

February 21, 2020

For this task I had selected Smart Learning Environments (SLE).

Education dropout rates, exam failure and low quality educations express a hidden discontent with the system and a demand to a different kind of education. Education must be an experience that is more engaging, context-aware, aware of learners-needs and preferences, rewarding and relevant to the skills people will need in for the 21st century., . (Leadbeater, 2010).

At the same time in regular educational system good teachers are central to learning in schools. However a large number of communities of the developing world like refugee camps, rural areas, remote areas, conflict regions, very poor regions and slums do not have resources to employ or event attract good teachers, neither to have the technological resources (UNESCO, 2015) (Leadbeater, 2010)

Smart Learning Environments is a candidate to fulfil these scenarios, gaps and demands.

In Figure 1 Sung represents SLE by extending the characteristics of traditional school system: time by self-directed, methods by motivation, competencies by adaptive, contents by resource-enriched and technology-embedded by spaces. (Sung, 2015)

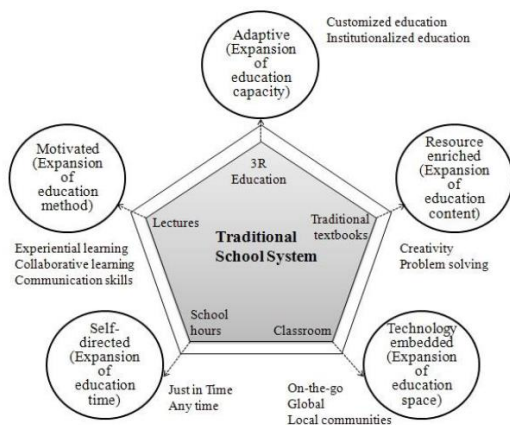


Figure 1 - Concepts of SL by Sung (2015)

Self-directed allows just-in time and any-time learning, improving the educational time .

Motivated provides experiential and collaborative activities, improving the educational methods.

Adaptive provides customized and individualized learning, improving the educational capacities.

Resource-enriched facilitates various educational resources, improving the educational content.

Technology-embedded offers local and global networks of communication, improving spaces.

According to Shoikova . et al. “*Smart learning environments represent a new wave of educational systems, involving an effective and efficient interplay of pedagogy, technology and their fusion towards the betterment of learning processes. Smart learning environments involve context-awareness that can combine a physical classroom with many virtual learning environments*” (Shoikova, 2017) .

SLE is context-aware and adaptive to the individual learner’s behaviour. It is available in any place, at any time, in any way, and with any pace, providing the necessary learning guidance, supportive tools or learning suggestions for learners (Zhuang et al, 2017) (Hwang, 2014).

Koper points out that smart learning environments are physical environments, which are improved to promote better and faster learning. (Koper, 2014).

Smart learning environments can be found in formal or informal learning where they both complemented each other. SLE must integrate both in order to create autonomous adaptive learning

environments to support individual learners. These environments need to use big data and learning analytics techniques to integrate real-time information about learners' location and historical data to identify meaningful learning patterns. (UNESCO, 2015)

Learning environments setting in a city mostly include school, family, community, workplace and public place learning environments (Zhuang, 2017).

Informal learning environments outside school are not alternative types of school but alternatives to school, which make learning available without a school structure, classroom, teacher, timetable, or exam. (Leadbeater, 2010). They can be adapted facilities used for other purposes, such as people's homes, public spaces, community centres. The learning setting include activities that happen, for example, in the workplace, the local community and in everyday life.

The main idea behind SLE is to update the way of learning to 21st century, minimizing people exclusion and promoting learners to become autonomous with respect to their learning by making them the protagonists of the learning process. It also focus on attracting people to learning by making learning enjoyable, engaging, and useful.

The goals of SLE are to offer personalized, timely, accurate, seamless, rich, and supportive learning experience in formal and informal learning scenarios. (Spector, 2016)

For Kim et al. the goal of SLE is to provide *"self-learning, self-motivated and personalized services which learners can attend courses at their own pace and are able to access the personalized learning content according to their personal difference"* .(Kim, 2013)

Zhu et al. identifies ten key features of smart learning environments (Zhu, 2016) :

1. Location-Aware: Sense learner's location in real time.
2. Context-Aware: Explore different scenarios and information of activity.
3. Socially Aware: Sense social relationship.
4. Interoperability: Set standard between different resources, services and platforms.
5. Seamless Connection: Provide continuous service when any device connects.
6. Adaptability: Push learning resource according to learning access, preference and demand.
7. Ubiquitous: Predict learner's demand until express clearly, provide visual and transparent way to access learning resource and service to learner.
8. Whole Record: Record learning path data to mine and analyze deeply, then give reasonable assessment, suggestion and push on-demand service.
9. Natural Interaction: Transfer the senses of multimodal interaction including position and facial expression recognition.
10. High Engagement: Immersing in multidirectional interaction learning experience in technology environment.

