# The Learning Challenges and Pedagogical Perspective in a Complex Education System

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**ABSTRACT─** *It has become obvious that among the most difficult problems faced by the educational system today are those associated with teaching-learning effectiveness. It is widely argued that these current educational systems, structures and practices are not sufficient to address and support the learning needs of all students in the 21st century. The rapid changes and increased complexity of today's world present new challenges and put new demands on the teaching-learning goals. Generally, there has been growing awareness of the necessity to change and improve the preparation of students for productive functioning in the continually changing and demanding society. In confronting this challenge, it is necessary to consider the complexity of the educational system itself and the multitude of problems that must be addressed. We must recognize that no single or uniform approach can be applied to completely overcome the challenges facing the expected outcome of the teaching-learning goals. Consequently, any strategy for change must contend with the diverse factors affecting our educational systems, the interactions of its parts, and the intricate interdependencies within it and with its environment. This review study focused on the educational goal, key issues in the teaching perspective of education, making teaching and learning process more effective, students learning styles and preferences among others.*

**Keywords─** Complex education system, Effective teaching, Learning style, Teaching-learning outcome

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## 1. INTRODUCTION

Education in its general sense could be considered as a form of learning in which knowledge, skills and habits of a group of people are transferred from one generation to the next through teaching, training, or research. Any experience that has a formative effect on the way one thinks, feels, or acts may be considered as educational. A person's education often takes place under the guidance of others, but may also occur through autodidactic. People are more aware of the saying that education is the key to one's success in life. No matter the nature of problem one is dealing with, the solution always include at least, one component of education.

When educating today's and tomorrow's generations to be valuable citizens that contribute to societal development, the educators must connect subject matter with the places and issues that affect us all, connect learning with real life, and provide people with a certain minimal common background (Bar-Yam, Kathleen, Sweeney, Kaput, & Bar-Yam, 2000). Building and maintaining a well-performing educational system, which is able to cope with the complexity of modern societies is a very challenging task. Learning is itself a highly complex process which involves many different factors and perspectives, such as individual sense-making, teacher-student relationships, classroom dynamics, school organizations, parental/guardian roles, community involvement, bodies of knowledge, and culture (Davis & Sumara, 2006); knowing, knowing how to do, and knowing how to be (Lelouche & Morin, 1997).

Due to its distributed nature, the educational system has weak interdependences between individual classrooms and between individual schools. For instance, what happens at one local school does not automatically have much to do with what happens at other schools, in other neighbourhoods or other cities. Schools are strongly influenced by local conditions, and within a certain school, what happens inside a certain classroom is strongly dependent on the teacher, the course to be taught, the students and their parents, and these often lead to random quality (Heylighen, 1996).

Much is already known about how young people learn and what motivates their interest but a considerable gap exists between this finding and the approach to teaching and learning employed by many schools and educators (Urdan & Klein, 1998). Implementation is most effective when educators understand the broad theoretical principles that underlie these strategies and use this information to shape and evaluate their practice. Each segment of the society: the families, community members, private and non-profit sectors, government, faith communities, students as well as the schools has

distinct responsibility in preparing young people for future success. Success includes living productive lives, engaging in lifelong learning, finding gainful employment, and contributing to civic life. To close the gap between living and learning, all stakeholders including students need to work together in bringing these real world approaches to the classroom. From the word of Abigail Adam; "*Learning is not attained by chance; it must be sought for with ardor and attended to with diligence*". The Partnership for 21st Century Skills (PCS) believes that making the connection between learning and the real world is imperative for learner's success. Thus, education system faces irrelevance unless educators bridge the gap between how learners live and how they learn.

## 2. EDUCATIONAL GOAL

The current educational policy typically concentrates on the issues of diversity, equity and inclusivity in relation to a group of learners and communities where educational success has lagged behind. There is a recognition that these learners' and communities' needs have not been well met by the educational system in the past, and the major goal of the current system is therefore, to address the needs of diverse learners in order to raise the overall achievement levels and reduce disparity (Bolstad, Gilbert, McDowall, Bull, Boyd, & Hipkins, 2012). According to Davis & Sumara (2006), there is a considerable philosophical controversy about the purpose or effect of education. However, most education policy statements recognized that learning extends beyond subject expertise to personal and social development, practical and moral applications as well as critical thinking. Consequently, learning should help individuals develop the intellectual, personal and social resources that will enable them to participate as active citizens who contribute to economic, social and community development as well as perform as individuals in a diverse and changing society. These demonstrate the diversity of expectations and prioritization that society and its educators must manage. Thus, there must be cohesion between the various education pathways and levels such that the individual can obtain both qualifications and competences.

