Next Generation Digital Learning Environment (NGDLE)

Conference Paper · November 2019

CITATIONS
4

READS
50

2 authors, including:

Rexhep Mustafovski
Goce Delcev University
24 PUBLICATIONS **7** CITATIONS

SEE PROFILE

Next Generation Digital Learning Environment (NGDLE)

R Mustafovski[1] and B Temelkovski[2]

[1,2]Military Academy "General MihailoApostolski", GoceDelchev University, ul. VaskoKarangelevski b.b, 1000 Skopje, North Macedonia

Abstract. Today, the global educational landscape is changing due to the advancement of technologies and services, where some have termed it as the „climate change“ in our education. The students of today engage with the learning environment differently from the students of yesterday, due to many climate changes that happened in the last years. The traditional landscape is often perceived as „formal“, „passive“, „direct“ and „push“ learning environmentdesigned largely for the knowledge consumers where the students results of learning were lower, and the modern landscape is often perceived as „informal“, „active“, „collaborative“, „social“ and „pull“ learning environment designed not only for the knowledge consumers, but also for the knowledge creators where the student results of learning are higher than before. This paradigm shift in education and learning is imminent and has gathered a lot of interest in the recent years to create and adapt the education and learning environment for this century. An exciting path forward in achieving the New Generation Digital Learning Environment (NGDLE) vision is a next generation learning system designed to create great learning experiences that improve learning outcomes. This learning system will understand learning outcomes, learner assessment, the learner record, and how to launch the right learning moment for each student.

1.Introduction

Now, in our society many institutions for higher education aspire to make the education more personal and more flexible. They also strive to provide digital education system that matches the learning needs of each individual student. With information technology (IT) it is possible everyone to study and work from distance. Today it has been widely acknowledged that studying or learning can happen also in different places than the traditional classroom. The purpose of Next Generation Digital Learning Environment (NGDLE) is to design a digital learning system that will improve the learning skills, learning outcomes and learning experience of students. This digital learning system will understand the learning outcomes, learner assessment, the learner record and how to launch the right learning moments for each student. The Next Generation Digital Learning Environment (NGDLE) is conceived as an ecosystem or a learning environment consisting of different learning tools and different components that adhere to common standards.

2. Importance of technology in education

Education institutions, like all service organizations in the digital information era, must seek every means to enhance quality of service delivery and drive efficiency and cost-savings. In other words, the journey for digital transformation in education should lead to a broader vision that enables constant innovation and enhancement of teaching and learning all the students where it also must improve the operational efficiencies of administrative and management services for the students, educators and for the community [1].

The observation of forward-thinking education institution shows that the right integration of technology and pedagogy with the strategic and operational vision of the university is essential for the return on investment and continued success of digital initiatives. This type of approach can help the institution ensure all digital learning environments – both physical and virtual – can meet the changing needs of education, the labor market and community of this century. Historically, education institutions adopted digital technology in education with the purpose to increase the efficiency of university administrative processes such as scheduling classes, managing different budget, tracking in

different ways the students, reducing the operational cost of energy in the buildings, enhancing safety and security and also providing different informational tools for staff, academics, students and researchers [3].

After many years, the forward-thinking educational institutions are now seeing the power of technology in education to transform the learning environments, merging the physical with the virtual and realizing better student outcomes. These different institutions understand the current change of dynamics, and are moving rapidly to innovate and transform their different business models, acknowledging the evolving role of faculty or university, understanding the requirements of the students, of the future, and examining their educational delivery methodologies. The leaders of this century who are still of the mind that only modest incremental shifts are necessary to increase the results of learning could miss the next generation of learning and teaching and for this reason the next generation digital learning environments are so important, because they can help the increase of the positive results on learning of the students [4].

Now, it should be clear that education as an industry is poised to go through a monumental shift that will leave some wondering what happened to the traditional university or college campus. The potential for disruption in this community is high as new technologies, as well as new generation of student, come onto the scene [2].

Some of the impacts of digital disruption in education are seen through student demand for changes in traditional processes of teaching and learning such as:

- Should mobile devices and personal computers be banned in class?
- Do students really need to attend lectures in person?
- Why aren't video – recorded lectures and other course materials readily available to help all the students learn more effectively and reach those who may not be able to attend class?

