questions

1.3.1 Research question (RQ) 1: How do online learning platforms affect self-efficacy belief amongst students of the University of Yaoundé 1?

Table 7: Online learning platforms and self-efficacy.

		Online learning platforms	Self-efficacy
Online learning platforms	Pearson Correlation	1	.282 ^{**}
	Sig. (2-tailed)		.003
	N	200	200
Self-efficacy	Pearson Correlation	.282 ^{**}	1
	Sig. (2-tailed)	.003	
	N	200	200
** . Correlation is significant at the 0.05 level (2-tailed).			

From Table 7 above, the Pearson Product Moment Correlation Coefficient ($R = 0.282$, $P=0.004$) indicates that there is a positive relationship between online learning platforms and self-efficacy of students. This relationship is significant with a P value of 0.003

Table 8: Ability to use university online learning platform and self-efficacy between age groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	189.373	2	94.687	6.194	.003
Within Groups	1482.817	97	15.287		
Total	1672.190	99			

There is a significant difference in the respondents based on age on the ability to use the university online learning platform and self-efficacy of the students. This is demonstrated by the One-way ANOVA ($F(2, 97) = 6.2$, $p= 0.003$). The post hoc Tukey B analysis shows that those in the age of 30years and above have a better mastery of the use of the university online learning platform, and view themselves to be more efficacious in its use.

1.3.2 Research question (RQ) 2: To what extent do open source education search engines affect self-efficacy belief amongst students of the University of Yaoundé 1?

Table 9 : Open source education search engines and self-efficacy.

		Open source education search engines	Self-efficacy
Open source education search engines	Pearson Correlation	1	.384**
	Sig. (2-tailed)		.002
	N	200	200
Self-efficacy	Pearson Correlation	.384**	1
	Sig. (2-tailed)	.002	
	N	200	200
**. Correlation is significant at the 0.05 level (2-tailed).			

From Table 5 above, the Pearson Product Moment Correlation Coefficient ($R = 0.384$, $P=0.002$) indicates that there is a positive relationship between open source education search engines and self-efficacy of students. This relationship is significant with a P value of 0.002

Table 10: Open Source Education and self-Efficacy between age groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	33.160	2	16.580	2.329	.103
Within Groups	690.550	97	7.119		
Total	723.710	99			

There is no significant difference in the respondents based on age on the ability to use the Open source education search engine for learning and self-efficacy of the students as demonstrated by the One-way ANOVA ($F(2, 97) = 6.2$, $p = 0.103$).

1.2.3 Research question (RQ) 3: How do social networks affect self-efficacy belief amongst students of the University of Yaoundé 1?

Table 11: Social networks and self-efficacy.

		Social networks	Self-efficacy
Social networks	Pearson Correlation	1	.385**
	Sig. (2-tailed)		.002
	N	200	200
Self-efficacy	Pearson Correlation	.385**	1
	Sig. (2-tailed)	.002	
	N	200	200
**. Correlation is significant at the 0.05 level (2-tailed).			

From Table 11 above, the Pearson Product Moment Correlation Coefficient ($R = 0.385$, $P=0.002$) indicates that there is a positive relationship between social networks and self-efficacy of students. This relationship is significant with a P value of 0.002

Table 12: Social Network and self-efficacy between age groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	60.475	2	30.237	3.430	.036
Within Groups	855.165	97	8.816		
Total	915.640	99			

There was a significant difference in the respondents based on age on the ability to use Social Networks and self-efficacy as demonstrated by the One-way ANOVA ($F(2, 97) = 3.4$, $p = 0.036$).

2. Discussion of Results

Generally, there was a positive relationship between the use of virtual learning environment and the self-efficacy of students of the University of Yaoundé I. It should be

noted that this relationship was significant for all three indicators of virtual learning environments, that is, online learning platform, open source education search engines and social networks. Nonetheless, it is worth noting that when comparison was made between the age groups. It was discovered that there was a significant difference between those from 30 years and above and those below in the use of the university online learning platform. Those from 30 years above showed more mastery in the use of the university online learning platform than those below the age of 30. But there was no significant difference in the use of open source education search engines and social networks between the various age groups.

3. Online learning platform and self-efficacy

The findings of the study showed that there was a positive and significant relationship between online platform and self-efficacy of students. This positive relation was equally significant between the age groups with those above 30 years showing more efficacy in the use of the university online learning platform than those below 30 years of age. This could be explained from the fact that those above 30 years were mostly old students of the university who must have mastered the university online learning platform than those below the age of 30 that were mostly new students still trying to learn how to use the platform. Hence prior experience to online learning can significantly affect the self-efficacy of students.