According to Hwang (2014), the potential criteria of SLEs are context-aware, can offer instant and adaptive support, can adapt the user interface and the subject contents to meet the personal factors, and learning status of individual learners.

The main **advantages** are

1. It is an important alternative for absentee since learners can access lectures at any time and from anywhere.
2. Digital tools help understand topics better
3. It promotes interactive teaching environment and fun learning with the advanced and variety on gamification.
4. It allows the learning with experts for each subject / topic
5. Fun filled learning: The use of digital tools makes learning sessions more fun filled with advanced levels of gamification.
6. Promotes collaborative learning options.
7. Improves the curiosity, creativity and concentrations of learners since there is no need for the teacher to write on the board thus avoids the trouble of making notes while the lecture is in progress
8. It compromises with eco-friendly classes by learning without the need to use paper and pen
9. It recommends learning tools or strategies providing learning guidance or support across discipline
10. It allows for the tailoring of learning objectives and content based on learners preferences and needs

However there are some **disadvantages** with SLE that should be taken into account

1. Cultural barriers and resistant to changes.
2. Non-solved yet important and relevant shortcoming and laws with respect to data privacy and internet security.
3. Outstanding Cost of smart devices and maintenance of school abreast with the latest technologies.
4. The lack and/or cost of connectivity.
5. The lack of global compromise to open & free educational resources and systems.
6. The cost and complexity of going through the process of hybrid educational environments from conventional education towards SVE.
7. The frustration and complexity of contingency alternatives due to gadgets malfunctions and cuts on connectivity.
8. Parents of students are a generation behind the technologically-educative student community. In such a case, they as the all-time guardians of their children will fail to offer any sort of educational assistance. Children of such parents will be at a loss when they cannot bank on their parents to complete their academic projects or homework.

Some examples for concrete learning environments setting

1. Plan Ceibal teaching English as a second Language (ESL) – Uruguay

Plan Ceibal fits better into TELE category for the following reasons:

- Allows for multiple usage of the same learning space for diverse pedagogies. By non in Ceibal ESL it only applies for teaching ESL.
- Supports students to acquire skills and knowledge in English as a foreign language.
- Supports expert teachers to transfer knowledge and learning contents for all.
- Engages students in collaborative learning since work and participation is collaborative.
- Ceibal provides communication, technology to schools and to each student.

Bibliography

- Hwang, G.-J. (2014). Definition, framework and research issues of smart learning environments - a context-aware ubiquitous learning perspective. *Smart Learning Environments*, 1:4. doi:10.1186/s40561-014-0004-5.
- Koper, R. (2014). Conditions for effective smart learning environments. *Smart Learn. Environ.*, 1,5. doi:10.1186/s40561-014-0005-4
- Leadbeater, C. a. (2010). Learning from the Extremes. *Cisco Public Information*.
- Shoikova, E. &. (2017). Conceptualising of Smart Education. *SCIENTIFIC JOURNAL "ELECTROTECHNICA & ELECTRONICA" (E+E)*, p. 29-37. 3-4.
- Spector, J. (2016). *Smart Learning Environments - Concepts and Issues*.
- Sung, M. (2015). A Study of Adults' Perception and Needs for Smart Learning. *Procedia - Social and Behavioral Sciences*, 191.
- T. Kim, J. C. (2013). Evolution to smart learning in public education: a case study of Korean public education. *Open and Social Technologies for Networked Learning*, 170–178.
- UNESCO. (2015). Rethinking Education: Towards a Global Common Good? *UNESCO Publishing*,. Paris.
- Zhu, Z. Y. (2016). A research framework of smart education. *Smart Learn. Environ.*, 11. doi:10.1186/s40561-016-0026-2
- Zhuang et al, R. &. (2017). Smart learning environments for a smart city: from the perspective of lifelong and lifewide learning. *Smart Learning Environments*., (p. 4). doi:10.1186/s40561-017-0044-8