## 3. KEY ISSUES IN THE TEACHING PERSPECTIVE OF EDUCATION

While there may be large disagreement over the phrasing, the idea of suitable educational teaching and learning often revolves around creating life-long learners or people who will be able to adapt to change and acquire the knowledge necessary to continually succeed outside the classroom. In a more specific context, teaching on one hand may be viewed as the transmission of knowledge by the teachers to the learners. On the other hand, teaching encompasses facilitating students' autonomous learning and self-expression. The former approach often converges toward the teaching of specified subject matter and may be termed 'convergent' teaching while the latter approach stresses open-ended, self-directed learning and hence, may be termed 'divergent' teaching. Convergent teaching approach is highly structured and teacher-centered while the students are passive recipients of knowledge transmitted to them and learning achievements are measured by standardized tests (Bar-Yam *et al.,* 2000). The divergent approach is a flexible and student-centered teaching style where the students are active participants in the learning process and learning achievements are assessed by a variety of evaluation tools such as self-evaluation in parallel to teacher evaluation, documentation portfolios and special projects.

In most educational system today, the tendency is majorly directed toward the convergent approach. Among the current suggestions for implementing educational reforms to deal with the nagging problem of achieving the desired teaching-learning outcome, there has been a strong emphasis on setting convergent goals, an aspect of which is the use of across-the-board standardized testing (Bar-Yam *et al.,* 2000). Testing has been commonly viewed as a prudent way to determine the success or failure of the teaching and learning process. There has been a relatively limited use of other means of evaluation perhaps because they are more complicated and more demanding in terms of applications and interpretations. As educators seek ways to meet the challenges and the increasing demands on educational systems, it may be helpful to recognize that there is a need for both convergent and divergent approaches to teaching and learning. The challenging question is; "how do educators find the balance between convergent and divergent approaches within the complexity of the process of teaching and learning?"

## 4. THE LEARNING PERSPECTIVE OF EDUCATION

During the latter half of the 20th century, international thinking about education began to shift to a new paradigm. This shift was driven by an awareness of massive and ongoing social, economic and technological changes, and the exponentially increasing amount of human knowledge being generated as a result. International thinking began to seriously examine questions about the role and purposes of education in a world with an unprecedented degree of complexity, fluidity and uncertainty (Bolstad et al., 2012). The basic philosophy of learning requires that students are able to integrate and apply their learning, become lifelong learners and acquire appropriate graduate attributes for living, working and managing change. With the proliferation of knowledge and rapid changes in most fields, it has become critical to develop students' capacity for self-directed learning and self growth. However, students need academic skills such as reading, writing, calculating etc as prerequisites for productive self expression.

An important development is the growing awareness that academic achievement could improve by adapting teaching to learners' individual differences. This awareness is finding its most distinct expression in the education system's attempts to deal with the issues of students with special needs. However, other aspects of adaptation to learners' individual differences and personality characteristics get far less attention. The type and manner of teaching has differential effects on the learning outcome. Students with higher ability tend to perform better under non-directive teaching methods while those with lower ability tend to do better under directive methods. This diversity of patterns of mental abilities is well recognized today, yet little has been done to develop adequate conditions aimed at adapting teaching to it (Bar-Yam *et al.,* 2000).

In general, adaptation to individual differences under convergent teaching tends to be limited. The students are all expected to strive toward one goal of learning specified required knowledge; some may attain it and others may fall by the wayside or be given some remediation with limited results (Bar-Yam *et al.,* 2000). Sometimes, there is need to give learners opportunities to use their aptitudes and inclinations for learning, which may lead to attaining higher achievements. As the learners experience success and consequently, a sense of competence, their motivation is enhanced to pursue further learning. This adaptation to individual differences may be productive because of its emphasis on student autonomous, active, self-reliant learning.

## 5. EFFECT OF LEARNING ENVIRONMENT ON THE TEACHING-LEARNING OUTCOME

Several studies have established the importance of learning environment as a key factor that can influence students' learning and achievements. Social cognitive theory proposed a relationship between environmental factors, individual personal factors and individual behaviour (Bandura, 1986). This theory hypothesized that students' generic skills result from their interaction with their environment. In the context of learning, the social cognitive theory can be explained using Biggs 3P learning model (1999), which addressed the relationship between learning environment, learning approaches, and the learning outcomes. Studies on learning approaches suggested that students' adoption of deep learning or surface learning approaches is contingent upon their experience of interacting with the learning environment. Ajayi & Adeyemi (2011), in their study noted that strong educational foundation needs adequate facilities such as blocks of classrooms, furniture, quality teachers, instructional materials, libraries, and other school equipment. These are necessary for to facilitate effective teaching-learning as well as manageable classroom population, effective classroom climate, standard student-teacher ratio and students' academic achievements among others.

