RE:LEARNING

A foresight study observing implications of ubiquitous computing on the future of learning in higher education

Dione M. Scott

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by

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Abstract

This project aims to visualize possible future scenarios for higher education learning and how it will be transformed through ubiquitous computing. The project draws on the theories of learning, a brief history of higher education, elements of ubiquitous computing and current trends in education, to build a foundation for possible learning changes. The project generated three scenarios that depicted parameters from a morphological analysis. These scenarios take readers to 2035 and give them a creative view of alternative learning landscapes. Three fictional personas are introduced who live within each scenario. Readers are then exposed to possible curricula that encapsulate the changes and the ubiquity of computing in learning and higher education. The aim is to to view learning as a lifelong experience and the currency by which we survive.

Keywords: higher education, learning, ubiquitous computing, lifelong, personalized

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To Dejaughn

For being the most inspirational nephew an aunt could ask for

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Introduction

"He who learns but does not think is lost. He who thinks but does not learn is in great danger."

Confucius

History shows that change is the only consistent element in the world whether or not the change is expected. Humans have to live with changes. The only way to do so is through learning. The learning process, therefore, has to find the right balance between change and stability to provide individuals with the tools and techniques needed to survive. Technology has played a good role as a tool thus far, by providing students from kindergarten to postsecondary level with new ways of managing change. It has resulted in many sources of information, platforms and environments to absorb, discuss, analyze, view, and disseminate information regarding a student's learning journey. As technology evolves and becomes ubiquitous, universities and other learning institutions have to re-envision their teaching and learning process or risk closure.

People learn differently, sometimes the same, in groups, alone, when they are calm, or in a stressful situation, at different speeds and using different processes and skills. The way we learn is messy, non-linear, personal, and adaptable. The human ability to devise solutions, retain information, recall, imagine, and create is utterly fascinating. This fascination fuelled my career as a community college lecturer. During that time, I observed several behavioural, social, economic, and administrative elements that encouraged and limited the teaching and learning process. Barriers to the learning process presented themselves in many ways. They range from colleges and universities providing students with multiple learning paths and processes with 20th-century teaching and learning process for 21st-century students.

Barriers include:

- Inefficient learning outcome assessment process (Ebersole, 2014).
- Student's unpreparedness entering the higher education system that sometimes led to failure, emotional stress, and wrong paths.
- Student's unpreparedness for the world upon leaving the system that leads to skill shortages, mixed matched skills, and simply more wrong paths and a costly system that barred some students from entering and burdened students during and after their time in the system.

These barriers sometimes overshadow the beauty of the learning process and diminish the need for such a noble path. The truth is not everyone may need a college degree but it is clear that learning beyond the secondary level is and will continue to be essential for continued economic and personal growth, to be successful and ensure sustainability.

Higher education is under tremendous pressure to respond to rising challenges due to shifts in funding, economic pressures, and demands for accountability. They have increasing demands to optimize limited resources and provide stakeholders with responsive digital services. Higher education institutions evoke passion in most persons that pass through their doors but there are areas for improvement. According to the National Center for Public Policy and Education, the cost of higher education has grown 440% in the past 25 years in the United States alone. These cost increases have occurred at both public and private colleges. The number of graduates in debt has also increased dramatically worldwide (Williams, 2014). Most higher education institutions still operate in the traditional lecture model. A model, Carnes (2011), says promotes passive, rather than active learning, while students feel lost, bored and ignored. Many institutions have started to incorporate online teaching, coding, design, maker labs, augment reality amongst other techniques into their routine yet still holding on to their traditional teacher-student roles. This hinders innovative and personalized models from being fully implemented. Another major issues arising is whether students actually acquire valuable skills. Curricula and degrees are based on a credit system designed to be delivered during a set time (semesters) frame no matter the discipline. They appeal to the masses and do not fully conform to the student. Leading firms such as Google have shown that they would rather hire individuals that demonstrate real competence than employ college graduates with high GPAs (Weinreich, 2014; Friedman, 2014). de Botton, 2015 believes that employers may find that individuals possessing certificates indicating several computer skills may be of greater value to their organizations than individuals with a computer degree from a top university.

This research aims at using a foresight approach to extrapolate concepts, while exploring the vast body of work done in the higher education space, which can make higher education sustainable, more aligned with the working world and break free of the four-walled model. It aims to review some trends that influence learning, higher education, and ubiquitous computing. By using foresight techniques to envision possible future scenarios of learning in the higher education space of 2035, this paper aims to forge strategies that could possibly be implemented today that can either preempt or enable the challenges or opportunities that arise in the scenarios. The research will discuss the social, pedagogical, and technological elements within higher education, allowing the reader to imagine possible future settings.

Research Questions

The research was guided by the following research questions:

How can learning through the help of ubiquitous computing adapt and transform to create better outcomes for students in higher education?

What are possible futures for learning given the implications of ubiquitous computing?

How will feedback be structured and delivered in the future and how would we measure its effectiveness?

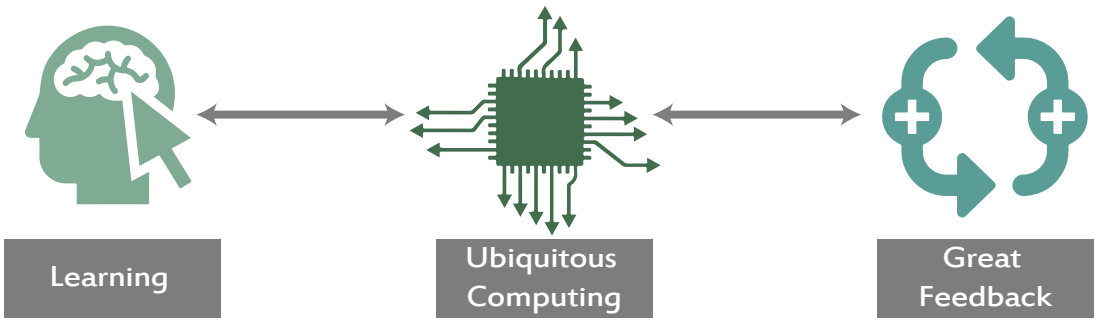


Figure 1| Research Questions Elements

Methodology

A qualitative and foresight approach was suited for the research as it produced unique methods that aided in the understanding the past, present and possible future layers of the learning process in the higher education system, the effects of ubiquitous computing, and developing vignettes of the future. A qualitative approach uncovers trends in thought and opinions, and dives deeper into the problems. Qualitative methods provide rich, contextual explorations of the topic that are often personally or culturally meaningful (Monfared & Derakhshan, 2015).

Foresight is the "human capacity which allows people to think ahead and consider, model, create and respond to, future eventualities" (Slaughter, 2006). It is a dialogue or debate about futures. Foresight methodologies are frameworks for making sense of data generated by creating structured processes to think about the future. Foresight methodologies create unique solutions in the strategy development process (Conway, 2009). Foresight methodologies can be classified into four levels (Voros, 2003) or by the cone of plausibility. During this project, we focused more in the Prospective and the Alternative futures.

The four levels are:

- Input: what is going on?
- Analytical: what seems to be happening?
- Interpretive: what is really happening?
- Prospective: what might happen?

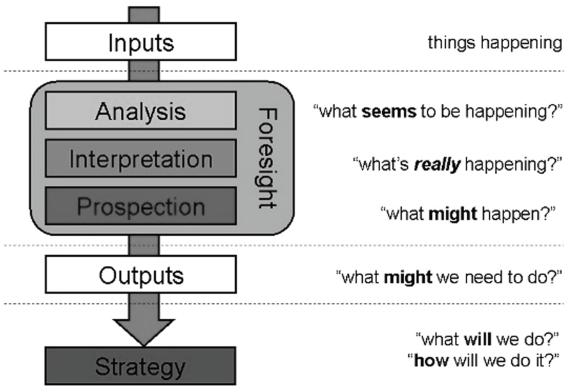


Figure 2| General Foresight Process
(source: http://thinkingfutures.net/framework/)

The cone of plausibility refers to:

- What is going to happen? Expected future
- What might happen instead? **Alternative futures**
- What do you want to happen? Preferred future(s)

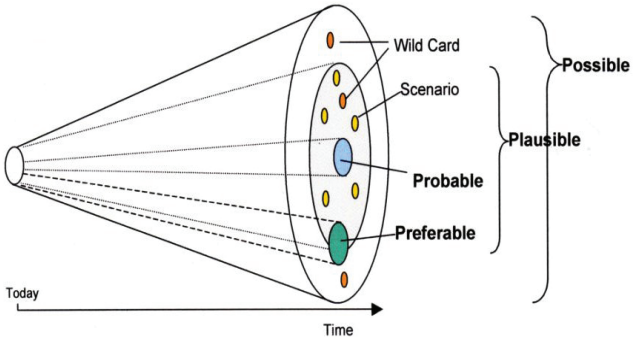


Figure 3| Cone of Plausibility
(source: http://lib.fo.am/future_fabulators/scenario_methods

Methods used

Literature Review

A literature review according to Beanland, Schneider , LoBiondo-Wood , & Haber, 1999 is a "broad, scholarly, comprehensive, in-depth, systematic, and critical review of scholarly publications, unpublished scholarly print material, audio-visual material, and personal communication." A literature review can be a stand-alone form of qualitative research in itself. It is an iterative process in the qualitative research that helps to formulate new questions and concepts. The main purpose of this literature review is to impart to the readers the ideas, information, and knowledge recorded about learning, the future of higher education and ubiquitous computing.

Environmental Scanning

This research will utilize the trends in the higher education system to build rich stories. Environmental scanning is a great tool to that can be used identify such trends. Environmental scanning is the art of systematically exploring the external environment to understand the nature and pace of change in that environment. This process explores both new, strange, and weird ideas, as well as persistent challenges and trends today. Environmental scanning is what Choo, 1998 calls formal searching, using formal methodologies for obtaining information for a specific purpose. It is systematic. It is more than reading newspapers or industry journals, or checking the latest statistics about your market. It is about exploring both present certainty and future uncertainty, and moving beyond what we accept as valid ways of doing things today. Some terms used in environmental scanning are events, trends, drivers of change and worldview. Events are something happening in the environment that can be observed or tracked, example super storms. Trends are a grouping of similar or related events that tends to move in a given direction, example technology use, consumer behaviour. Drivers of change are the force moving trends in certain directions, broad in scope and long term in nature, example globalization. Worldview is the way we see the world and make meaning of what you see. For this research, the focus is on trends in the higher education system (Conway, 2009).

Scenario Development using Morphological Analysis

Scenario development helps to clarify the landscape of change by offering diverse, coherent glimpses of possible future conditions affecting learning in the higher education system in 20 years. A morphological analysis can be used to develop such scenarios. According to Ritchey 2009, a morphological analysis is a method for meticulously structuring and investigating the total set of relationships in inherently

non-quantifiable socio-technical problem complexes. The method develops discrete parameters (morphological field) based on the problem, and defining relationships between the parameters and the variables making up the parameters. This method can be performed with or without computer support to manage the vast amount of relationship or inferences. For this research, there was no computer support.

The Past

Literature Review

The literature review gives the backdrop to the study by giving a description of learning, education and learning theories that have helped shaped pedagogy in higher education. It goes further to explain the history and concept of higher education and ends with the definition and concepts surrounding ubiquitous computing and its influences on higher education thus far.

Learning

Learning is the knowledge or skill acquired by instruction or study (Learning, n.d.). Shuell, (1986) defined learning as "an enduring change in behaviour, or in the capacity to behave in a given fashion, which results from practice or other forms of experience." Driscoll, (1994) referred to learning as a persisting change in human performance or performance potential. When one thinks of learning the terms education and educate comes to mind. These terms are often used interchangeably despite their differences. Education is the field of study that deals mainly with methods of teaching and learning in schools (Education, n.d.). It is often linked to a more formal academic background. Educate refers to training by formal instruction and supervised practice especially in a skill, trade, or profession, to develop mentally, morally, or aesthetically especially by instruction, or to provide with information (Educate, n.d.). Learning is, therefore, a process that encompasses education (Jensen, 2001) and for that reason, we will be using it in its overarching sense throughout this paper.

Theories of learning

Greek philosophers Socrates, Plato and Aristotle all had their own theories of learning that helped to establish the western form of learning. Socrates developed the dialectic method of discovery through conversations with fellow men, Plato believed that learning happens through a self-reflection method, and Aristotle believed in learning through a scientific method of studying data from the world around us (Monroe, 1925). Their ideas regarding learning passed down through centuries has been the basis and inspiration for many theories of modern philosophers and educators. Modern philosophers went on to describe their views of learning and education. Dewey (1938) stated that the primary purpose of education is not so much to prepare students to live a useful life, but to teach them how to live pragmatically and immediately in their current environment. Counts (1978) stated that the purpose of education was more about preparing individuals to live as members of a society and have good social conduct thus improving their communities. Adler (1982) combined the views of both Counts and Dewey and suggested that there are three objectives of a child's education. They are the development of citizenship, personal growth or self-improvement, and occupational preparation. There is no shortage of scholars who tried to define the purpose in their own way. deMarrais & LeCompte (1995) stated that education has four major purposes; intellectual, political, economic and social purposes.

The philosophers and scholars mentioned are only the start of the many theories developed on learning and education. These theories help develop the learning systems we know today. However, the question remains, how do we learn? With this question answered, we can better develop tools and techniques to ensure that the future of learning is accomplishing its goals. However, there is still no definite answer. There likely will never be a definite answer. The best tools we have are complementary models and theories that help us understand different parts of learning and the vision to combine these tools.

Seven theories of learning explored during the research are behaviorism, cognitivism, social learning theory, social constructivism, multiple intelligences, brain-based learning, and connectivism. These theories cover a wide range of ideas around movement, collaboration, the power of the brain, the reflexive nature of learning, technology, and many other elements. During the research, I found that these theories combined into one major plan could form the basis of an adaptive learning plan for students. Many higher education institutions incorporated only a few theories. The success of higher education in the future may be shaped by how these theories are used and reengineered. To understand these the reasoning behind these seven theories below is a brief description of each.

Behaviorism theories conceptualize learning as a process of forming connections between stimuli and

responses (Bransford, Brown, & Cocking, 2000). Behaviorism focused on classic conditioning by Pavlov and operant conditioning by Skinner. Classic conditioning involves learning a new behaviour by the process of association, a reflexive process. Operant conditioning states that humans' motivation to learn is driven primarily by drivers, such as hunger, and external forces, such as rewards and punishments (Skinner, 1950). This theory resulted in a highly structured lecture-based system with a one-size fits all methodology.

Cognitivitism theory grew as a response to the downfalls of behaviorism and refers to the study of the mind and how it obtains, processes and stores information (Stavredes, 2011). It is based on the cognitive science approach to learning from a multidisciplinary perspective that includes anthropology, linguistics, philosophy, developmental psychology, computer science, neuroscience, and several branches of psychology (Norman, 1993). Cognitivism teaches that learning is the process of connecting symbols in a meaningful and memorable way. It explores the mental processes of thinking, memory, knowing, and problem solving. It encourages curiosity and testing of hypotheses.

Social learning theory is the theory that learning takes place through observation and sensorial experiences. Bandura, (1971) stated that most human behaviour is learned observationally through modeling; from observing others, one forms an idea of how new behaviours are performed, so in later occasions this coded information serves as a guide for action. Social learning results in more collaborative learning styles where observation of experts and peers are encouraged.