This finding fall in line with a study that was conducted by Jan (2015) with 103 graduate students taking online courses at a university in USA. The findings also show a positive and significant relationship between academic self-efficacy and computer self-efficacy, and between prior experience and student satisfaction. Similarly, Simmering et al. (2009) found that computer self-efficacy is not related to motivation to learn in online courses, however, computer self-efficacy was positively related to prior experience with online learning and online learning technology anxiety.

3.1 Open source education search engines and self-efficacy

The findings of the study showed that there is a positive and significant relationship between open source education search engines and self-efficacy of students. Nonetheless there was no significant difference between the age groups. This could be explained from the fact that open source education search engines like Google are open to all learners and do not need prior experience and formal tutoring like the university online learning platform. Hence, students are likely to be equal in the use of open source education search engines. Research

findings have found a significant relationship between self-efficacy and the behaviour of information searching in the sense that the more a person has self-belief, the higher the level of their ability for information searching will be (Ata & Baran, 2011; Adalier & Serin, 2012; Çakmak, 2010).

However, the concept of information searching self-efficacy as an integrated concept is people's belief about accessing, using, sharing and evaluating of information (Kurbanoglu, Akkoyunlu & Umay, 2006). Therefore, it is important to know how such a belief works in different contexts by different users and in different periods of time. Students of higher education are extremely dependent on the information they find on the Web to complete their assignments and projects. Because of the importance of information searching self-efficacy in the community of post-graduate students, who are going to write their thesis and dissertations, the current research was taken into consideration. Understanding how students of the highest level of education feel about their self-efficacy in their information literacy skills would largely shed new lights on the knowledge in fields like designing information retrieval systems, instructional programs for student users, information processing mechanisms, and how a successful search could emerge. Studies have shown that metacognitive strategies, management efforts, interpretation, critical thinking and control beliefs predict different aspects of information literacy self-efficacy (Kurbanoglu, 2003; Çakmak, 2010).

3.2. Social networks and self-efficacy

The findings of the study showed that there is a positive and significant relationship between social networks and self-efficacy of students. Nonetheless there was no significant difference between the age groups. This could be explained from the fact that social networks like WhatsApp and Facebook are open to all learners and do not need prior experience and formal tutoring like the university online learning platform. Hence, students are likely to be equal in the use of open source education search engines. The findings of the present study fall in with those Sobaih and Moustafa (2016) who claimed that social media can be used for the purpose of teaching and learning in higher education. It has an unlimited possibility to be exploited as an idea and information platform for academic-related purposes since students already use these networks.

Lambic (2016) equally did a study with 139 students in Sombor (Serbia) to determine whether there is a relationship between the academic performance of students and the frequency of use of Facebook as a learning aid. He asserted that the frequency of use of Facebook for educational purposes have positive effect on students' academic performance. Kolek and Saunders (2012). found no correlation between GPAs of student users and social network participation such as Facebook. Instead, social network sites (SNS) promotes communications between students and teachers (Ahmed and Qazi, 2011). A study by Fishman, Lunsford, McGregor, and Otuteye (2005) also indicated that through various social media tools, college students create marvellous volume of writings



GENERAL CONCLUSION

1. CONCLUSION

Developments in technology present an opportunity to change the way we educate. The Internet provides a wealth of information, attracting academics and students alike. The personal computer and ease of access to the Internet provide an opportunity to reach ever greater proportions of the population. As education embraces technology as a delivery vehicle, there needs to be a focus on the needs of university student, and the disadvantage they may experience as a result of the additional challenges of new technology (Meyer et al, 1997).

A web of linked factors contributes collectively to the achievement of self-efficacy in the VLE. Overlap of control factors and key areas of change increases the possibility of achieving self-efficacy. And with a sound pedagogical framework that enhances both educator and learner achievements with computer technology, self-efficacy beliefs will be increased. Consequently, self-efficacy in the VLE will leave the mature student better equipped to deal with technology generally and specifically for the purposes of sustained lifelong learning.

Many of these factors are experienced by educators, affecting the quality of their teaching and their use of the VLE to the benefit or detriment of the mature student. The better trained and supported the educator, the better they will be able to support the special requirements of the university student.

This study on self-efficacy in the VLE has as much relevancy to commercial organisations as it does to educational institutions. This is particularly poignant given the lower costs of delivery for independent computer based training in organisational settings. All learners can benefit from increased simplicity and ease of use. Students with special disabilities or special learning needs can achieve greater assistance and satisfaction given these initiatives.

2. LIMITATIONS OF THE STUDY

Despite the positive results found in this study, the following limitations were registered in during the course of research.