Good physical working condition in any occupation can have a positive impact upon job effectiveness and morale. According to Keller (2003), it is difficult to separate teaching effectiveness from school environment. Physical surroundings (school plant) significantly impact on job satisfaction and hence job performance – teaching. Learning environment has the ability to affect a young person's development and is capable of sending strong subconscious messages, such as "this is a place where I can learn," and "I am welcome here" (Charles & Reinisch, 2011), or "I cannot cope with education in this kind of learning environment". The latter impression may lead to students' drop out of school or poor performance if endured. Poor academic performance of students particularly, in most developing countries has become a national discuss and a source of great concern to the government, parents, teachers and even student themselves. It has been observed that the quality of education does not depend on teachers performing their duties alone, but also on the effective coordination of the school environment. Omotere (2011), reported that the extent to which students' learning could be enhanced depends on their location within the school compound, the structure of their classroom, availability of instructional facilities and accessories while O'Neill (2000), noted that ambient environmental factors such as temperature, ventilation, lighting, colour and noise level affect the attitude of students and how they perceive their learning environment.

In a study on university students' perceptions of the learning environment and academic outcomes by Lizzio, Wilson, & Simons (2002), the responses of a large, cross-disciplinary sample of undergraduate students indicated that students' perceptions of their current learning environment were a stronger predictor of learning outcomes at university than prior achievement at school. Beyond the direct effects that poor facilities have on students' ability to learn; the combination of poor facilities and frustrating behavior by students including poor concentration and juvenile delinquencies create a stressful set of working conditions for teachers. Stress and job dissatisfaction are common pre-cursors to lowered teacher enthusiasm with negative consequence on the academic performance of students. According to Siegel (1999), the arrangement of space also has immediate and far reaching consequences for teacher's ability to effectively and efficiently accomplish daily activities, the formation of social and professional relationships and the sharing of information and knowledge.

## 6. MAKING TEACHING AND LEARNING PROCESS MORE EFFECTIVE

It is widely argued that the current educational systems, structures and practices are not sufficient to address and support the learning needs of all students in the 21st century. Changes are needed, but what kinds of changes, and for what reasons? (Bolstad et al., 2012). The current preparation of teachers for specific learners' age levels, specific subject matter, specific academic skills, etc does not take into consideration sufficiently the complexity of factors such as

learners' diverse characteristics. There is a strong need to train teachers to adapt instruction to the diverse student abilities, learning styles, personality traits and needs by using more differentiated teaching strategies. In addition to the preparation of teachers to more differentiated teaching, there could be more divergent use of teaching resources, with emphasis on literacy skills.

In developing literacy skills, worthwhile teaching can be done with advantageous results by persons other than the traditional classroom teachers. For example, valuable teaching can be done by peers of different ages and abilities. Also, parents, guardians, and relatives could participate in and contribute productively to the teaching process. Furthermore, teaching can be enhanced by volunteers, retirees, people with various areas of expertise from the worlds of science, business, engineering, medicine, public service, entertainment, and others. High-tech resources such as multimedia technology, computer programs, telecommunication, internet and audio-visual techniques among others can provide beneficial options especially under autodidactic learning. Student learning can be greatly enriched further by traveling - near and far; interaction with people of different cultures; different geographical areas; different occupations, different ways of life; different outlooks. Undoubtedly, many possibilities exist that are not often implemented even though they could make the teaching and learning process more effective and more beneficial by providing a variety of experiences and alternative strategies for adaptation to learners' characteristics.

## 7. STUDENTS LEARNING STYLES AND PREFERENCES

Wang (2008), defined learning styles as an individual's characteristics and preferred way of gathering, interpreting, organizing and thinking about information. In another perspective, learning strategies are regarded as any set of operations, plans or routines used by learners to facilitate the obtaining, retrieval, storage and use of information (Macaro, 2006). Learning styles are broadly described as cognitive, affective, and physiological traits that are relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe, 1979). Friedman and Alley (1984) suggested that teacher guidance can initially motivate students to identify and utilize their preferred learning styles and to take deliberate advantage of those preferences. If teachers can show students the variety and versatility of learning styles by providing experiences in different teaching styles, the resulting awareness and expansion of student learning styles may better allow students to meet the demands of academic teaching methods and assignments (Grasha, 1972).