Social Constructivism or constructivism theories are two similar theories developed by Lev Vygotsky (Social Constructivism) and Jerome Bruner (Constructivism). Both Bruner and Vygotsky emphasise the importance of a child's environment, especially the social environment. Both agree that adults should play an active role in assisting the child's learning. Bruner introduced the process of scaffolding and Vygotsky introduced zone of proximal development. Scaffolding refers to the steps taken to reduce the degrees of freedom in carrying out some task so that the child can concentrate on the difficult skill he/she is in the process of acquiring (Bruner, 1978). It involves helpful, structured interaction between an adult and a child with the aim of helping the child achieve a specific goal. The zone of proximal development refers to "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through of scaffolding. Problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978). Social constructivism paints learning as more of a social activity where learning is a search for meaning and the responsibility of the learner. There is much dialog and recursive behaviours. Lev Vygotsky suggests that learning should be perceived as an active, not a passive, process, where knowledge is constructed, not acquired. Examples of this form of learning activities would be

experiential learning, journaling and collaborative and cooperative learning.

Multiple intelligence theory (MIT) stemmed from Howard Gardner's research, which shows that human cognitive ability is pluralistic, not unitary. Gardner stated that learners of any subject would make greater progress if they have the opportunity to use their areas of strength to master the given material. Learning considered by some as only a cognitive activity has led to narrowed concept of educating from the neck up. Learning involves the physical, emotional, and cognitive sides of an individual (Arnold & Fonseca, 2004). Gardner, (1983) identified eight intelligences we used in learning:

1. Verbal – Linguistic Intelligence
2. Mathematical – Logical Intelligence
3. Visual – Spatial Intelligence
4. Intrapersonal Intelligence
5. Bodily – Kinesthetic Intelligence
6. Interpersonal Intelligence
7. Naturalist Intelligence
8. Musical – Rhythmic Intelligence

This theory is sometimes linked to that of the multisensory approach, "also known as VAKT (visual-auditory-kinaesthetic-tactile). It implies that students learn best when information is presented in different modalities". This approach integrates sensory activities. It is an eclectic approach, which teaches students regardless of their preferred learning style (Murphy, 1997). Ideally, all four learning styles should be addressed equally.

Brain Based Learning theory is motivated by the general belief that learning can be accelerated and improved if educators base how and what they teach on the science of learning, rather than on past educational practices, established conventions, or assumptions about the learning process. The focus of this theory is on neuroplasticity. This concept shows that neural connections in the brain change, remap, and reorganize themselves when people learn new concepts, have new experiences, or practice certain skills over time. This theory backed by scientific evidence, has determined that the brain can perform several activities at once. That the same information can be stored in multiple areas of the brain; that learning functions can be affected by diet, exercise, stress, and other conditions. That meaning is more important than information when the brain is learning something new; and that certain emotional states can facilitate or impede

learning—among many other findings (Brain Based Learning, 2013).

Connectivism theory is a new theory that delves into the integration of principles explored by chaos, network, complexity and self-organization theories. It is proposed as the learning theory of the digital age. Siemens 2005 states that learning is a process that occurs within nebulous environments of shifting core elements and not entirely under the control of the individual. He went further to say that learning can reside outside of the individual such as in non-human appliances, databases, organizations, etc. It rests in the diversity of opinions and the capacity to know is more critical than what is currently known and make connections between elements others may never think of connecting.

Learning and teaching terms derived from theories

These theories led to various teaching and learning practices in education systems all over the world. They influenced many pedagogies and curriculums. These are the areas of the theory that are closest to students and the area within which the research hopes to direct some focus. Pedagogy is the 'appropriate way of teaching and giving assistance to children and young people' (van Manen, 1999). It deals with the proper ways teachers and learners interact. The relational, emotional, moral, and personal dimensions of the teaching/learning process are an integral part of the notion of pedagogy (Smith & Lowrie, 2002). Andragogy defined by (Knowles, 1980) is "the art and science of helping adults learn," was contrasted with pedagogy, the art, and science of helping children learn. This became important when educators tried to differentiate adult education from other areas of education. In the higher education system, the concept of andragogy is becoming necessary, as the age of students has increased dramatically. This approach helps the higher education transition into a lifelong learning system in the future. Andragogy makes five assumptions about the adult learner. One, they are independent and can direct their own learning. Two, they have accumulated a reservoir of life experiences that is a rich resource for learning. Three, they have learning needs that are closely related to their changing social roles. Four, they are problem-centered and interested in the immediate application of knowledge. Five they are motivated to learn by internal rather than external factors (Merriam, 2001).

Curricula are important for organizing higher education. They refer to the lessons and academic content taught in a school or in a specific course or program. A curriculum specifies the knowledge and skills students are expected to learn. This includes the learning standards or learning objectives they are expected to meet; learning outcomes that students will know and be able to do at the end of going through the curriculum. It

education also includes teacher-training schools, junior colleges, and institutes of technology (Britannica, Higher Education, 2016). The word university is derived from the Latin universitas magnistrorum et scholarium which denotes any community or corporation regarded under its collective aspect, basically a community of teachers and scholars (Ponnusamy & Pandurangan, 2014). The earliest form of higher education institution arose out of efforts to educate clerks and monks beyond the level of the cathedral and monastic schools. Until the end of the 18th century, most Western universities offered a core curriculum based on the seven liberal arts: grammar, logic, rhetoric, geometry, arithmetic, astronomy, and music. Students then proceeded to study under one of the professional faculties of medicine, law, and theology. Final examinations were grueling, and many students failed (University, 2016).

In the 18th and 19th centuries, religion was being slowly displaced as the main topic as European universities became secularized in their curriculum and administration. The German model of the university with graduate schools performing advanced research and experimentation proved to have a worldwide influence. American colleges and universities imitated German models, seeking to combine the ideal of academic freedom with the idea of educational opportunity for the masses. Women began to be admitted to universities in the second half of the 19th century. Meanwhile, universities' curricula also continued to evolve. The study of modern languages and literature was added to the traditional study of Latin, Greek, and theology. Sciences such as physics, chemistry, biology, and engineering started to creep in and by the early 20th century, the newer disciplines of economics, political science, psychology, and sociology were also taught (University, 2016).

Objectives of higher education

As higher education institutions increased in numbers and became more accessible to students, they started to change their objectives to appeal to unique individuals. Public institutions emphasized their roles in providing services to the community or regional areas, economic development, and preparing graduates for the local and regional workforce. They aimed for individuals who sought to increase economic attainment through education (Hannay, 2014, as cited in Saichaie & Morphew, 2014). Private institutions highlighted the importance of student development and the liberal arts. Less selective institutions marketed themselves to prospective students on the strength of their connections to employers and the ability to provide students with job-relevant skills. Elite institutions emphasized their students' intensive learning experiences and linkages to well-known faculty (Klassen, 2001; Hartley & Morphew, 2008; Taylor & Morphew, 2010). Overall most institutions objective is to aid students in developing their social capital. Developing social capital (e.g. networking and mentorships) contributes to furthering learning and its associated productivities beyond the

also includes the units and lessons that teachers teach; the assignments and projects are given to students; the books, materials, videos, presentations, and readings used in a course; and the tests, assessments, and other methods used to evaluate student learning (Abbott, 2014).

Learning in Higher Education

Brief History

Throughout history, we see where the higher education system has always been; evolving based on the eras main ideas and topics, and in some eras drastic changes. Higher education is a form of social structure used for the control of advanced knowledge and techniques. The need for education and going to college is a message that is stressed by almost every country and scholarly individuals (Clark, 1983). Modern higher education strives to serve a wide range of learners, providing a good return on investment for the learner, businesses, and the society. While doing so it strives to continuously improve through research and development and feedback (Dede, 2013). Clark 1983 explored a few concepts of the university (higher education) from several individuals' perspective as shown below.

In the early nineteenth century, Germany Wilhelm von Humboldt established the basis for the modern German university and that was that universities were the centre of discovery of knowledge. It is a storehouse of knowledge. In the mid nineteen century, Cardinal Newman of Great Britain established the claim that the university is a place for conserving and teaching universal knowledge, that its "object" cannot be discovery or utility but rather the diffusion of eternal truths. In the mid twentieth century, Robert Maynard Hutchins stated, "a university is an intellectual community of people … who are trying to understand major issues that confront and are likely to confront mankind."

These small differences between Humbolt, Newman and Hutchins shows fundamental tension around the purpose of higher education, with roots down to secular (Humboldt and Hutchins) and religious (Newman) educational context. Such fundamental tensions have always been present in education, under different guises. Looking towards the future, we can almost certainly see a continuation of fundamental changes that will lead to altering policies, subjects, theories, and methods.

Higher education institutions include not only universities and colleges but also various professional schools that provide preparation in such fields as law, theology, medicine, business, music, and art. Higher

initial educational experiences (Dede, 2013).

The advent of Massively Open Online Courses (MOOCs) and Do-it-yourself videos have helped in declining higher education enrollments and many higher education institutions became sensitive to their new tuition dependent reality. In spring 2015, overall postsecondary enrollments within the US decreased 1.9 percent from the previous spring. Enrollments decreased among four-year for-profit institutions (-4.9 percent), two-year public institutions (-3.9 percent), and four-year private non-profit institutions (-0.2 percent). Enrollments increased slightly among four-year public institutions (+0.1 percent). As a whole, public sector enrollment (two-year and four-year combined) declined by 1.7 percent this spring (National Student Clearinghouse Research Center, 2015). Prospective students have started to exploit the new supply-demand mismatch and assert themselves as consumers of specific academic and non-academic programs. Therefore, many institutions had to re-envision their objectives to emphasise the importance of intellectual and personal development and their ability to get students high-quality jobs with leading companies as their main reason for learning at a post-secondary level (Saichaie & Morphew, 2014).

Other objectives of higher education that have survived today are teaching, research and community service (Clark, 1983). There are a few long-standing assumptions that have shaped the objectives of higher education. Social restructuring, globalization, and technology are helping to shift some of these assumptions. Dede`s (2013) summary of a workshop sponsored by National Science Foundation on the shifts in higher education showed that higher education objectives are:

- Moving from thinking about expertise as something an expert knows and can articulate to thinking about expertise as a complex mix of unspoken and conscious competencies.
- Moving to knowledge that is localized in the student's mind to a distributed understanding and performance. Today`s expertise now includes elements of technology that support finding essential information rather than remembering it. Mastery in this space, therefore, involves decisions about when to make use of such tools and when they are not sufficient.
- Moving from a focus on memorizing and applying facts, concepts and procedures to higher level conceptual and analytical skills that are adaptable in a diverse context.
- Moving from cognitive only emphasis to an equal emphasis on cognitive and non-cognitive factors. Some of these non-cognitive factors based on research from social and development psychology are persistence, grit, engagement, all substantial for learning.

Ubiquitous Computing

Technology has provided the means for learning overall to be more adaptable and for educational systems to achieve greatness beyond the imaginable objectives. It has the ability to create the world where an individual is not stuck in one learning system, but the world where the learning system evolves with the learner as they evolve as intelligent beings. Ubiquitous computing sometimes called pervasive computing is one such element of technological advancement that has and will continue to create these possibilities.

Ubiquitous is the concept of existing or being everywhere especially at the same time (Ubiquitous, n.d.). Mark Weiser, the person who coined the term 'Ubiquitous Computing' in 1988 wrote, "The most profound technologies are those that disappear because they weave themselves into the fabric of everyday life until they are indistinguishable from it" (Weiser, 1999). Weiser defines ubiquitous computing as an environment in which the computer is integral to and embedded in the background of daily life. Ubiquitous computing is fundamental to the descriptions of cyber-infrastructure evolution. Cyber-infrastructure is the integration of computing, data and networks, digitally-enable sensors, observatories and experimental facilities and an interoperable suite of software and middleware services and tools (Dede, 2008).

Most people today have their brigade of personal devices such as smartphones, tablets, smart watches, smart TV etc. but is this ubiquitous computing in action. Rosenheck (2008) using Weiser's approach gave three points to label technologies as ubiquitous. One, devices should be able to connect to each other and communicate. Currently, many of these devices can communicate if they are on the same platform, for example, the Apple IPhone and the Apple Watch. However, outside of the Apple platform communication is not convenient, as it currently does not allow for full cross-platform collaboration. Two, computers are ubiquitous if they do not need to be carried on a person but become part of the environment. The Internet of Things is Weiser's dreams in realization. Cisco predicts that by 2020 over 50 billion things will be connected and able to deliver the right information to the right people, efficiently and effectively. Three, devices screens or interfaces should be readily available in the user's peripheral attention as well as focused attention. Virtual reality demands the users' full attention and takes them out of their world into another. Today with augmented reality, we are able to superimpose the virtual world onto the real world and therefore achieve the peripheral attention envisioned by Weiser & Brown, 1995.

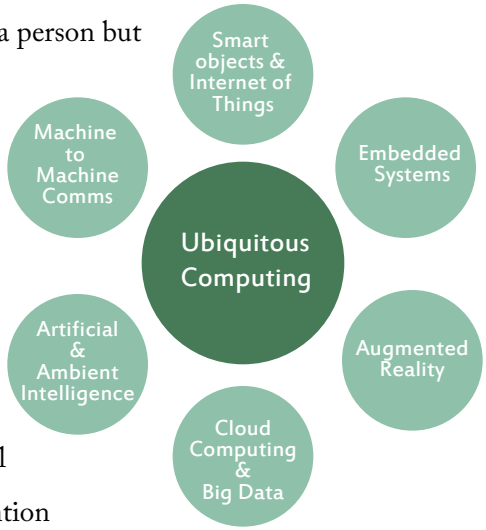


Figure 3| Elements surrounding Ubiquitous Computing

For ubiquitous computing to be embedded everywhere and programmed to act automatically with little or no manual trigger, an enabling environment needs to function. Figure 2 shows some elements that can enhance the ubiquitous computing experience:

- Smart objects are able to interact, through sensors, with the physical world by performing limited forms of computation as well as communicate with the outside world and with other smart objects (Vasseur & Dunkels, 2010). The term Internet of Things refers to the combination of three distinct ideas: a large number of "smart" objects, all connected to the Internet, with applications and services using the data from these objects to create interactions (Hoy, 2015).
- An embedded system is a computer embedded in something other than a computer. Any system that has a microprocessor is an embedded system with the exception of PCs, laptops, and other equipment readily identified as a computer (Vasseur & Dunkels, 2010).
- Ubiquitous Computing and Augmented Reality (AR) linked strongly together. Augmented Reality (AR) is the presentation of electronic information along with a real-world object, projected physically or as seen through an electronic display (Begole, 2010).
- Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, and services) that can be rapidly supported and released with minimal management effort or service provider interaction (Mell & Grance, 2011). Big data refers to huge data sets that are larger; more diverse includes a variety of structured, semi-structured, and unstructured data, which is faster. Big data allows us to discover patterns, derived meaning, and to make decisions with greater intelligence and predictive analytics (Intel, 2015). Clouds offer flexibility and efficiencies for accessing data and enriching the possibilities of big data analytics.
- Artificial intelligence is a field of study that seeks to explain and emulate intelligent behaviour in terms of computational, automated processes (Schalkoff, 1990 cited in Russel & Norvig, 1995). Ambient Intelligence refers to the concept of enriching an environment with technology (mainly sensors and devices interconnected through a network). Ambient Intelligence has a decisive relationship with many areas in computer science as shown in figure 4.