Other type of questions that shows the level of vulnerability that now the education industry faces with the digital disruption wave, such as:

- How can traditional modes of classroom instruction engage and inspire students when life outside the classroom now has changed so dramatically?
- What does it mean when students are not receiving education that prepares them effectively for a job market that is changing so rapidly?
- What happens when students stop coming to class?

Now, most universities and colleges have still not completed a transformation of their physical learning environments. Classrooms, libraries, auditoriums, cafeterias, study spaces, and campuses overall are still largely based on dated, traditional models. Today, not only are virtual teaching and learning nonexistent, but also many universities, colleges and campuses are far from conceptualizing the physical with the virtual, which helps more students to be successful in studying and learning in this century [5]. Leaders from different fields complain that universities, colleges, and different traditional institutions for studying and teaching are not producing adequately prepared job applicants, where many studies and researchers show that there is a big difference between a recent graduated student and the employer who worked for many years and has a lot of experience in that field of work. For these reasons many countries now try to involve the technology in universities and colleges to improve and increase the results of students, which can make the new leaders ready to work and learn in any field. Digital disruption in the industry will force universities and colleges to transform their learning environments in both ways,physical and virtual, as part of the way courses and classes are taught [6]. This kind of change will meet the expectations of the students, citizens and employers of this century. The way to realize success in the future, the forward – thinking universities and colleges need to find new, innovative and creative ways to attract and retain students and faculty, to

differentiate themselves from their peers and in effective way to demonstrate the value of a degree from their different institutionswhile simultaneously evolving the institutions business model [4].
The positive impact of digitally transformed environments will not come by simply presenting and arranging content in virtualized or even in more different personalized ways. Rather, it will come through the synergistic combination of benefits for different stakeholders such as: leadership, teachers, staff, and even necessarily students and the community. The digitally transformed learning environments, which are properly designed and implanted in higher educational institutions according to strong pedagogical practices among many years can indeed function as a set of different tools and different processes that augment human learning or studying and intellectual capability [3].

Benefits for students:

Students will benefit from the online component of socially and collaborative networked learning and studying, and they every time will be able to choose and build an approach based on how the best learn, study and teach through a smart curriculum path that is more relevant to their personal context and their different areas of interest. Students will be more actively engaged, have a better learning and studying experience or opportunity, be better prepared for the careers of the future, because they are the leaders of this century and every day to find different, new, creative, and innovative ways to solve problems in the way to help more the community.
Benefits for teachers:

Teachers will be able to innovate their different teaching methods and ways, and every time to try to make their classes more engaging, interesting, creative, collaborative and effective. Whether working with a single student or a large number of students face – to – face or on – line, they will be able every time to make timely, targeted interventions and provide personalized feedback to individuals along the way.

Benefits for the institution:

The adoption of new learning and studying technology in higher educational institutions will enable innovative and creative solutions that promise to improve learning and studying processes while enhancing the cost effectiveness of campus services and different tools. Integrated information systems, based on a connected and secure environment, will help leaders identify and manage key impact areas that they would like to prioritize for focus and investment and to determine the type of experience they would like to deliver across all constituents such as: faculty, administrative leaders, staff and students.

3. Proposed framework for digital transformation in education

While now, in this millennium, there are many paths education institutions can take to transform, there are some key design principles that are critical for all leaders to consider as they look to build a more effective plan and ensure successful implementation through the major market transitions they are experiencing. From helping to define a vision, identifying gaps to providing a unifying technology architectural design and a comprehensive set of solutions that address these different gaps, this kind of framework will help education institutions transform two major dimensions: safety and security, and research and knowledge.

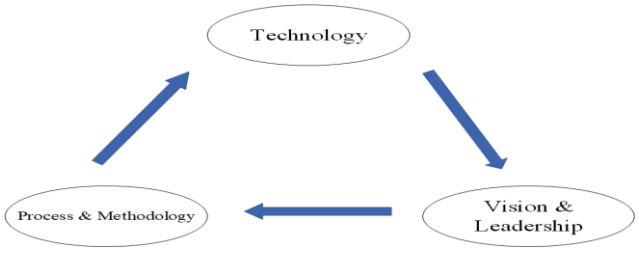

Figure 1. Framework for digital transformation in education.

