

## FUNCTIONS AND ROLES OF SCAFFOLDING AND META-COMMUNICATION IN DISTANCE EDUCATION FOR DISTANCE LEARNING MATERIALS

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### Abstract

Up to the 21<sup>st</sup> century, the usage of Internet, Skype, Broadband, Facebook, Blogs, Wikis, Netiquette or iTunes was not as popular as nowadays. With also the recent digital development of Open Education Resources (OER) and Massive Open Online Courses (MOOCs), these emergences towards free and open resources and courses bring about potential democratization of distance education applications. This paper looks into the impact and the types of evidence that are generated across initiatives, organizations and individuals in order to make a summative analysis and give recommendations from the perspective of functional roles of scaffolding and meta-communicational within the digital learning environment.

Keywords: Digitalism movements and innovations, democratization in education, industrialization of education, OERs, MOOCs.

### Introduction

The changes in education of the 21st century as a result of the digital “tsunami” are huge. In the context of education, open and distance education (ODL) has become the watermark for recent and fast growing numbers of multimedia learning materials and applying digitalized materials in online platforms and practices in a variety of institutions and enterprises. Recall that in the year 2000, Internet broadband, Facebook or iTunes were not readily available, and they are now an integral part of our daily lives. Changes in technology will continue to accelerate at a greater speed; the shift to digital needs to be adaptive in par with the educational landscape. Open Education Resources (OER), Massive Open Online Courses (MOOCs), and, more recently, initiatives such as OERU, Coursera, Udacity, EdX are technology-enabled platforms that have a tremendous potential to democratize higher education. This means that developed technologies generate opportunities for the field of open and distance education. It confirms that information and communication technologies have produced an era of digital *tsunami* and are driving the restructuring of academia by forcing educators to re-align and re-design their academic work dramatically.

Especially, they are adapting their traditional course materials to the ODL system multimedia environments by using new technologies. The ODL, for instance, with the assistance of technologies has given access to any level of education to those who would otherwise have been unable to access education due to the lack of formal qualifications or the inability to combine traditional studies with work or personal family matters. Further, in the case of ODL, through the division of labor, specialization and the economies of scale created by media and advance technology, the access-quality-cost triangle ideology can actually be re-configured. As Kanwar (2012)

mentioned -- technological innovations can now be applied to widen access to content and resource materials to achieve economies of greater scale than several decades ago.

Thus, they are more active participants in the shift from broadcast to interactive learning than most of their faculty, subsequently, many of whom come from an era of entertainment, and education now may seem embarrassingly archaic. Today students prefer to discover than to be taught, to create a customized curriculum rather than accept one that is prescriptive in content, format and delivery. This approach, and variants of it at hundreds of institutions around the world, is being referred to as the *virtual campus* (it also gets labeled as distance ed, distal ed, distributive ed, digital ed, mediated ed, external ed, etc.).

In this technological age, while the training needs are growing like a snowball due to new skills needs, on the other hand we are increasingly served by free on-line educational materials coming on with an incredible speed. Two reasons dominate this change: the first and most important one is new learning trends; the second is wide spread technology use in daily life. Regarding the costs of sustainable educational online tools, instruments and trainings materials, technology developers and related stakeholders look for new ways and propose promptly new solutions to public, private institutions and to the business world. New solutions encourage learning tools and technologies to move to the cloud, to share as much as possible educational contents, products tools and services. However, at this step we are confronted with social, cultural linguistic, administrative and services related barriers. Technology based education became integrally a new industrial sector with its own lateral sub branch and financial resources, requiring meta solutions given the number of thousands of potential end users, development, management, hosting, certification, security and backup related costs (Demiray & Ozkan, 2012).

The digital technologies gave rise to many new providers of education and increased the competition in the academic globalized market; which is witnessing a growing trend of collaborations and convergence of academic practices enhanced by the new media. The growth of non-traditional ODL institutions, such as the distance education institutions, ODL universities, and free and commercial open online course companies has, especially in recent years, been on a continuous rise. The fact that these institutions have been able to develop courses produced on an industrial scale has made it possible to offer educational opportunities to a greater number at a lower or no cost.

What started with MIT's Open Course Ware (OCW) project has now been replicated to reach more countries in the world. A recent development of Massive Online Open Course (MOOC) or Massive Online Open Courses (xMOOCs) is known virtually by its open access of quality courses to anyone. In fact, it provides a way of connecting instructors and learners across a common topic or field of discourse and may prove to be one of the new digital technology innovations in our present time. Webley (2012) indicates that MOOC may be a silly-sounding acronym, but this new breed of open and free online classes has been heralded as revolutionary, and it is considered as the single most important event that will democratize any level of education and end the era of overpriced both traditional and open and distance education cost.

Here, distance education via information communication technologies (ICT), is the appropriate mean of reaching communities far away; also, creating relations with them

despite long distances and limitations of traditional methods of education is remarkable. It is then possible to be in contact with masses and share information, values and world views.

But many universities are not yet ready for this change – and governments have been slow to take the lead. While there are instances of innovation, the landscape is fragmented, various barriers prevent widespread uptake, and fully fledged institutional or national strategies for adopting new modes of learning and teaching are few and far between (Vassiliou, 2014, p. 4). So this is why, we need to study on steadily new reports on “Improving the quality of teaching and learning in higher education institutions,” which are adopted themselves for the modernization of higher education to set out recommendations on enhancing higher education through new technologies.