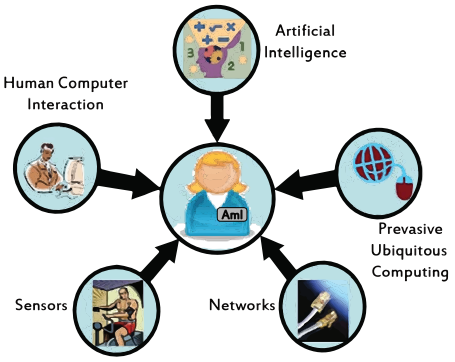


Figure 4| Relationship between Ambient Intelligence and other areas (source:http://www.seminarsonly.com/IT/Ambient-Intelligence.php)

- Machine-to-machine (M2M) communications used for automated data transmission and measurement between mechanical or electronic devices. The standardization and development of appropriate machine-to-machine interface are extremely important for ubiquitous computing systems to interacting components (Santos & Block, 2012).

How ubiquitous computing has transformed higher education

As ubiquitous computing grew, the education system adopted the technologies and more personalized and innovative education spaces emerged. Laru, Naykki, & Jarvela (2014) analyzed the four eras of the educational use of ubiquitous computing (see figure 4). The first era of research on the educational use of ubiquitous computing centered on mobility and the educational use of three distinct types of mobile devices: laptops, personal digital assistants (PDA), and scientific calculators. The results showed that these devices increased collaboration and cooperation.

The second era dawned the wireless Internet learning devices coupled with pedagogically ambitious learning goals. Researchers in this era focus on bridging the digital divide and enabling persons in developing countries to access and contribute information via the Internet. This era emphasized the learner's engagement. Roschelle & Pea (2002) predicted that there would be tensions between traditional learning models, which are highly centralized, with mobile technologies that are collaborative and distributed. This tension came because educational technologists tend to create applications designed to work within inherited educational ideas rather than to transform them (Squire & Dikkers, 2012). Another prediction by Roschelle & Pea, (2002) was that mobile technology might revolutionize the role of teachers by breaking the contrastive teaching paradigms of teacher-centered instruction (sage on the stage) and teacher-guided discovery. They offered the idea of a "conductor of performances," facilitator or coach (Laru, Naykki, & Jarvela, 2014).

The third era is that of the social mobile learning. Social media has created new ways to participate in educational activities. Mobile social media a term coined by Multisilta & Milrad, 2009 describes the integration and interplay between these two emergent technologies. By using mobile social media, students' works transform into artifacts (Roschelle & Pea, 2002). Social media tools create learning activities that are personalized, group, or a combination of the two where mobile devices are used as an integral part of a pedagogical design consisting of individual and collective learning activities (Laru, Naykki, & Jarvela , 2012). The challenge of this era was to integrate these new technologies into more or less traditional learning methods, curricula, and normal everyday school life. The increasing use of social mobile media in education is

blending formal and informal learning contexts, bridging individual, and social learning, towards seamless learning (Laru, Naykki, & Jarvela, 2014).

We are now on the cusp of the fourth era, which can be called the ubiquitous tomorrow. Here the learning environment is consisting of an amalgamation of tools around every corner. New technological tools fit more readily and naturally into our lives; increasingly broad, inexpensive, and easy access to Internet wireless devices and a variety of Web-based personal publishing and social software tools are making computing truly a ubiquitous, continuous part of our lives. Current trends are also increasingly focusing on effective personal learning environments. This era allows us to benefit from the concept of distributed intelligence and on-demand learning (Laru, Naykki, & Jarvela, 2014).

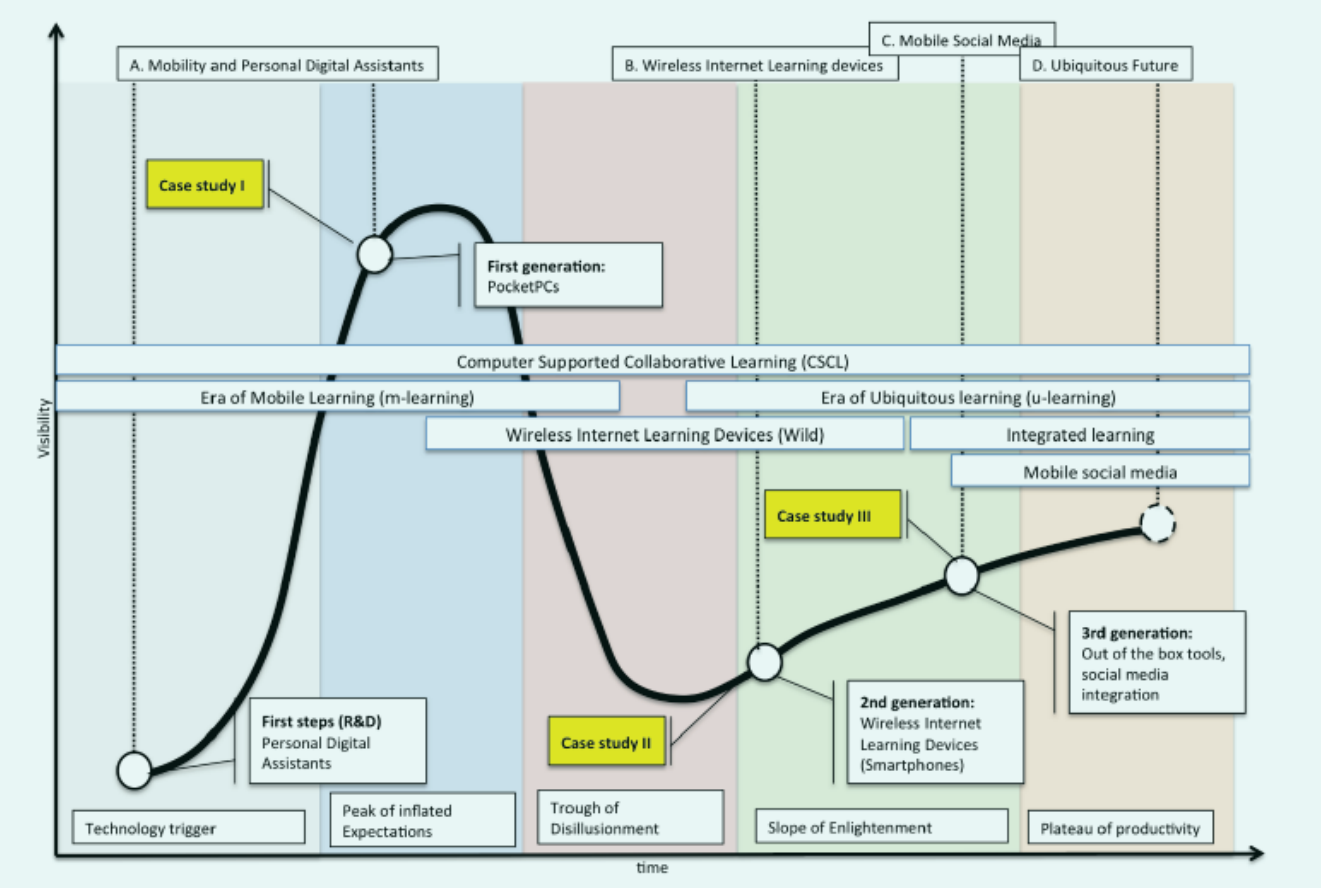


Figure 5| Gartner's hype curve and the development of mobile learning (source: Laru, Naykki, & Jarvela, 2014)

The Present

Environmental Scanning

To identify trends in higher education an environmental scanning process was employed. Scanning provides strategic intelligence to the strategic planning process by identifying changing trends and potential developments, monitoring them, forecasting their future pattern, and assessing their impacts. When developing scenarios, trends can be a powerful tool for developing robust content; content that can erase prejudices and open minds by exploring and combining far-reaching developments that might affect the environment and conditions in which education takes place. These trends help readers to see current happenings and help them start to imagine what could possibly take place in the future (Conway).

The framework STEEP (social, technological, economic, environmental, and political) categorizes the trends below. The STEEP structure is used for scanning developments in the external (contextual) macro environment (Conway, 2009). This is a mental framework for understanding the complex web of change within learning, higher education, and technology. It helps to refine and categorize elements to create scenarios. Signals provide evidence of the trends in everyday life.

Figure 6| STEEP Framework

Trends

Personalized to your liking

Customizable learning that adapts to you, your moods, preferences, and stage in your life. Personalized learning is one where the learner is the focus and not the institution. It is a tailor-made form of learning that even if you are in a crowd and there is only one teacher each individual's learning pace is adhered to, the content is disseminated differently and no one process looks the same. This trend has become more prominent due to the advances in technology and the reduction of the cost of technological tools. "Personalized learning is rooted in the expectation that students should progress through content based on demonstrated learning instead of seat time. By contrast, standards-based accountability centers its ideas about what students should know, and when, on grade-level expectations and pacing" (Hyslop & Mead, 2015). Personalization leads to better understanding and ownership of one's learning and learning environment.

Signals

- Interactive E-book Learning System (IELS) developed for elementary school children personalizes learning functions, such as e-annotation and bookmarks, content searching, and learning process tracking. One hundred and sixty-six elementary school students were involved in the study that tested for usability, functionality, etc. The results showed that IELS was well suited for most of the students (Huan, Liang, Su, & Chen, 2012).
- McGraw Hills e-textbook 'Smartbooks' provides an adaptive learning experience by asking questions and continuously adapting the content based on the student's knowledge (Santos A. , 2013).
- Facial analysis software spots struggling students learning java code in real time. Researchers at North Carolina State University used video cameras to monitor the faces of college students participating in computer tutoring sessions. Software matched facial expressions with different levels of engagement or frustration and when students were experiencing difficulty and when they were finding the work too easy. With these technologies, work can be easily adapted to the students pace (Knight, 2013).

Blended learning styles

Blended learning supports all the benefits of e-learning including cost reductions, time efficiency and location convenience for the learner as well as the essential one-on-one motivation that face-to-face instruction presents (Brown, 2003). It is viewed as an 'organic

integration of thoughtfully selected and complementary face-to-face and online approaches and technologies' (Garrison & Vaughan, 2008). Blended learning can bridge the gap between students and teachers and between students and students. Healthy interactions amongst students can be built and maintained with the diligent use of these methods (Garrison & Kanuka, 2004). In a study completed by Waha & Davis, 2014 the aspects of blended learning that students enjoyed and appreciated, included having permanent access to material online, flexibility in terms of location and scheduling, online interaction and the teachers' availability. Students who dislike this method cited lack of self-motivation as their main reason.

Signals

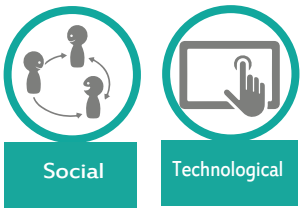
- Stanford University has a self-paced enrichment program for gifted youths. They introduced live eLearning programs and saw a 94% completion rate. The success credited to the now blended learning opportunities (Singh & Reed, 2001).
- Classes have started to embrace the blended learning mode as in that of a sixth-grade science classroom in Michigan. This class used an app called LessonLauncher written in HTML5.

Social learning as pedagogy- Self-organized learning

Social learning allows students to learn more through peer collaboration, on social media sites, through social games, communities, cloud computing, etc. The aim of social learning is to engage thousands of people in productive discussions and the creation of shared projects, so together they share experience and build on their previous knowledge (Sharples, et al., 2014). The idea of group work is not a new concept but the emphasis on the Internet and social media platforms has changed the process of social learning, the adoption rates, and the wiliness of students to do so. It has also allowed students to self-organize.

Signals

- Schools enhanced learning management platforms, which facilitates more social interactivity, for example, Schoology[5].
- Cisco Project Squared is an example of a serviced that offers an online gathering place for work and learning.
- The School in the Cloud platform helps students prepare for the future by using Self-Organised Learning Environments (SOLE)[6].

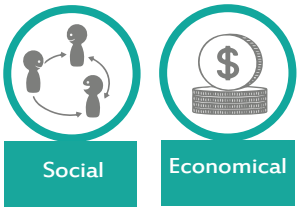


Gamification in learning

Gamification is the use of game mechanics, dynamics, and frameworks to promote desired behaviours (MacMillan, 2011). According to Gee (2008) gamers voluntarily invest countless hours in developing their problem-solving skills within the context of games. Gamification attempts to harness the motivational power of games and apply it to real-world problems. Games provide complex systems of rules for players to explore through active experimentation and discovery. They invoke a range of powerful emotions, from curiosity to frustration to joy (Lazzaro, 2004). These behaviours will enrich the learning process.

Signals

- ClassDojo[10] provides interactive game mechanics for students to become more aware of their achievements and understand their behaviours when learning16.
- Classcraft[11] can also be used for teachers to help manag,e motivate and engage students through role-playing games.



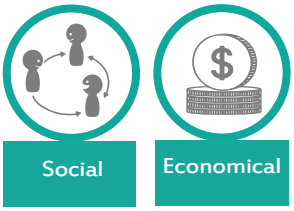
Unbundling education

Industries such as music have been unbundled by technology in the last decade. Higher education is also one on the horizon to be unbundled. Unbundling of education would entail the breakup of the composite structures comprising schooling. Schools take on the role of a connector or general contractor and convene different organizations that excel in teaching various subjects, rather than every subject (Deloitte, n.d.). We have started to see the unbundling of courses, content, credentialing, campus life, personal growth, and more. This will affect everyone from the administration to the students.

Signals

- 2U and Academic Partnerships work with universities to provide certain functions such as admissions, recruitment, and placement of students, in addition, to support services for professors to create online content (Agarwal, 2013).
- New providers have unbundled the components of a postsecondary degree or certificate by offering stand-alone courses or paths, targeted job training, and assessments and certifications. Massively Open Online Courses (MOOCs) and free micro-lectures (e.g. Khan Academy) are creating an alternative, affordable, DIY education route. Educational products from General

Assembly, YouTube training and freelance websites like Elance offer over 1,000,000 job and task specific courses that verify skill competency.



Skill-specific - No degrees necessary

There have been signs of businesses decreasing the emphasis on degrees following concerns that requiring a degree and recruiting from particular universities was producing too narrow a range of staff (Coughlan, 2016). More programs have started to focus on micro-credentialing and offering skill specific learning. Students learn technical skills or knowledge in specific topic areas measured by criteria-specific performance need for the working world.

Signals

- Penguin, Deloitte, Ernst and Young are among the companies that are changing their recruitment process. Applicants have less academic requirements when entering the job market. Some companies like Penguin have scraped degrees requirements to apply for a job with them (Coughlan, 2016).
- Online learning companies such as Lynda, edx, HackReactor and General Assembly[2] increasing their focus on skill specific training sought by employers.

Virtual reality - real world capability

"Virtual reality is a multi-dimensional human experience, which is totally or partially computer generated and can be accepted by those experiencing the environment as consistent" (Seidel & Chatelier, 1997). With the use of software, artificial environments simulate real world settings for users. Users feel fully immersed the world. Even though virtual reality has been linked to the gaming and entertainment industries its use in education and learning is becoming much more evident. Military training and medical school training are just a few examples where virtual reality is being used currently.