- The study adopted a pure quantitative research approach. More information could have been gotten with the use of qualitative data collection tools and methods.
- The study was limited to the faculty of Sciences of Education. More information should have been gotten if other faculties were included.
- Despite the fact that both males and females were sampled, the study did not do a variance in gender in the use of VLE and the self-efficacy of students.
- The study did not take into consideration students with disabilities which could produce different results in relation to self-efficacy

3. Recommendations

- Universities should invest more on virtual learning platforms by providing students with access to internet on campus that can enable them use online platform, search engines and social networks.
- Each faculty of the school should have an IT centre so as to ensure more access to students.
- Orientations on how to use the university online platform should be conducted at departmental level.

4. Suggestions for further research

Based on the present study, the following suggestions can be made for further study.

- A study can be carried out to see the gender variations in the use of virtual learning environments and the self-efficacy of students.
- A study can be carried out to compare the use of virtual learning environments and self-efficacy of lecturers and students.
- A study could be carried out to find out the self-efficacy of students with disabilities in the use of virtual learning environments.



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ANNEXES

QUESTIONNAIRE FOR STUDENTS

My Name is NGO MUTSI MAHI FLORENCE. I am a Masters student of the University of Yaounde, Faculty of Sciences of Education. I am out to carry out research on Virtual Learning Enviroments and Self-Efficacy Belief of Students of The University of Yaounde-I. I guarantee you that the information you supply below shall remain confidential and will be used only for academic purposes.

Kindly place a tick at the box that is most applicable to you. Whereby SD=strongly disagree; D=disagree; A=agree; and SA=strongly agree

S/N	Items	SD	D	A	SA
ONLINE LEARNING PLATFORMS					
1	I am able to register myself into the university online learning platform				
2	I am able to effectively and efficiently manage my account at the university online platform				
3	I can easily access the resources available at the university online platform				
4	I am able to control and monitor my learning process at the online platform				
5	I am able to perform all assignments, tests and examinations at the online learning platform				
6	I can effectively and efficiently communicate well with my lecturer at the online learning platform				
OPEN SOURCE EDUCATION SEARCH ENGINES					
7	I have a knowledge of at least three search engines I can use for educational purposes				
8	I have some search engines installed in my computer or phone for academic use				
9	I am able to browse search engines and get necessary educational information relevant for my studies				
10	Search engines contain enough information that can help me in my studies				
11	I can afford for internet connectivity in order to able to use the search engines				
12	My university provides internet connectivity to enable me access search engines				
SOCIAL NETWORKS					
13	I belong to some social network forums that are used only for academic purposes				
14	I am able to communicate with friends and lecturers on social networks				
15	I can easily access the resources available on social networks				
16	I am able to control and monitor my learning process on social networks				
17	I possess a strong power system gadget that can sustain discussions on social networks without easily de-charging				
18	I can afford for internet connectivity to sustain educational discussions on social network				

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AUTORISATION DE RECHERCHE

Je soussigné, Professeur Moïse MOUPOU, Doyen de la Faculté des Sciences de l'Éducation de l'Université de Yaoundé I, certifie que l'étudiante **NGO MUTSI MAHI FLORENCE** matricule **18X3900**, est inscrite en Master II dans la Faculté des Sciences de l'Éducation, Département *Curricula et Evaluation*, option Ingénieur psychotechnicien.

L'intéressée doit effectuer un stage en vue de l'obtention de son diplôme de Master II. Elle travaille sous la direction du **Pr. ONGUENE CHRISTINE**. Son sujet est intitulé : «*Virtual learning environment and university 1 students self-efficacy belief*.»

Je vous saurai gré de bien vouloir mettre à sa disposition toutes les informations susceptibles de l'aider.

En foi de quoi, cette autorisation de recherche lui est délivrée pour servir et valoir ce que de droit.

Fait à Yaoundé, le 10 AOUT 2020

Le Doyen et par ordre

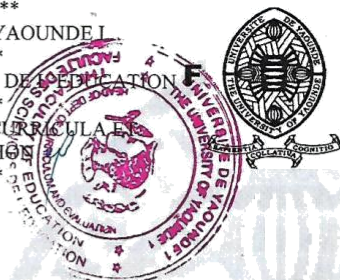

Le Vice-Doyen
ONGO Etienne
Professeur

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Je soussigné, **Professeur Moïse MOUPOU**, Doyen de la Faculté des Sciences de l'Éducation de l'Université de Yaoundé I, certifie que l'étudiante **NGO MUTSI MAHI FLORENCE** matricule **18X3900**, est inscrite en Master II dans la Faculté des Sciences de l'Éducation, Département *Curricula et Evaluation*, option Ingénieur psychotechnicien.

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Fait à Yaoundé, le ..1..0..AOUT..2020..

Pour le Doyen et par ordre


DONGO Etienne
Professeur

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