Students' learning styles and preferences often affect the ways they approach any task and function under different conditions and learning environments. Learning styles such as reflectivity, impulsivity, field-dependence, field-independence, mental self-government, as well as preferences for interactive visual and auditory presentations of information have effects on students' academic performance. More recent research has demonstrated that young adult and adult learning styles are moderately strong habits rather than intractable biological attributes, and thus, can be modified and extended (Davidman, 1981). According to Schmeck (1981), context and task have been observed to influence the learning styles of native speakers of English; many individuals can change their strategies in response to the unique contextual demands of the instruction, context, and task. Shi (2011), in a study of the relationship between cognitive styles and learning strategies reported that cognitive styles have significant influence on learners' choices of learning strategies. Brown & Brailsford (2006), noted that cognitive styles is a psychological construct relating to how individuals process information while the learning strategies are specific actions taken by learners to make learning more efficient. However, learning strategies do not operate by themselves, but are rather linked directly to the learner's innate learning styles and other personality-related factors (Jie & Xiaoqing, 2006).

Some educators have begun to acknowledge the importance of adapting teaching strategies to students' different learning styles, but no earnest efforts have been devoted to this promising endeavor. The adaptation of teaching to learning styles may include not only differentiated teaching strategies but also dependability of the evaluation measures of what students have learned. Thus, the effectiveness of teaching and assessment of learning achievements can be enhanced by teachers' adaptation of instructional strategies to students learning styles.

## 8. IMPROVING LEARNING WITH EFFECTIVE LEARNING TECHNIQUES

Studies have shown that students are responsible for regulating and increasing the amount of their learning as they progress from elementary grades through middle school and high school to college and university. Lifelong learners also continue to regulate their own learning, whether it takes place in the context of postgraduate education, in workplace, and in the development of new hobbies or recreational activities (Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). Improving educational outcomes require efforts on many fronts, especially areas that involve helping students to better regulate their learning through the use of effective learning techniques. Some effective techniques are underutilized; probably because many of us do not pay attention to their potential to improve learning outcomes or we do not learn about them, and hence many students do not use them, despite evidence suggesting that the techniques could improve learning achievement with little added effort. One potential reason for the disconnect between research on the efficacy of learning techniques and their use in educational practice is that so many techniques are available and it is

quite challenging for educators to sift through the relevant research to decide which ones show promise of efficacy and could feasibly be implemented by students (Pressley, Goodchild, Fleet, Zajchowski, & Evans, 1989).

Careful observations in learning and studying revealed that the techniques outlined in the table have great potential for improving the meaningful learning outcome.

| Learning Technique | Basic principle |
|---|---|
| Elaborative interrogation | Generating an explanation for "why" and explicitly stated fact |
| Self-explanation | Explaining how new information is related to known information, or explaining steps taken during problem solving |
| Summarization | Writing summaries (of various lengths) of to-be-learned texts |
| Highlighting/underlining | Marking potentially important portions of to-be-learned materials while reading |
| Keyword mnemonic | Using keywords and mental imagination to associate verbal materials |
| Imagery for text | Attempting to form mental images of text materials while reading or listening |
| Rereading | Restudying text material again within reasonable time for emphasis after an initial reading |
| Practice testing | Self-testing or taking practice tests over to-be-learned material |
| Distributed practice | Implementing a schedule of practice that spreads out study activities over time |
| Interleaved practice | Implementing a schedule of practice that mixes different kinds of problems |

Source: Dunlosky et al., (2013)

It is worthy of note that domain knowledge may be required for students to use some of the learning techniques outlined above. For instance, the use of imagery while reading texts requires that students know the objects and ideas that the words refer to so that they can produce internal images of them. Students with some domain knowledge about a topic may also find it easier to use self-explanation and elaborative interrogation, which are two techniques that involve answering "why" questions about a particular concept. While some domain knowledge will benefit students as they begin learning some new concept, it is not a prerequisite for using most of the learning techniques. However, efforts to improve student retention of knowledge are essential for reaching instructional objectives. If one does not remember core ideas, facts, or concepts; applying them may prove difficult, if not impossible. Thus, as educators, we need to understand that "learning is better and more comprehensive if it is approached from the general principle rather than memorization of isolated concept or fact".

## 9. CONCLUSION

The present systems of education in most developing nations requires students to learn large amounts of information, identify what is important and how different ideas connect to one another and to the world outside classroom. It may be argued that these current educational systems, structures and practices are not sufficient to address and support the learning needs of all students in the 21st century. Therefore, realistic and sustainable change in the teaching-learning style is expedient. Undoubtedly, many possibilities exist that are not often implemented even though they could make the teaching and learning process more effective and more beneficial by providing a variety of experiences and alternative strategies adaptable to learners' characteristics. It is therefore necessary that new education policies should among other issues; explore the need to train teachers to adapt instruction to the diverse student abilities, learning styles, personality traits and needs.

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