Signals

- Online learning has been a one-way street with little interaction. The Center for Online Innovation in Learning has created a way to incorporate Immersive Virtual Reality (IVR) systems such as the Oculus Rift into online teaching (Mester, 2015).
- CLEV-R (Collaborative Learning Environment with Virtual Reality) is a web-based multi-user 3D environment that offers real time teaching with multiple points of interaction between students,

tutors and their peers. It provides an area for text-chat, voice communication, a web-cam into the 3D environment mimic a real university (Monahan, McArdle, & Bertolotto, 2006).

- The Google Cardboard[1] cost between $10 to $20 US dollars each. The headset made out of foldable cardboard where you can fit your smartphone and special lenses inside. The wearer looks through lenses to a three-dimensional image or YouTube 360 video in the Google Cardboard app. Other examples of virtual reality gear are Facebook with Oculus, & Surreal vision, Microsoft with Kinect and Hololens, Google with Cardboard Glass, Google glass, and magic leap, and Samsung with Gear VR.

Artificial Intelligence (AI) assisted learning

AI-assisted learning can change learning on many frontiers. It can automate the grading system, enable adaptive learning, and provide students with an intelligent tutoring system that will help redefine the roles of teachers. It could also lessen the intimidation of the trial and error process in learning, that idea of failing. AI can give students the platform to experiment and learn in a relatively judgment-free environment (Moursund, 2006). When combined with big data and the Internet of Things more robust adaptive learning program can anticipate individuals' future learning behaviour, create learning paths, determine knowledge, and inform recommendation algorithms.

Signals

- IBM`s Watson has been developing Watson for education. The plan is to offer three elements of Watson to universities. The Watson Engagement Advisor a student engagement and experience enhancer. The Watson Discovery Advisor the advance search of thousands of unstructured data sources in seconds with a level of "intelligence" that can make sense of semantics, idiom, and grammar beyond the ordinary levels. The Watson Explorer dramatically reducing the time and effort spent searching for information (Eassom, 2015).

Predictive Learning Analytics

This is the statistical analysis of historical and current data derived from students and the learning process to create models that allow for predictions that improve the learning environment, content, and delivery methods (ECAR-ANALYTICS Working Group, 2015). Big data is one of the main predictive tools. It will assist in the designing of curriculum that collects data at every step of the learning process; it can address student needs with customized modules, assignments,

feedback in the curriculum that will promote richer learning.

Signals

- University of Hawaii STAR[7] charts students' academic plan and alerts them when students veer off their path. These alerts have encouraged students to stay on the path and have a sense of continuous feedback.
- Open Academic Analytics Initiative (OAAI)[8] Open source academic alert system that uses predictive modeling to increase student success.

Augmentation – on-demand learning

On-demand learning is the concept where an individual has the power to demand to learn content wherever they are based; on location, context, or time of day. Augmented learning is an on-demand learning technique where the learning environment adapts to the students' needs and inputs (Klopfer, 2008). With the aid of sensors, RFID tags, video, and other technologies students can gain a greater understanding of a topic while stimulating discovery and learning. Mobile devices along with low barriers to connectivity have allowed for learning to take place on the go, therefore, allowing learning to be linked to your location, your movement, and your surroundings. Location-based learning can be linked to mobile learning.

Signals

- Augmented reality allows us to put objects in the hands of students that would have previously been impossible. Aurasma[9] is an example of an open source application that allows an individual to create his or her own augmented reality instances.
- Wearable technology in education allows students to easily access information without any obstructions. Examples of wearable technology in the classroom are Autographer, Keyglove, Muse, VR, Smart Watches, GoPro, and Google Glass.

New learning environments

Classrooms, libraries, and labs used to be the only spaces where students spend their school hours. Fisher (2005) translates pedagogy into many learning spaces: the student home base, maker spaces, the collaboration incubator, storage space, specialized and focused labs, project

space and wet areas, outdoor learning space, display space, breakout space, the individual pod, group learning space, presentation space, and teacher meeting space. By 2020, the classroom will evolve into a creative space enriched by 3D printing, robotics, and real-time collaboration with community start-ups.

Signals

- Some universities such as Stanford University[3] opened 3D virtual universities on Second Life, a free 3D virtual world where users can socialize, connect, and create using free voice and text chat. By creating, an avatar hey can visit different spaces, interact, and learn as they would in real life.
- Collaboration with local museums and community organizations offer students real-world connections to the curriculum (Museums, 2013). Example YOUmedia an organization that partners with libraries across the United States to create digital learning spaces for youth[4].

Fewer exams, better students

More schools are trying to appeal to the 21st century student and one way in doing so is creating more competency-based education systems. A Competency-based system ("proficiency-based" or "performance-based") is one where students advance based on demonstrated mastery. Competencies are measurable, explicit, and transferable but overall they are empowering. Students receive support based on their individual learning needs (Marion, 2015).

Signals

- After a year of implementing competency-based education, Lindsay Unified School District in California improved its scores on the state's Academic Performance Index from 644 in 2009 to 691 in 2013 (Sheely, n.d.).
- Adams District 50 in Colorado was in the 28th percentile in reading nationally prior to adopting a competency-based curriculum. It then made the move to the 71st percentile crediting the help of the new competency-based system (Meyer, 2008).
- Competency-based degrees emerge as a popular alternative to traditional degrees awarded based on completing a certain number of credit hours. Competency-based degrees are self-paced, reward prior experience and measure learning through demonstrated proficiency (Deloitte, n.d.).

[1] Inexpensive Virtual reality read more about it at - https://www.google.com/get/cardboard/

[2] edx is an online learning destination and MOOC provider www.edx.org. General assembly is an educational institution for by an innovative global community that uses technology, business and design at fifteen campuses across four continents.

[3] http://secondlife.com/destination/600

[4] http://youmediachicago.org/

[5] https://www.schoology.com/

[6] https://www.theschoolinthecloud.org/

[7] https://www.star.hawaii.edu:10012/studentinterface/

[8] https://confluence.sakaiproject.org/pages/viewpage.action;jsessionid=ED8840660B789F36475F5FACCCC6D642?pageId=75671025

[9] https://www.aurasma.com/

[10] https://www.classdojo.com/en-gb/?redirect=true

[11] http://www.classcraft.com/index9/?utm_expid=68436248-22.lcEc6vnlSgK4u4QaP-64UA.1&utm_referrer=https%3A%2F%2Fwww.google.ca%2F

Alternative Futures

Scenario Development

Scenarios are one of the most well-known techniques for thinking about the future. Scenarios are qualitatively distinct visions, told as stories, of how the future looks. They do not try to predict the future but try to help the preparation for potential future challenges. Scenarios do this by raising questions - often provocative ones - Scenarios help raise questions about the future. This method creates plausible or viable views of the future, based on results of environmental scanning that decision-makers can use to determine their best response and how to react to alternative futures (Jackson, 2013). In what follows, I present three scenarios that aim to envision the learning system with ubiquitous computing, creating new outcomes for students, and how the system is restructuring from content to feedback. These scenarios were developed using a foresight method called Morphological Analysis. The scenarios are based on the six parameters for learning in higher education:

- Pedagogy/teaching styles
- Qualification distribution
- Learning mood
- Content validity control
- Where is learning taking place
- Assessment and feedback styles

Each scenario is divided into three sections to give context to the possible future.

1. Scenario description – describes the learning and higher education landscape, behaviours of students

and the organizations that are in charge of learning. This description is based on the parameters chosen randomly.

2. Persona – describes a possible student in this scenario.
3. Curriculum– a sample curriculum for a specific course taken by the persona in this possible future.

Morphological Analysis

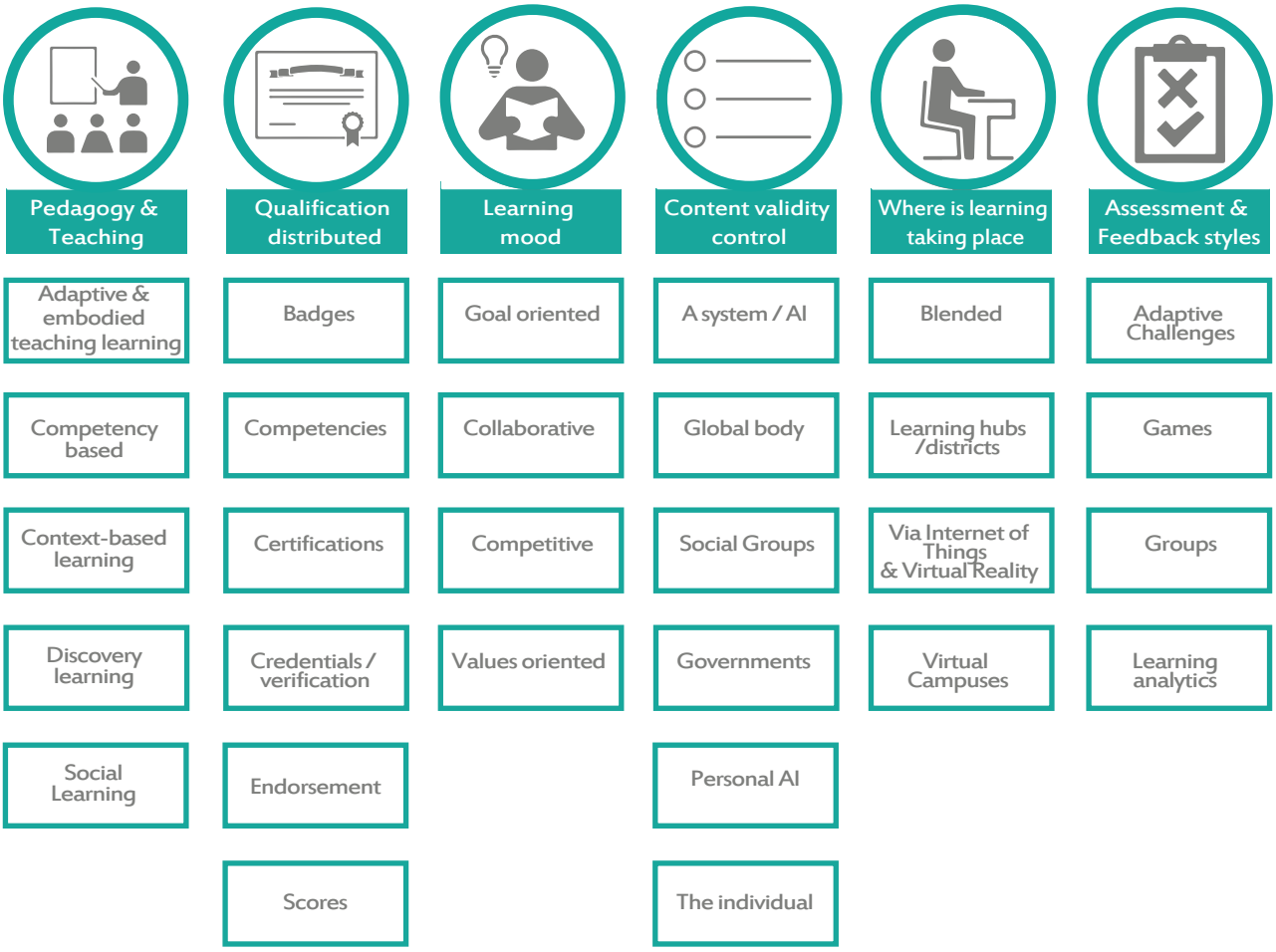
The morphological analysis process consists of the following:

- Specifying the challenge or problem: The implications of ubiquitous computing on the future of learning in higher education.
- Selection of parameters (areas of interest or focus)
- Possible solutions/ideas/elements under each parameter: found below each parameter
- Select different combinations of the ideas or elements (randomly)
- Select suitable combinations and create scenario

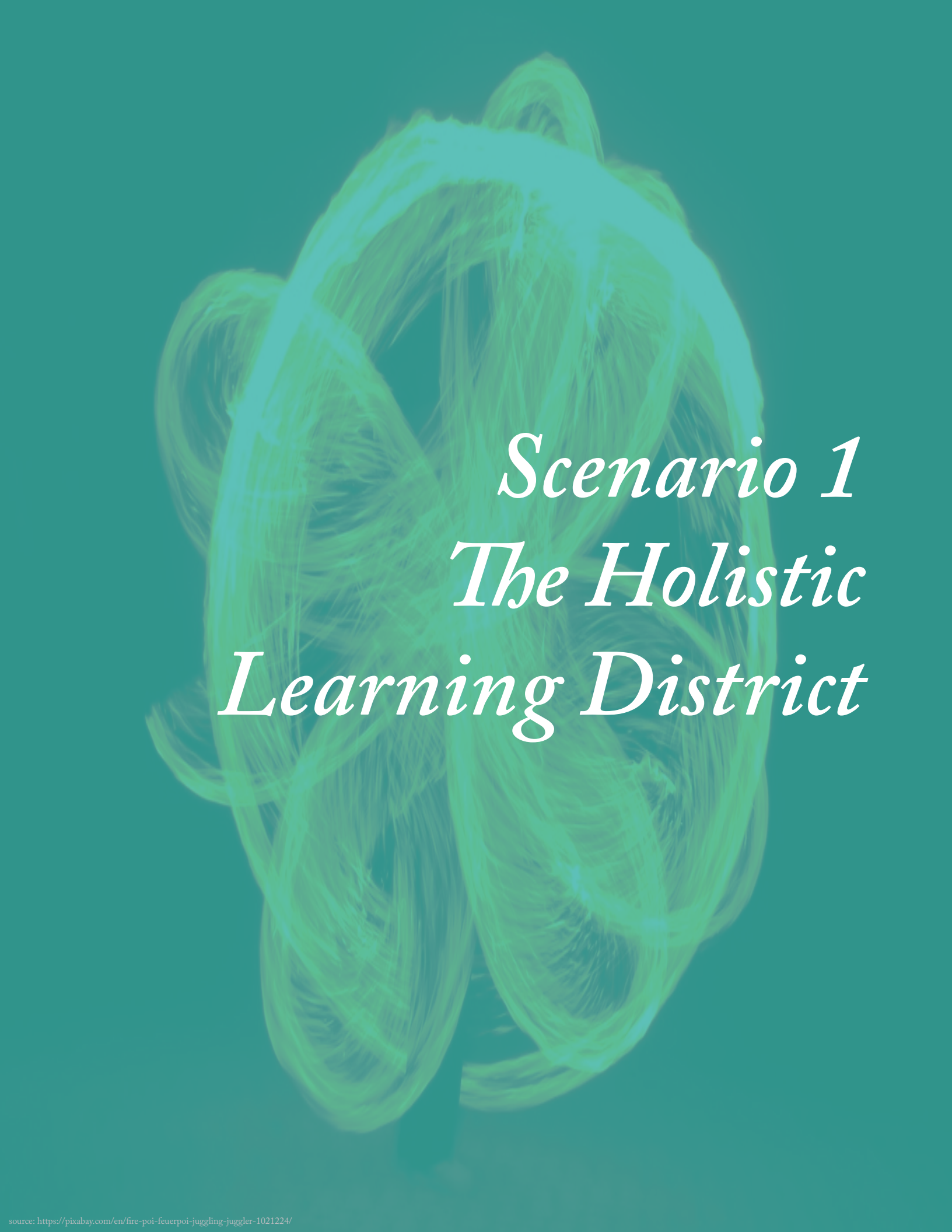
Parameters and variations

Below are the six parameters used to create the scenarios. Each scenario parameters were selected randomly to create unique stories. The random variables chosen to design each scenario will be shown at the beginning of each scenario.