3.1.Process and methodology

The process and methodology of transforming learning and studying environments should focus on creating the right capabilities for educators to adopt effective teaching methodologies and innovation that put the learner at the heart of the learning process, whether engagement is face – to – face, at a distance or through blended learning modes. These include collaborative knowledge and different learning methodologies that foster innovative approaches to empower learners to develop key competences and succeed in this century such as: flipped learning, project – based learning, adaptive learning and personalized learning [3]. The impact of the new technology makes it possible to create new environments where students get what they need and when they need it. Now, the new social collaboration spaces or environments make it easier for educators and students to connect before, during, and after traditional or virtual classes. These spaces or environments create persistent learning environments with ongoing interaction that helps the educator serve as a coach and mentor to students and that enables students to help one another [4]. This is why now the process of defining how transformed learning spaces or environments will look must consider the teaching methods that will provide the types of experiences we want to deliver to educators, staff and students such as:

- For students to take classes anywhere, anytime or on any device
- To deliver a range of learning models, including online, hybrid and flipped learning
- To connect with outside experts and bring them into courses as lecturers or guest educators
- To work with other universities and colleges in the area, state or nation to share courses, content and educators, thus increasing the number of courses offered and the number of students served
- For faculty, staff and students to connect seamlessly to the network
- To ensure a secure, safe and reliable network
- To help ensure student safety across the campus
- To easily obtain cost – effective storage, compute and processing resources for researchers
- For educators, staff and students to connect and collaborate, regardless of location

3.2. Technology

Technology in this century plays a key role not only in enabling new ways and methods of learning and studying, but also in establishing new business models required to drive the very transformation that institutions for higher education are trying hard to effect it [3]. Today's students always demand an access to the network, information and resources, needed to realize success, such as:

- They expect speed in their wireless access and a simple and seamless online interface to their courses, administrative or academic information and student services or tools.
- They want access to information when they need it and where they can most easily find it.
- They want to attend classes anytime, anywhere. They do not necessarily want to physically attend every class.
- They want a persistent social and collaborative environment that is easy to find and that creates a continual learning and studying environments before, during and after class.

Some of the key success factors of a digital education platform rely on the core network infrastructure such as: wired and wireless connectivity and the underlying cybersecurity solutions that enable everything what is essentially the heartbeat of an institution [4].
Everything that follows is dependent on a strong, reliable core network that ensures:

- The network: ubiquitous campus connectivity;
- Cybersecurity;
- Virtualization of the digital campus, and
- Collaboration and personalization for distance and blended learning.

Each of these layers of technology delivers specific roles and benefits to ensure the success of a digital transformation roadmap implementation.

3.2.1. The network: ubiquitous campus connectivity

It is important now the infrastructure to be stable, reliable, capable and scalable of handling an increased rate of traffic from the explosion of mobile devices and personal computers, the use of video and the implementation of new applications for communications and collaboration [3]. The network represents the confluence of multiple technology trends, such as:

- Mobility (ubiquitous, high – speed mobile networks, different smart devices and applications)
- Cloud computing, social networks, instant collaboration with anyone, anywhere
- Data analytics
- An explosion in connected things, including different sensors and cameras

Today, the network must be secure, safe, reliable, wired and wireless, easy to manage and administer and designed to meet future growth requirements for the connection of people, processes, things and data [4].

3.2.2. Cybersecurity

Cybersecurity has become an enormous issue across all markets, but particularly in education. The education sector is among the top three most vulnerable targets for cyberattacks. The expected academic culture of open access to knowledge and information for better research innovation has created a unique and growing up challenge not only for the information technology (IT), but also for senior management protecting confidential and sensitive information against threats and attacks over the Internet [2]. Best practices from education institutions highly recommended a strategic and holistic cybersecurity plan and idea that combines a robust technology and architecture, people awareness and training, and security policies and different data management processes [4].

3.2.3. Virtualization of the digital campus

An intelligent digital campus allows for the connection of people, data and different things [3]. It incorporates a wide range of applications operating over the platform to support the business of the university and college, where it enables outdoor teaching and learning activities and delivers a good student, such as:

- Student services
- Campus Wi – Fi
- Smart buildings
- Smart parking
- Smart lighting
- Campus security systems