Table 1 | Morphological Analysis Parameter Table



Beyond this wall lays the possibilities of the future. Open your minds and let us see what could be.



Scenario 1 The Holistic Learning District

source: https://pixabay.com/en/fire-poi-feuerpoi-juggling-juggler-1021224/

The Holistic Learning District

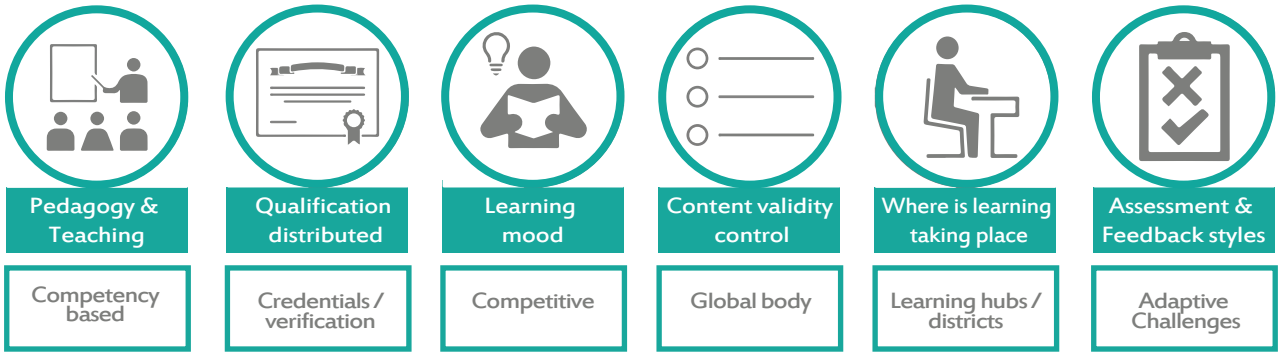


Table 2| the holistic learning district's variables

In 2035, the world has only 4000 super universities from a list of 23729 in 2015. The remaining universities rebranded themselves as floating Learning Districts. These learning districts were formed from multiple universities realizing that they could survive by joining forces. Most countries have between one and four learning districts. These districts also redefine the delivery of education as they allowed for districts in places where there was no existing higher education infrastructure. They offered similar elements such as sororities, clubs, sports and other activities to keep the spirit of university alive. The focus is on holistic learning where the learning district as a part of your life, your family and not just for two (2) years or four (4) but a lifetime.

Learning Districts are designed based on the multiple intelligence theory appealing to student's linguistic, logical, spatial, intrapersonal, kinesthetic, interpersonal, naturalistic, and rhythmic natures. The districts are designed to show that learning could reside outside of the individual such as in non-human appliances12, etc. Every District is designed to capture data specific to each student, how they learn new behaviours, how they respond to motivation, etc. The best encryption programs were built into the districts' control systems and applications to ensure the safety and the security of the information being collected. At every corner, there are means for constructive feedback. At every corner, there are means for constructive feedback. Learning Districts house natural and augmented recreational centers, innovation hubs for small businesses, alpha maker labs, health stations, and rejuvenating springs. They offer service centers such as social services center, drone ports friendly fabric-care bot, and group oriented

restaurants. Spaces are available for body mind and soul as they offer community movement spaces, music appreciation centres, artistic expression rooms, brain power enhancing rooms, debatable centres (areas that provoke questions based on current events through images, text, and sound), nature observatories, multi-sensorial museums, group and individual calming zones. These are just the basic elements of all Learning District. Some Learning Districts adds additional features based on the desire to preserve cultures and other elements. Teachers are respected and are still the head of courses playing the role coaches or mentors for students.

Tuitions were revised at the start of the Learning District movement and officially moved to a standard annual membership fee in 2025. Based on your membership level you will have different privileges to different communities/groups within the district. There is the lifelong membership which a whopping 82% have signed up for, the annual membership and the month by month membership. For those who want to benefit without being a member, there is the option of signing up for single course adventures that can last anywhere from a day to 2 months. Each successful adventure will allow for small privileges within the districts. These learning districts strayed from the standard entry age. Many parents have signed up for children as young as five to these Learning Districts.

These districts offered a global credential system that allows everyone in the world to be on the same learning system. Unique encryption code allows for the global distribution and regulation of credentials. They developed credentials based on the crossover learning method. The crossover learning method bridged the formal and informal learning arrangements and quantified these acts into learning credentials. The labels such as 'kindergarten', 'high school', 'higher education', 'professional development', or 'Carnegie unit13' became less useful as life-long learning became the root of the Learning Districts and students only moved to the next learning level if they've proven they've mastered the concepts. Students could also revisit levels for revision and pure fun if they so desire. Formal aspects of learning interlaced with the informal learning experiences that occur during museum visits, maker labs, and conversation with friends, hobby clubs, or internships thus creating a level learning ground not defined by age or grade level. All areas and elements in the learning districts are equipped with connected technologies, the latest approaches to assessing and recognizing learning.

Table 3| The Holistic Learning District Timeline of Events

2018	• European Universities start adopting Finland's[14] model
2020	• Europe successful transforms 80% of their universities into super universities • Augmented reality the flagship for super universities success
2023	• South America follows • Talks of a global credential system starting amongst ministries of education departments in the US, UK, Europe, China, Australia and Canada
2025	• Global credential system passed • Tuitions abandoned, membership fees created • 3000 universities close in one month
2028	• Super universities rebranded as Learning Districts. All countries accept this new model (some reluctantly) • Age limit eliminated from Learning Districts clause
2035	• Only 4000 universities remain

Persona: Meet Joel

Figure 8| Meet Joel (source: https://pixabay.com/en/people-black-homeless-black-people-913778/)

Age:	35
Career:	Financial Conductor
Likes:	Basketball
Learning style:	Multisensorial

Learning History

Joel attended a traditional university. He completed a 4-year bachelor's degree in Finance and worked for a firm for 2 years. He enjoyed his time in university as they were incorporating more blended learning methods. However, he felt that he did not learn enough to keep him up-to-date in his profession. He missed elements of his universities days but knew it was not possible as he was no longer enrolled in university and he did not wish to spend the money to get a master's degree. He started using MOOCs to keep himself up-to-date but found them impersonal, he really loved the atmosphere of learning at a university. When talks of the new Learning Districts and a global credentialing system emerged, Joel was extremely intrigued. He was longing for a lifelong membership at a university that would give him all he wanted without the debt. He could not wait for this system to be passed in his country so he enrolled in a European learning district and has been enjoying it ever since.

The following is a course in blockchain that he wishes to share.

Curriculum 1
Frame, Find, Play, Plan, Make, Try

Course: Blockchain Technology IV

Description

This series of courses provides essential to complex elements of the shared ledger technology Block Chain. Curious minds that dive into this course will be challenged to break down the cryptography keys of blockchain and build a unique chain. We will observe the inner workings of the blockchain and tailor blocks. Visual cues will enable us to dive into the time stamped development, cryptography and logical working of the blockchain allowing you to create your own version. You simply need to choose your path and go learn. No prior knowledge of blockchain is necessary to enjoy and complete this course. Some interest in financial models and cryptography is recommended. We will evaluate this based on your personal learning path and potential learning path. Curiosity can lead you to many places let blockchain be one.

Locations

Our learning districts in all major cities are available for this course. Our learning districts are open daily to our students, contributors, experts and consultants around the world. If our districts are too far, we offer the same experience on our multi-sensorial learning platform that is available on all devices and platforms. We offer an upgrade to our AI system as you will come to love the efficiency we strive to maintain. We are compatible with the four major AI platforms. If you are a designer we also support off the grid systems, as we believe everyone should be able to enjoy our facilities and services no matter what their views are on the information protection act.

This course has a wide assortment of "visceral," hands-on, learning resources – well-stocked library, museum, lab, workshop, technology, art, construction spaces, multipurpose music-dance-theater recreation spaces, and outdoor garden-farm-biology-ecology spaces. We believe that inspiration for any course can be

found anywhere. You will have unlimited access to both our virtual and real labs during the course. We have global access points and professors that give you that human touch when you need it the most.

How to take this course

This course will take you through both the physical and the virtual world within the virtual world you will create an avatar that will represent you during the virtual elements of the course. This course is divided into 5 stages:

1. FRAME – define, identify and inquire
2. FIND – research, gather, listen, observe
3. PLAY AND PLAN – ideate, form, analyze, design, act
4. MAKE – prototype, draft, choose, create, apply
5. TRY – test, relearn, correct

Our system is not intrusive and allows you to set your learning intensity and involvement levels. Sections of the course can be taken numerous times until the desired mastery is achieved. Students can stop at any point in the course leaving with some level of competence.

What do you choose?

- If your aim is simply acquiring knowledge or a refresher with limited AI assistance, we recommend the WADING option, which covers stages 1 or 1 and 2.
- If you wish to take control of your digital currency wallet, we recommend the SWIMMING option, which covers stages 1 - 3.
- If you wish to be a short-term digital currency advisor, we recommend SNORKELING option, which covers stages 1 – 4.
- If you wish to have a career in digital currency, cryptography, finance we recommend the SCUBA DIVING option, which covers stages 1 -5 and sometimes with a revisit to stage 3.
- If you have prior knowledge of the topic or will be using advanced deep learning or advance AI assistance you can choose or JUMP option, where you start at any of the stages you see fit.

FRAME

Here you figure out what you know and what you need to know. Live/holographic instructional classes, presentations, demonstrations and field trips (virtual, augmented or real) nestled with discussions and debates led by students, experts, and teachers. We have multiple teachers with various expertise joining this course. Each teaching the respective section of the course in which they are scholars.

- What is block chain? Why block chain?
- Case: Brief history of blockchain and digital currencies
    - *Financial services collapse and rise*
- Elements that were derived from block chain

However, the main part of framing is the framing you make for yourself

- What are the problems do you want to solve and how can blockchain help?
- What opportunities you want to take advantage of?
- What do you want to make happen with blockchain?

Global learning status:

If you choose to end here your learning status will be set to **KNOWLEDGEABLE** in blockchain.

Frequently completed in 2 to 3.5 weeks by other students who have taken this course. 97% completion rate

FIND

A student can choose to work in teams with other students or AIs, by themselves or in a team with their own AI. Here you will be sent on challenges to complete levels of FIND IT. Hear what people know or think. This stage of the course can be staggered throughout the whole course, or it can be done all in one afternoon, it is up to you. Each level has surprises that can add to your social, virtual, or learning goals and that can be used within this course as expert aid, advances, and answers and as keys to unlock new information for related courses.

- Observe the use of blockchain today
- What is different?
- Who are the players?
- What are the technologies behind it?
- Can you find the flaws?

Global learning status:

If you choose to end here you will be seen as **SOMEWHAT COMPETENT** in blockchain. This will be added to your job and social profile. This is visible to our network of organizations and learning community.

300 unlock codes found within 5 days.

Most students return to this section every 3 days during the duration of their course.

PLAY & PLAN

You will be given different roles or tasks to complete based on the specific areas of blockchain you are interested in. You will form virtual organizations to design, analyze, and act on new procedures of the blockchain logic. All elements of role-playing are performed using your avatar. You have a period of 1 week to 2 months to complete this section. Many have skipped to this section of the course if they have prior knowledge of block chain, or they installed the financial accuracy updates to their AI. You have the option to be a team player with other avatars or your AI.

Note that choosing avatars goes a long way for you as your social scores increase and your benefits adds up.

- Case: Alternative cryptocurrencies
    - *Government sponsored money*
- Core public registries
- Blockchain layers and Internet stack
- Cyber security initial level

Global learning status:

If you choose to end here you will be seen as **COMPETENT** in blockchain and can be hired as a mid-level digital currency advisor. This will be added to your job and social profile. This is visible to our network of organizations and learning community.

45 students who completed this level has been hired as digital currency advisors within 1 month of completing this section

MAKE

Here you can add your own rules, theories and layer to the blockchain. This is a fully project based section where you will be updated on the elements that you may have missed while those you already know will be reinforced using numerous techniques. Each individual will be assigned an expert that will help wherever needed. A student can also choose to only interact with AI experts.

- Prototyping new strands of the blockchain
- Verification and trust protocols
- Cryptography advanced
- Cyber securities manic level

Global learning status:

If you choose to end here you will be seen as **VERY COMPETENT** in blockchain. This will be added to your job and social profile. This is visible to our network of organizations and learning community. Your name and skills will be featured on our front page for a week. You will earn a badge in Crypto and cyber securities as well earn virtual credits towards other courses in our catalog.

55% of students made it to this point

TRY

Here you test your theory with other students who have completed the course. Your code and layers will be made public for others to test, use and bid on. This could turn out to be a lucrative process for you if bids are made.

(The school is entailed to 5% of any bids that was made through our platform)

- Reconfiguring code
- Testing
- Correcting issues

Global learning status:

You have completed the course and will be considered as **EXTREMELY COMPETENT** in blockchain and will be placed on our course advisor or expert lists. Depending on rank, you may be paid to mentor future students in this course. You will be promoted to our job and social pages for 1 month and will be given first preference for jobs within this area. You will gain virtual credits for 4 courses on our campus and towards other services offered on our campus.

If your try a stage and was unsuccessful be aware that a stage can be taken many times and additional assistance will be made available to you based on your responses during the stages. Remember learning is a cycle and life-long process it does not stop here.

Other Instructions

Blockchain IV

Other Recommendations

- Course streams usually taken together: **Cyber securities + Economics of the past and present + Digital currency + AI financial support management.**
- Some Courses students took immediately after this course : **Computational creativity, and Cyber security hacks**

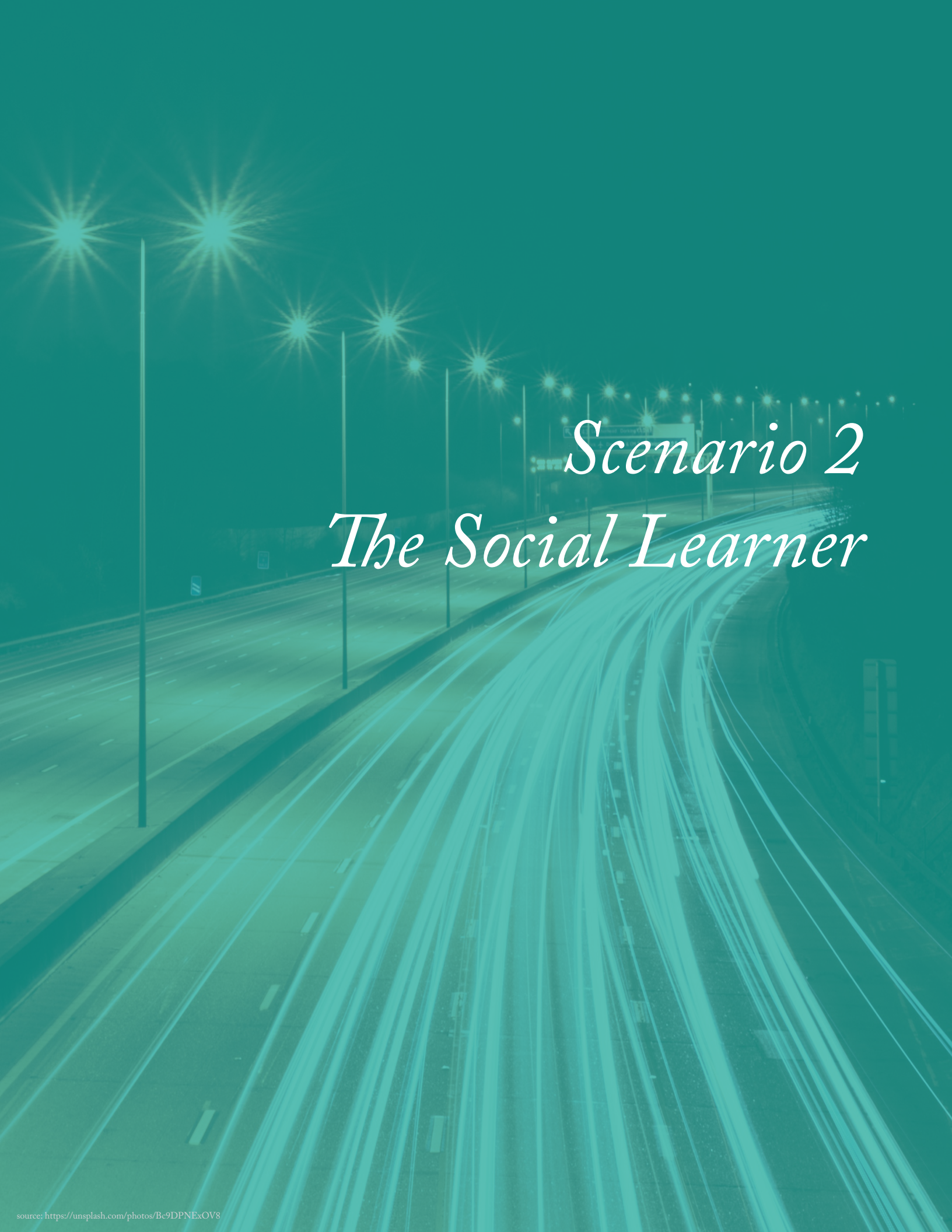
Course ratings

Ratings are all done on a scale of 1 – 5. (5 being the highest or best.)

- Overall ratings for course: **4**
- These ratings scores the relevance of such a course for the current job market: **5**
- Job market in 5 years: **4**
- Job market in 10 years and above: **2**
- Ratings show course recommendations by individuals: **3**
- Ratings show course recommendation by AIs: **4.5**

Disclaimers

- We guarantee that our AI will create a series of steps that is most suitable for you to reach your goal. However, we do allow for an override of our AI if you already have compatible AI systems.
- Course content is updated daily based on fundamental announcements in the media, politics, weather or social.
- All competency ratings are based on scores obtained wfrom each section.
- Our amazing privacy features allow students to adjust their privacy needs.



Scenario 2
The Social Learner

source: https://unsplash.com/photos/Bc9DPNExOV8

The Social Learner

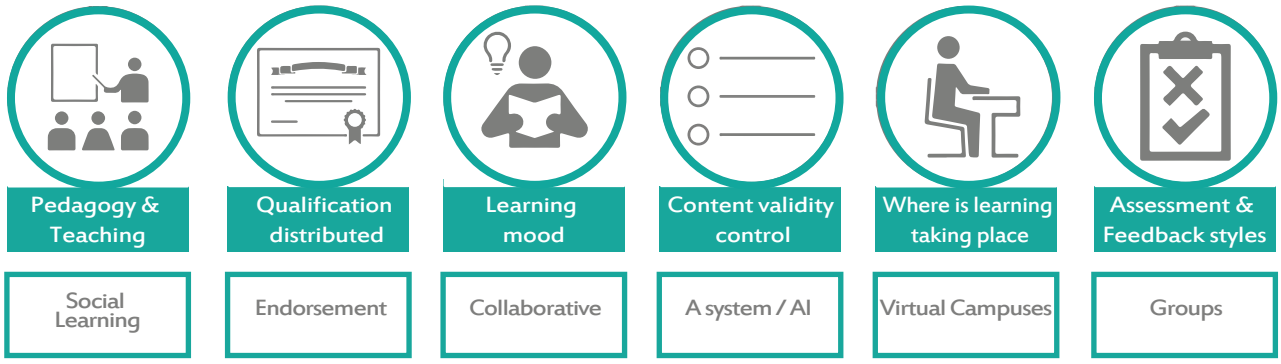


Table 4| the social learner's variables

In 2035, the top five Social Learning Initiatives (SLI) are fully functional and rivaling the remaining universities, which had globally dwindled down to a measly 200. This concept, Social Learning Initiative, was conceived by a group of 15 university graduates, from design, artificial intelligence, pervasive computing, philosophy, and education discipline. These graduate's idea was to use the powerful pull of social media to reinvent higher education and push it forward into a lifelong learning system. They brought their ideas to the social media giants of their day. These social media giants were already looking deeper into education separately but based on the ideas of this group, they finally decided to join together on this education initiative. They harnessed their power of connecting people, gathering and manipulating data and created unique formulas for successful learning that led to usable skills, increased employment, and interoperability.

Social Learning Initiative uses deep learning machines, personal preferences and reactions[15], organizational trends, knowledge experts, group dynamics, moment marketing and social media interest gathered from around the world daily to create Learning Journeys. Learning Journeys are the main learning tool of the Social Learning Initiative. Learning Journeys draws its inspiration from the Hero's Journey[16], used in literature to create gripping stories. These Journeys take students through chaos, network, complexity, self-organization, multidisciplinary concepts to make their way through while learning in a mix of real world story-telling format. Differing from literature the Learning Journey is one that is not done alone, Social Learning Initiative mandate is to ensure that you are not taking this journey by yourself. Before an individual starts a Learning Journey they join Learning Groups. These Learning Groups are formed based on interests, ideas, topics, similar

learning outcomes or just groups of friends or family wishing to learn together. Groups can be initiated by individuals themselves or recommended by the Social Learning Initiative based on the previous data collected through social media.

An individual's learning progress is closely tied to that of their Learning Group. Learning Groups along with the SLI, and Experts are all part of building the Learning Journeys. Learning collaborations are done through the various social media points, the virtual worlds, games, Internet of Things devices and communities meet ups. Social Learning Initiative bought properties from closed universities to use as spaces for learning groups to meet, create, build, and discuss. However, the virtual space remained their true medium.

Learning Groups act as a support team for students and plays a great role in achieving lifelong learning goals. Members of the learning group hold different roles:

- **Journey creators** – paid to curate, shape and verify learning journey with the help of the SLIs AI. They are usually highly skilled and knowledgeable in the main focus area of the group. Normally former professors, coaches or teachers.
- **Passion checkers** - are your resident motivators. They push the team to try their hardest and meet their desired goals.
- **Excavators** - are always looking for new and exciting topics outside of the given results from the AI that can utilize the group's potential and peak interest. They work closely with Journey creators.
- **Forevers** - are students that are there for the long-haul. Their interest fluctuates at times but they will forever stay within the same learning groups. Their goal is learning.
- **Floaters** - are members that jump in and out and explore different learning groups. They can also be nonmembers that sign up for single course adventures.

Students can be a part of as many groups as they wish. Each group has their own membership fees that are regulated by the Social Learning Initiative. In addition to membership fees, there are admissions fees to enter a learning journey. There are in journey purchases that could greatly assist groups on different challenges.

In 2028, Social Learning Initiative introduced Endorsements. Endorsements are unbiased assessments of an individual's Learning Journey performance. They can be converted and used as

different forms of credentials for students when looking for jobs. Each Journey's endorsement guide is unique. Endorsements are based on each individual's level of performance in a course, learning challenges, and everyday learning. With all their success, Social Learning Initiative has made learning the social event of the times.

Table 5| The Social Learner Timeline of Events

2020	• 3500 universities worldwide close due to a reduction in student population • DIY and MOOCs learning programs taking over • Skills shortage crisis reaches an all-time high. Employers plead for a new way
2023	• Social media companies meet and create the Social Learning Initiative (SLI) • Introduction of the Social Learning Initiative AI call Le • The first groups of students start their first learning journey using Social Learning Initiative
2025	• SLI allows more neutral and affordable payment for learning journeys Majority of African, Asian and South American Countries have groups using the SLI • Major universities that remain partner with social media companies on Social Learning Initiative • Organizations brought on to create journeys surrounding their major issues
2028	• Additional educational tax on learning journeys cause strong backlash from learning groups • Social Learning Initiative wins all legal battles over the taxing of learning journeys • Prices for learning journeys increase. Little protest by users
2035	• Upgraded Social Learning Initiative AI installed

Persona: Meet Kate

Figure 9| Meet Kate (source: https://pixabay.com/en/african-american-man-eye-997244/)

Age: 55
Career: Plant Generator & Urban farmer
Likes: Globe Trotter
Learning style: Visual

Learning History

Kate needed a learning platform that she was not judged on her age or abilities. She has tried many online courses but has lost interest and focus easily. She only finished 5 of the 200 courses she has signed up for. She remembered the day of universities and she loved the camaraderie but hated the static classes and wanted to experience a space that learning was a part of her life, fun and seamless. She decided on a career change 5 years ago when the company she has been working for 20 years closed. Her husband jokingly said she should be a professional gardener. This led Kate to talk to her granddaughter who has been raving about this new program SLI.

Kate's daughter is currently a member of the social learning group called Plant Whispers, Sustainable Urban Gardeners, and Humane Technology. The groups range from 500 to 13000 members of varying age groups worldwide. She gets overly passionate about her journeys and brings this passion to every challenge. She is currently on a journey where her team has created 3 plants that are being developed. She has decided to stay on the journey to see it to completion as she wants to use these plants on her farms once their molecular structures are strengthened. She loves how intuitive the system is and how the journeys integrate with her job. She is a great supporter of the endorsement system.

She has decided to share the rules and instructions of her current learning journey. The information below is gathered from the initial overview Kate reviewed before signing up for the course. It includes few guidelines and a brief overview of the first legs of her journey. Note that the information would be found in a different format in her learning journey layout but was placed in this format for distribution purposes. This curriculum design is Based on the hero's journey framework: Ordinary world, The call to adventure, Refusal of the call, Meeting with the mentor, Crossing the threshold, Tests, allies and enemies, Approach, The ordeal, The reward, The road back, The resurrection, Return with the elixir.

Curriculum 2 The Learning Journey

Plant Molecular Technique Journey

Hi, I am Jot the AI for this learning journey. I will be here for all your group needs. This journey allows groups to dive into the major techniques involved in plant molecular biology. This is a long-term laboratory/real world journey for teams that want to perfect their techniques in purification, cloning sequencing, PCR[17] amplification of plant nucleic acids, electrophoresis, and laser microdissection among many other techniques. Students will interact with me, their group members, and other groups.

Opportunities to design new and sustainable crops, climate adaptable planting techniques are just some of the amazing things awaiting you. Challenges are disbursed throughout the journey and will possess clues for plant generation, techniques and give your group advantages that could make the journey smoother. I am proud to announce that two of the world's leading Bioengineering companies have been brought on as design architects for this journey. They have selected Journey creators from 25 groups to assist them with the building of this space. You will be working on issues pertinent to their on-going operations. Teams with the best designs and the healthiest crop will be given the opportunity for greater partnerships with these organizations beyond this learning. No prior knowledge is needed but lets' face it having people on your team that is interested in this adventure will go a long way. In the meantime, here are some guidelines in activating your teams.

Guidelines, Roles and Endorsement breakdown follow

The Call to Adventure

(Transcript of what the learning journey AI said)

Journey Guide

- A minimum of three members is needed at all times to ensure the journey does not end in the disruption of your biosphere. The length of your journey is dependent on your group's performance. It's worth every second.
- As with all other learning journeys you and your team will decide on individual roles, tasks, planning sessions, meeting times.
- This journey is mostly virtual with and physical learning sessions for plant outputs. Participating labs, hubs, and maker spaces are available. Your devices will notify you when you are close to anyone of our participating facilities.
- Most teams that advance past their Ordeals goes on to develop their biosphere, techniques, plants, software, implementation strategies for sale, research or provide content for new versions of the journeys.

Roles

The course starts when groups decide which members will be participating. Members of a group can participate in the course in the following ways.

- Active roles are each individual will receive endorsements upon completion. An active participant aims to make it to the end of the journey.
- Support joins the team for selected task, debriefings, and challenges. Support uses the challenges to sharpen their knowledge gain endorsements for sections they are missing or simply because they find it fun. They may also be called on by other team members for assistance.
- Observers watch the adventure live or recaps of the adventure without participating in the challenges. No endorsements

available.

Endorsement ratings

Let's face it endorsement is a serious matter so here is the criteria for endorsing fellow members of the group fairly. Each person should ensure that they endorse no less than 3 and no more than 10 members of your team. The system will determine which group members you will endorse based on the level of interaction and communication within the journey. Endorsement links are found at the end of each leg of the journey.

Overall types of endorsement options --- Fully Endorsed, Endorsed, Endorsed with reservation, Revision.

Each individual is given an overall ranking based on the following endorsement guides:

- Jot (Social Learning Initiative AI for this program) - based on analysing text, speed, moves, and points
- Organization – endorse based on completion of tasks, attitude, and involvement
- Group members – members endorsed based on five different areas: Willingness to help, Completing tasks/challenges, Dedication to team goals, Communication, Creativity.

The Journey Continues

As a group, you can now decide on how useful this course will be to you and your team. Ask yourselves will this enrich your daily life, will it make you a better person, better at your job, find a job or tasks you love, improve group dynamics, and earn you valuable endorsements. If you think so well let's go if not then there are other journeys that await you. Bon voyage!

Refusal

Ok, so you are still here! Let us do this. This journey will adapt based on your group's progress, climate change, new discoveries, disease outbreak and other elements.

- Teams explores the tools, facilities, and environment.
- Advance teams and new teams interact. Advance teams knowledge may be of great help to your team down the road so do not hesitate on making great connections.

Meeting the Mentor Groups, AI, Partners

Here we fully leave the ordinary world and cross the threshold into the new space. This gamified space will add basic knowledge on plant molecular techniques to those without and assess the knowledge of those with experience this challenge will decide which roads you explore first and with which members of the group. Remember working together is key. Elements are found both in virtual and real spaces.

Crossing the First Threshold

Your first tests arrive which you will tackle as groups. They are interesting challenges to give the group a taste of what is to come. They also meet other groups, support, and opposing teams. Tests will come in various forms testing knowledge and strengths.

Endorsement opportunity

Tests, Allies, Enemies

Design new and sustainable crops, climate adaptable planting techniques and other unique planting methods.

Your group will endure setbacks as you design. Some setbacks are built in, based on real world events and left by other groups who have journeyed before you. Your group must devise new approaches and adopt new ideas to tackle any of the setbacks that may occur.

Endorsement opportunity

Approach

Numerous obstacles ahead. How does the group fair using the approaches and ideas they have developed in the previous sections. Some groups may see themselves returning to some previous level to find clues to get past the ordeals; some may progress and others may decide to end the journey and leave with their accumulated endorsements. Each team faces these ordeals different points in time.

Endorsement opportunity

Ordeal

The reward may come in many forms: an object of great importance or power, a secret, greater knowledge or insight, contract offers with collaborating bioengineering companies, Social Learning Initiative journey creator contracts, job offers and bonuses.

Whatever the reward, groups should be aware that the journey is not over, other hurdles may be waiting.

Reward

Application of knowledge gained on the journey should be applicable to the real world, therefore, teams have to identify areas where they can implement their knowledge to better the world, their group, or themselves.

The Road Back

The climax of the journey, final tests, talking with bioengineering companies.

Endorsement opportunity

Resurrection

Results or real world application, reflections, self-realization will be recorded by Jot (The AI) and the group.

Final Endorsement opportunity

Return with Elixir

Scenario 3
To Track or Not To Track

source: https://www.flickr.com/photos/spacex/16661753958

To Track or Not To Track

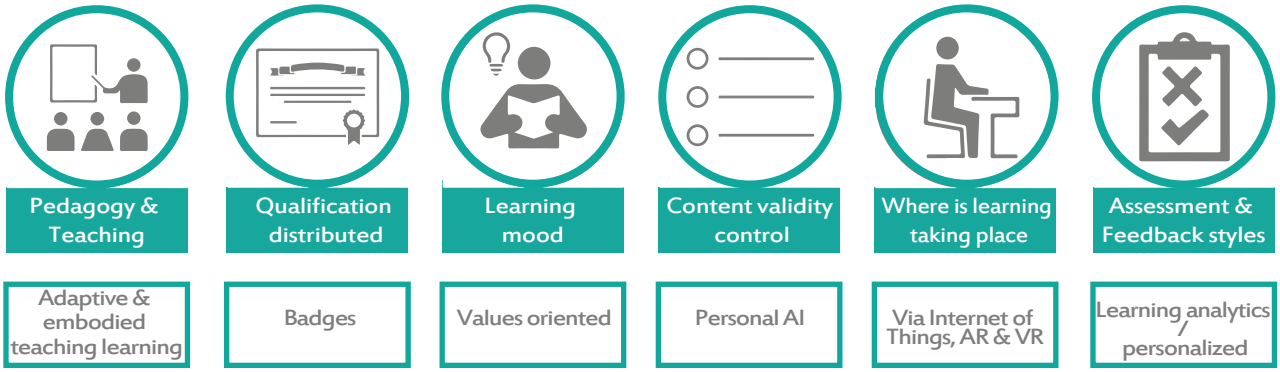


Table 6| to track or not to track's variables

In 2035, the fourth version of the common Lifelong Learning Profile (LLP) tracker has been released. It continued the debates on whether or not education has been reduced to a shallow system of quantifying every learning moment into a credit system, sacrificing deeper meaning for employability and status. Or whether learning was truly personalized as individuals could not control their own algorithms. The Lifelong Learning Profile quantifies everything you see or do and records your equivalent learning scores. The Lifelong Learning Profile is the backbone of the Learning Credit System designed by the world's leading Learning Analytics Companies (LAC). Learning Analytics Companies strategically targeted universities offering intuitive learning experiences with less time, effort or money. They partnered with the Internet of Things companies such as Cisco, Qualcomm, and others to be able to gather data from students at every possible access point.

In recent years, new and old members were asked to sign up for the learning credit score system[18]. This system outran the degree certification system in 2028. It converts everyone's aptitude, character, willingness to learn, how they learn, how much they learn, how they pass on knowledge and how they use knowledge to badges with specified ratings. They are able to capture facial expressions, eye movements, body language, emotional cues, text analysis, voice stress, EEG and electrodermal activity, due to their partnerships with Internet of things platform companies and therefore used this information in the measurement of learning. Individuals can earn badges at every corner. These badges and scores are made public. An individual's learning credit score could be traded in for different items within the system such as learning boosters, free membership passes, and extra boost with HR AI's amongst other perks. Tracking of every move is now the norm and using your learning abilities

for or against you is the prerogative of education technology companies. Educational technology companies now outrun the higher education system because of their sheer size, business acumen, marketing strategies, the volume of users and their wiliness to spend an exorbitant amount of money to ensure that students learn through them instead of universities. Many cannot compete but competitors are ready to strike from every angle.

Currently, 20 countries have started using learning credit scores more widely. Companies and governments use these learning scores when choosing employees, setting tax brackets amongst other areas. This has resulted in a backlash as individuals have stated that they feel intense pressure, judgment and invasion pf privacy by this system. The public display of scores has increased the competitive nature of individuals, caused increased arguments and segregation based on learning scores. This behaviour is one that is not uncommon but definitely a behaviour that was expected when the concept first started.

A company that has started competing against these Learning Analytical Companies are the Centaur Algorithmic Angel[19] Tutoring (CAAT). This company started in protest to the learning credit scores and the constant monitoring of badges. This company started with their aim to fully personalize learning and get back the passion for learning. They understood that we can't actually personally control personalization. We can't control our algorithmic selves. So they decided to use algorithmic angel principles to do so. Centaur Algorithmic Angel Tutoring acts as a personal assistant, personal tutor, learning credit auditor, bad-data bouncer[20], proxy avatar and an image protector. They offer students easier ways of turning off their learning analytics and other privacy protection options. They offer nostalgic tutoring through personal centaur[21] coaches. Your intelligent digital guardian protects you from algorithmic manipulation that restricts your personal freedom. They expose you to alternative choices and diverse worldviews. They shield you from intrusive surveillance and give you control over your personal learning data and improve your online security. Additionally, CAAT could ensure that different environments and devices stay in your control. These coaches offered both in person and virtual tutoring sessions. They acted as educational physiologist allowing individuals to explore their learning with a confidant while being a coach to push themselves to their best. Learning analytics companies and CAAT companies are battling out for the learning landscape. This battle has only just begun.

Table 7| To Track or Not To Track Timeline of Events

2018
- Major Education Technology (EdTech) companies rebranded themselves as Learning Analytics Company (LAC)
- Five of the largest Learning Analytics Companies launched their first lifelong learning profile tracker. Originally a wearable device that captured learning styles and optimized every experience into a learning experience

2020
- Universities see a remarkable decline in the student population
- LAC improved their Lifelong Learning Profile and incorporated more Internet of Things devices to help track learning

2023
- LAC out rightly using all devices to gather data to help students learn better and compete with the growing competencies of AIs
- LAC introduced the Learning Credit System to the world

2026
- Four countries start to incorporate the Learning Credit System
- Two more countries come adopt the Learning Credit
- Small groups protest the privacy of the system

2028
- Algorithmic Learning Angel developed by a group protesting the Learning Credit System. First version released
- Learning analytics companies block users with algorithmic angels from using their learning analytics reducing learning credit scores completely resulting in job loss

2035
- Algorithmic Learning Angels rebrand and call themselves Centaur Algorithmic Angel Tutoring (CAAT) and adds centaur tutoring
- Fierce competition between LAC and CAAT

Persona: Meet Cali

Figure 10| Meet Cali (source: https://pixabay.com/en/girl-woman-snow-blizzard-people-926020/)

Age: 22
Career: Extreme Freelancer[22]
Likes: Globe Trottering
Learning style: Multisensorial

Learning History

Growing up with the constant nudge to learn and be competitive, Cali quickly conformed to the learning analytics system. She had some of the highest learning scores in her town and benefited strongly from how in tune she was with the system. Racking up learning points wherever should get it, Cali lost the burning passion for her learning her parents told her about. Her scores gave her access to numerous perks, job/task offers, travel opportunities, software enhancements, etc. She does several freelancing tasks that earn her more than enough to compensate where the perks don't.

Cali was introduced to the Centaur Algorithmic Angel Tutoring (CAAT) program by her parents who wanted her to appreciate learning for more than just the points. She has started to explore courses through the CAAT filter and has started to explore learning without the burden of constant badges and scores. With Learning Analytics Companies, student's number and type of badges were the main focus with CAAT met goals and outcomes along with badges are the focus. Even though she is now using the CAAT program her country is still under the learning credit score system to classify individuals, offer jobs and set pay, therefore, her learning data will be collected but she now gets to decide if she will add her scores to her learning credit total, a feature that was not available with the Learning Analytics Companies.

She wishes to share with you a course she has been completing using the Centaur Algorithmic Angel Tutoring program.

Curriculum 3 Purpose, Play, Passion

Cultural Intelligence in Leadership Cycle 1

Purpose

After talking with you about your desired path, observing your behaviour, responses to individuals and tasks, and observing your learning credit scores, I realized that your leadership skills are down because of lack of chances to exercise them, poor cultural awareness, decreased self-confidence and your anxiety with your learning credit score. Since you eventually want to lead a team of freelancers to obtain larger tasks I suggest this course as you may have a high aptitude for it. Here is a briefing on the course.

Cultural Intelligence (CQ) is the natural evolution from the well-established notions of IQ (intelligence quotient) and EQ (emotional intelligence). Good leaders need all three to lead effectively. Good leadership is even more important in an Artificially Intelligent run organization and world as knowing when to take charge is critical. Leaders need to be efficient, empathic, decisive, aware and able to lead diverse groups. Cultural Intelligence is the ability to cross divides and to thrive. Developing this skill will only benefit you. You will be placed in simulated situations to provide you with enough practice. Cultural Intelligence in Leadership has 3 cycles.

To guide you to your purpose

What do you think about this course? Do you think it is beneficial to you? Does it tie into your life's purpose? If yes, you can choose one or more of the following session outlays:

- **Virtual classroom:** – All activities are done on CAAT virtual campuses, with monitored real life simulations.
- **Personal centaur tutor:** –Virtual and in person meeting with your tutor. Working both in the virtual and real world space.
- **Group meet up:** – In person sessions with a centaur tutor in spaces decided on by the group members. Virtual class sessions outside of meetups.

Please note that a personal centaur tutor comes at an addition price.

Each course has their specific goal and outcomes but to ensure that it remains in line with your purpose in life you should set your own goals and outcomes to ensure that the course is tailored to you. Goals are broad, general and generally not measurable whereas intended outcomes are specific, precise, observable and measurable.

Sets your mains goals

- Set 5 – 10 goals for this course that the centaur/AI will ensure you meet. Goals can be changed after they are set for a reason.

Set intended outcome

- Set 5 – 10 intended outcomes for themselves throughout this course.

Consideration

- Cultural Intelligence is made up of 3 cycles. Each cycle ends when the learner has reached the outcome and goals set in the cycle and by themselves. New outcomes and goals can be added for other cycles. A student can stop at any time and receive their badges and scores for the course.
- Your actions and reactions related to the elements of this course will be monitored for the length of this course. Learning scores will be accumulated. However, you have the choice whether or not these scores should be added to your overall learning credit score.
- Badges are award different intervals based on accomplishments and acquisition of new skills. Badges will be quantified and added to your score.

[Play]

Step into a virtual video game replica of your environment. Here you can bring the virtual world to bring out your passion take the following steps:

a. Plan the base of your story – this is a guided tour filled with major elements of Cultural Intelligence in leadership elements that help you create your unique leadership story.

Elements to help build your story

1. What is cultural intelligence
2. The modern leader
3. Moments of cultural intelligence
4. Design the picture that depicts you (this picture will evolve throughout this cycle and beyond)
5. What influences decision making, for you, for others, for …

b. Build your surrounding – design elements of the environment in which you will practice your skills. This will help you not just to hone your skills but to also understand the environment, situations, and nuisances of the world that needs these skills. By being engrained in the fiber of the course passions will come out.

Create scenarios, quizzes, puzzles and challenges around

1. Leadership opportunities
2. Conflict resolution
3. Cultural awareness campaigns
4. Cultural landscape
5. Learning to flex
6. Other inspired moments from the cycle

c. **Invite others to your surroundings** – opening your surroundings to others will enable productive scientific argumentation[23]. This process involves listening, talking carefully, justify claims held from building your story and surroundings. Discussion of ideas using reasoning and evidence should take place. Role-play with invited guest, other students taking the course or with built-in avatars.

Disruptors will occur during the various intervals. Disruptions can come in many forms and create fun or strange challenges to get through.

[Passion]

Deepen the emotional connection to the content and take the learning outside. Your device will track how often you use the skills, content, or knowledge obtained during the play section. At various locations and times, you will be presented with activities, challenges or tips to deepen the connection.

[Pause]

Reflection time

Revisit this cycle or move to the next cycle.

Comparing Alternative Future Curricula Designs

Frame, Find, Play, Plan, Make, Try Design

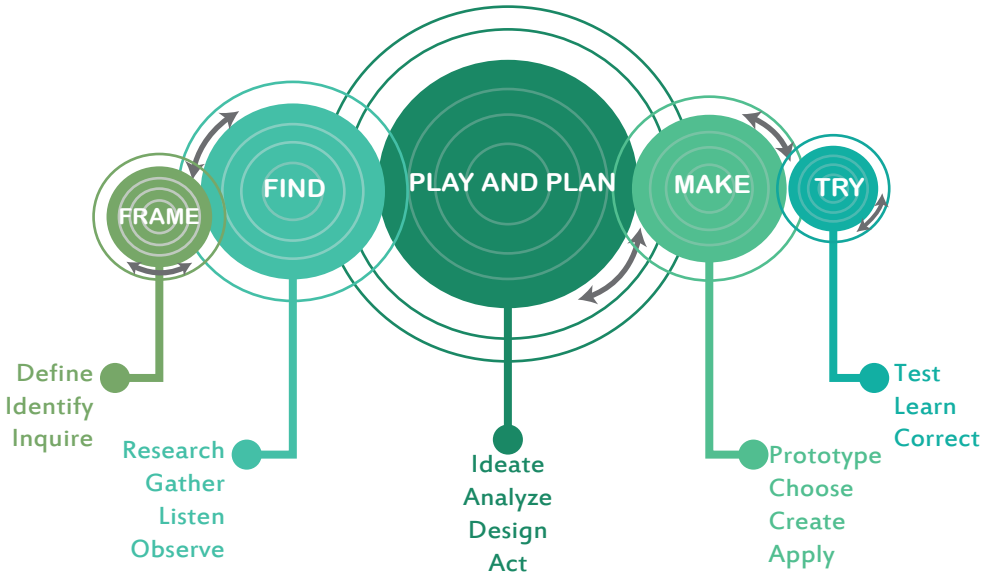


Figure 7| Learning by design thinking (source: http://publicmuseumschool.org/curriculum/)

This curriculum was designed for a blended competency-based learning space, organized by a facilitator computer team. It is able to fit into existing higher education systems with less effort. This design has five major sections that can be revisited at any time. It is designed so that students can jump in at any point as each stage acts as a standalone section housing its own competency scoring. The main goals of each section are as follows:

- **Frame:** Students are encouraged to inquire about and define the content. They should identify problems they want to solve using the content from the course and what opportunities they want to gain.
- **Find:** in this section, the aim is to increase students' curiosity about the content and the relationships to the content. Students need to research, observe and realize that answers are everywhere.
- **Play and plan:** What is learning without playing? Playing allows you to understand the concepts without feeling that perfection is necessary. This area is used to highlight the power of brainstorming and analysis.
- **Make:** Learning by doing is the aim of this section. Here students bring their ideas alive.
- **Try:** In the end building confidence in one's designs and products. The solutions created that can be used immediately and allow students to understand failure and constructive criticism.

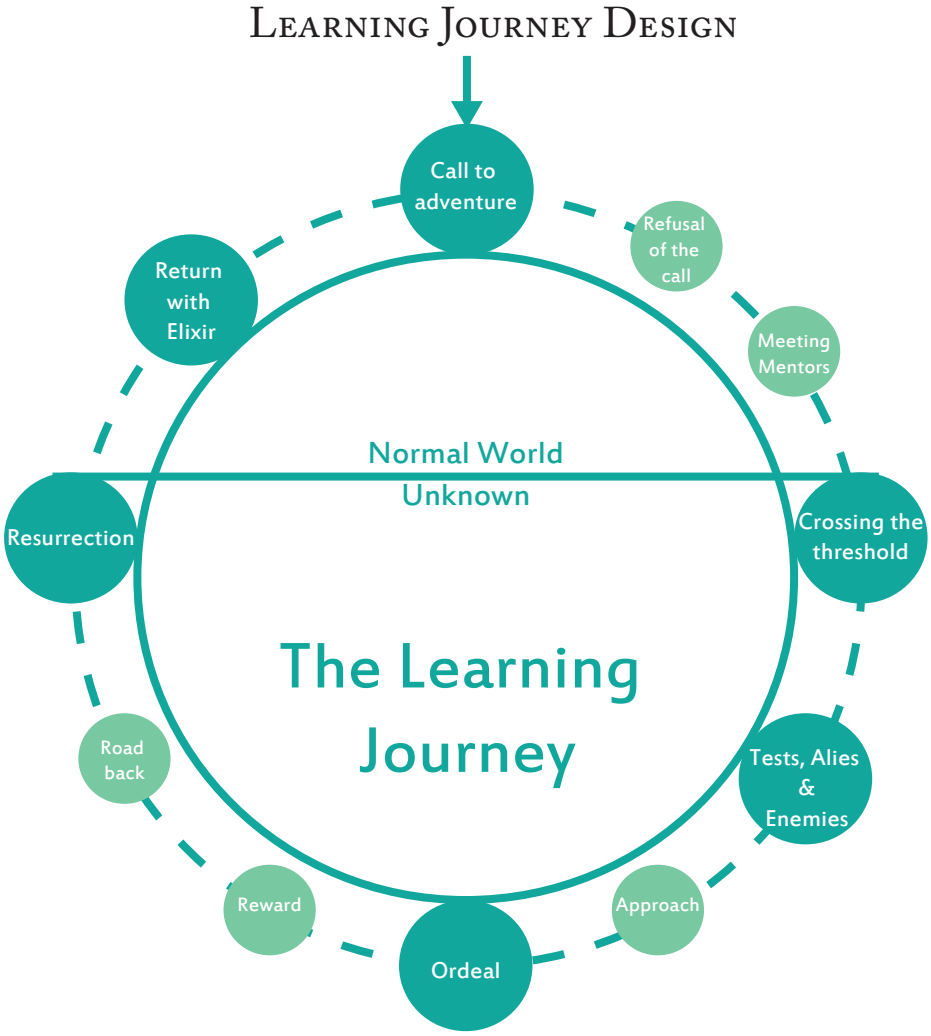


Figure 8| The Hero's Journey - The Learning Journey (source: http://thinkingfutures.net/framework/)

This curriculum design was inspired by the Hero's Journey process used in literature. It shows the dramatic storytelling side of learning filled creates adventures at every corner. The phases should be completed in order, but the duration of each phase is not defined. The learning journey is not designed to be taken alone but with a learning group, that is carefully selected based on individual interest, competencies, personalities, etc. Groups make almost every decision together and assessments are endorsement-based. The curriculum's content should closely link to the issues of the day and designed by supporting organizations, coaches, and groups. The content is intended for a virtual and augmented reality learning environments.

The curriculum aims to emphasize that learning is a journey and when done in a group it can be fun and beneficial. This curriculum could be adapted and used for Executive Education in organizations. It promotes learning as a group activity and involves students, organizations, and agencies that the core content is based on to be a crucial part of the curriculum design.

Purpose, Play, Passion Design

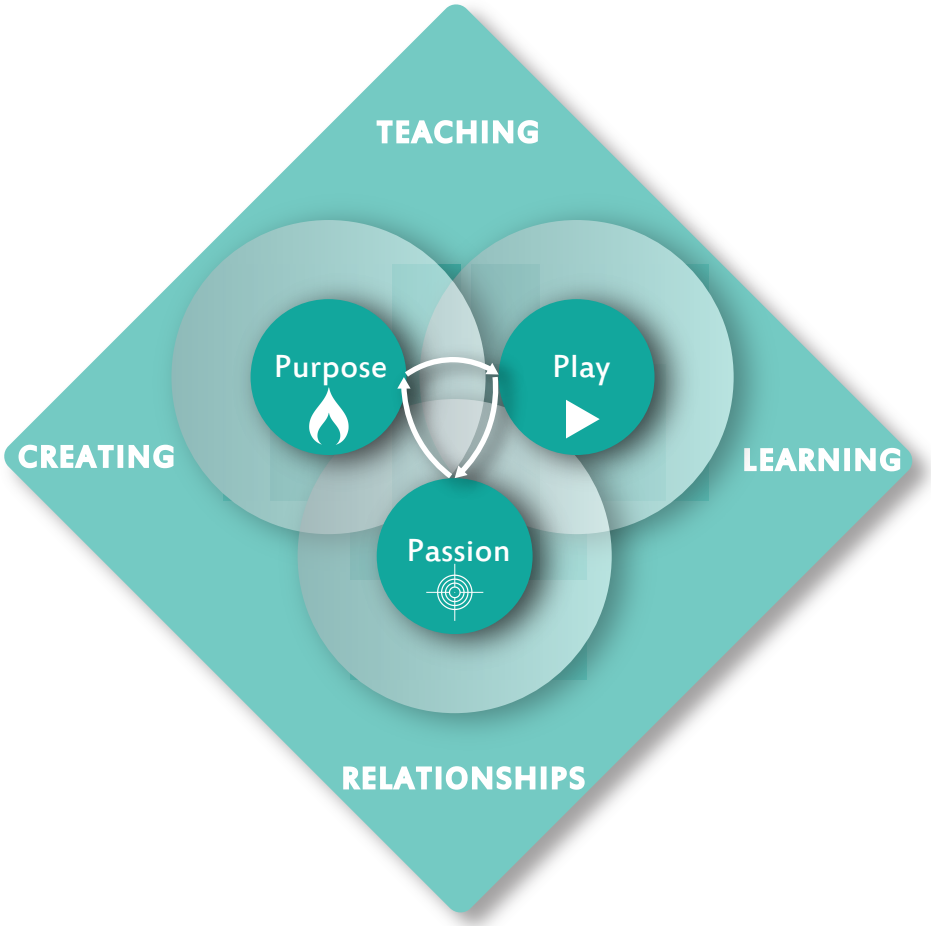


Figure 9| Purpose - Play - Passion and Repeat

This curriculum was designed for a blended learning space. It has a cyclical feel that is the courses are done in cycles allowing students to build on their knowledge from the previous cycle of course. It is aimed to make individuals comfortable with the course and become experts in the field if they wish to. The first step is to allow individuals to specify the purpose of learning specific content. Students are given the ability to set their own goals and outcomes, which are, then used in the assessment and delivery of badges. Next, the play section where students construct the world they want to learn in and complete activities within this world. Next is the development passion for the content. This happens when the students try to infuse the knowledge into their everyday life through specified challenges and otherwise.

Table 2 is a table showing how each curricula design can aid learning, transform education and enable better outcomes and feedback.

Table 8| Comparing Curricula Design

	Frame, Find, Play, Plan, Make, Try	Learning Journey	Purpose, Play, Passion
Adaptable, Personalized and values students input in curriculum design	L	H	H
Utilizes ubiquitous computing technology	H	H	H
Competency based assessment	H	M	M
Geared towards practical skills development	M	H	H
Creates strong social ties	L	H	L
Open feedback structure	L	H	L
Access to in person coaches/mentors	H	L	M
Promotes active learning and play	M	H	H
Encourages creativity and open exploration	H	H	H
Real world application / Straight to Job Skills	H	H	H
Applicability to low income communities with in efficient technology	M	M	H

H – High performance
M – Medium performance
L – Low performance

[12] Reference to Connectivism Theory of Learning in the Digital Age (Siemens, 2005)

[13] The Carnegie Unit is 120 hours of class or contact time with an instructor over the course of a year at the secondary (American high school) level. It is a strictly time-based reference for measuring educational attainment used by American universities and colleges; the Carnegie Unit assesses secondary school attainment (Shedd, 2003).

[14] Finland's plans to integrate classic school subjects such as history or English with broader, cross-cutting "topics" as part of a major education. All children will also learn via periods looking at broader topics, such as the European Union or community and climate change, which would bring in multi-disciplinary modules on languages, geography, sciences and economics (Strauss, 2015).

[15] Inspired by the Behaviourism theory

[16] Hero's Journey is a pattern of narrative identified by American Scholar Joseph Campbell that appears in storytelling myths and psychological development. It describes the typical adventure of an archetype known as the Hero (Vogler)

[17] The polymerase chain reaction (PCR) is a biochemical technology in molecular biology used to amplify a single copy or a few copies of a piece of DNA across several orders of magnitude, generating thousands to millions of copies of a particular DNA sequence. https://www.boundless.com/microbiology/textbooks/boundless-microbiology-textbook/microbial-genetics-7/bioinformatics-83/amplifying-dna-the-polymerase-chain-reaction-458-5372/

[18] Idea based on "Chinas social credit". - http://www.bbc.com/news/world-asia-china-34592186

Link for algorithmic angel - http://techcrunch.com/2015/04/18/we-need-algorithmic-angels/

[19] Bad or Dirty Data refers to information that can be erroneous, misleading, and without general formatting.

Read more at http://www.business2community.com/big-data/bad-data-side-effects-01164045#yZ9FDujI9L7R8rBb.99

[20] Centaur – a team made up of the combined speed and depth of artificial intelligence and the strategic vision of a human expert. Recordedfuture.com (2016). Building Threat Analyst Centaurs Using Artificial Intelligence https://www.recordedfuture.com/artificial-threat-intelligence/

[21] http://www.fastcompany.com/3049532/the-future-of-work/heres-why-the-freelancer-economy-is-on-the-rise

http://blog.cloudpeeps.com/freelance-trends-of-2016/

http://www.fastcompany.com/3049857/the-future-of-work/5-major-ways-freelancers-will-change-the-economy-by-2040

[22] This involves reasoning and arguing from available evidence in order to improve and refute ideas, explanations, while communicating understanding through precise language.

[23] This involves reasoning and arguing from available evidence in order to improve and refute ideas, explanations, while communicating understanding through precise language.

Conclusion

Models of traditional education are becoming less relevant. To avoid Confucius' sense of danger of "thinking without learning" or his sense of loss of learning without thinking, we need new models of learning that move education outside of the classroom walls into every aspect of our lives. As we move closer to the true realization of ubiquitous computing, we should continue to incorporate technological elements into the education system to enable these new models.

As I journeyed through the creation of alternative futures of learning in higher education, I found that learning with the help of ubiquitous computing can adapt and transform to create better outcomes for students in higher education and offer well-defined feedback structures with the support of increased communication opportunities between the stakeholders of learning. These stakeholders are the students (the past, present, and future), teachers, parents, the technological companies, organizations, entrepreneurs, social media, governments, the community, policy makers, economists, and others. Higher institutions could look to increase cross-institutional and cross-country collaborations. Technology could play a great role in these collaborations. Parr (2015) stated that mutually beneficial partnerships and belonging to a larger ecosystem could help higher education institutions have hope at long-term survival and relevance. Another element that would be beneficial to students and ensure that higher education institution remains relevant is the conversation about new payment and funding model for learning to ensure that it becomes available to everyone.

Conversations could then emerge that helps education move beyond the silos created between the

different education levels, creating a learning journey that does not end with a high school diploma, Bachelor's degree, Master's degree or Ph.D., but fostering the forever learning journey from birth. With a breakdown of these silos, a restructuring of the degree system could continue by opening it up to more creativity, risks, and methods. Organizations are making it known that traditional degrees are not fully effective to create a diverse work pool and ease the skills shortage many organizations face (Coughlan, 2016). Restructuring the degree system gives higher education institutions the ability to refocus just what the student is learning, vary the time it takes to be deemed qualified, and redesign programs to be more relevant and future proofed. Opening up the degree system to credentials, badges, endorsements and other forms of competency ratings gives everyone a chance of displaying their skills to the public.

With more opportunities for diverse thinking, solutions and tools that are more robust, and answers available everywhere, students can start analyzing their own learning by using secure, efficient and effective ubiquitous computing technology, big data, learning analytics and artificial intelligence. This can break education out of the classroom, help build better pedagogies, empower students to take an active part in their learning, and assess factors affecting their understanding and success (Parr, 2015). Skills such as sense-making, adaptive thinking, social intelligence, design mindset, virtual collaboration, and transdisciplinarity[24] are integrated into the learning diet as they are essential to navigating through the future of learning (Davies, Fidler, & Gorbis, 2011). By blending lifelong skills with classic methods, technological devices, workplace experience, remote internships, immersive simulated apprenticeships, conflict resolution, and sustainable design.

What is next?

The best way to predict the future is to have a hand in creating it. As such, my aim is to bring versions of this research to fruition. Thus below are some proposed steps to take my ideas to the next level.

- Conduct interviews with professors, instructional designers, curriculum designers, and educational technologist, to discuss issues surrounding the future of higher education, new curriculum designs, learning analytics and ubiquitous computing within higher education and K-12.
- Focus groups with students across disciplines and age groups, to gain a wide-range of insights regarding learning in current higher education systems, current curriculums designs, learning analytics and ubiquitous computing possibilities amongst other topics.

- Apply the three curriculum designs to varying disciplines with input from professors, instructional designers, and students in these disciplines, incorporating nuances of each discipline into curriculum structures. The first designs would be without learning analytics software simply using the professor's knowledge of students, students' preferences based on interviews, surveys, and online data collection.
- Allow students in the focus group to analyze and comment on the curriculum design.
- With the results, integrate findings and the best ideas of each curriculum and adaptable curriculum designs to be presented to the professors and instructional designers that assisted.
- Connect with education technology companies, learning analytics designers, Internet of things creators, MOOCs, and other online learning institutions to discuss new forms of curriculum designs to foster different learning outcomes. Testing them and implementing learning analytics software that can accompany the big ideas.

The big and ultimate next step has been my dream since 2007 and that is to open up my very own school in my home country, of Jamaica, aimed at providing holistic education. This institution will incorporate the enhanced version of the curricula, technologies, theories, and strategies highlighted in this research paper. Even though the research is tailored for a higher education system, my overall aim is to create a lifelong learning culture, allowing children to have the opportunity to have a bigger hand in their educational journey right from the start.

[24] Transdisciplinarity is literacy in and ability to understand concepts across multiple disciplines (Davies, Fidler, & Gorbis, 2011).

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