Internationalization is often confused with the term globalization. Altbach and Knight (2007) define *globalization* as the economic, political, and societal forces pushing 21<sup>st</sup> century higher education toward greater international involvement. Global capital has, for the first time, heavily invested in knowledge industries worldwide, including higher education and advanced training.

### **The Industrialisation of Distance Education**

Transforming existing organizations for an uncertain, competitive environment and for such innovative practices as eLearning requires a systemic approach that encompasses many organizational dimensions. It requires a vision of what higher education will look like in the future and a clear plan and methodology to transform the institution to achieve this vision. Moreover, the transition depends not only on the efficiency of the transformation process itself, but also on the commitment and entrepreneurial capacities of senior and middle managers and staff. This may be particularly difficult for the traditional single-mode university, more accustomed with face-to-face contexts and client groups within readily identifiable local catchments (Ulukan, 2005).

In an attempt to counterbalance this trend, NGOs have developed to emphasize humanitarian issues, developmental aid and sustainable development. According to eReadiness Rankings 2009, broadband and mobile connectivity levels continued to increase for almost all countries, notwithstanding the downturn. Some major findings from 2009’s up to now eReadiness analysis (Economist Intelligence Unit, 2009) are:

- Emerging markets continue to rack up the biggest advances in connectivity, or the extent to which people are connected to communication networks.
- Government ICT strategy in emerging markets is bearing fruit.
- ICT development may benefit from the recession.
- Policy concerns exist on the near and longer horizons.

eLearning with mobile learning is the long term method for learning’s future, not a niche part of educational development. It will become part of a mainstream of what educators will do for teaching and learners will do for learning. In Turkey, all classes in formal education are offered as face-to-face, and distance learning is almost nonexistent in the practice. Face-to-face learning, despite many positive aspects, is among the main reasons of the limited capacity. This may be overcome through conducting certain classes in formal education through e-learning (Demirci, Yamamoto & Demiray, 2011).

The consequences of these changes may also have bearing on the role of traditional institutions themselves. A fundamental question that will have to be considered, as put forward is whether the *digital age* opens new doors for open and distance learning/education in due course. If so, what are the functional roles of scaffolding and meta-communication concepts in this digital learning environments

### **Era of Digital in Distance Education**

During the last decade a perfect storm of capacity, distribution and need has created the conditions for exponential increase of free, accessible and open educational resources. This storm of free accessible and open educational resources is known as Open Educational Resources (OERs), and is started as a grassroots movement to make education available to everyone.

It all started when Massachusetts Institute of Technology (MIT) made its historic announcement to make its courses open and fully accessible, known as MIT OpenCourseWare Project in 2002. Over the next few years many other institutions followed MIT's lead (Matkin, 2013). The OER movement has then become an institutional movement in higher education communities. Other prestigious educational institutions, such as Harvard, Yale, Stanford, Carnegie Mellon, and U.C. Berkeley had made some of their educational content freely available online as well. According to the Global Industry Analysts the global market for eLearning will grow to reach \$52.6 billion by 2010. GIA stated that in 2007 only in USA the eLearning market was \$17 billions in 2007, and 30 billions 2020.

One of the most significant reasons is related to the cost of training. The literature is filled with reports about how much money companies saved by implementing e-learning. Increasing employee retention, rapid development, deployment and updating of courses, providing more effective training, availability of courses anywhere at any time are some of the other motives for corporations to invest in e-learning. Although there are quite impressive developments, eLearning in Turkey is still in its infancy stages (Aydin & Tasci, 2005).

Distance learning has become a major force by which individuals all over the world are acquiring the necessary training, skills, and education required to enter the job market. On the other hand, one of the major developments in the field of education in Africa 20<sup>th</sup> Century, apart from the taking over by Africans of the running of their education systems from departing colonialists, has been the relative growth of DE. To remain competitive, educational institutions are pressured to embrace DE.

Distance learning has changed dramatically since the 1990s as it has become a dominant part of the landscape of the higher education global industry of the 21<sup>st</sup> century. Today we have mega-distance learning corporations, colleges, and universities operating on all continents and offering training, continuing education, and academic degree programs in various fields. Open and distance learning/education opportunities respond effectively to the demands of individuals in the fast-paced globally competitive world of the 21<sup>st</sup> century. Consequently, programs are instituted without adequate consideration of stakeholder participations. To effectively accommodate new technologies, leaders must evaluate and address possible challenges. Faculty support has been identified as influencing DE effectiveness.

## **Functional Roles of Scaffolding and Meta-Communication for Knowledge Building in Digital Learning Environment**

### **Meta-Communication**

There are auditory means, such as speech, song, and tone of voice, and there are nonverbal means, such as body language, sign language, paralanguage, touch, eye contact, as well as writing. Communication is thus a process by which meaning is assigned and conveyed in an attempt to create a shared understanding.

Over time, technology has progressed and has created new forms and ideas about communication (<http://www.k12.wa.us/CurriculumInstruct/Communications/default.aspx>). These technological advances revolutionized the processes of communication. *Meta-communication* is the process between message designers when they are talking about the learning process, as distinguishable *substantive* learning out of their articulation. The hope is to increase the focus on the substantive knowledge, and understanding will be developed, by providing a separate channel for the support communication, and to do it in an easy, focused, and context aware manner (McLean, 1999).

Reported examples of meta-communication largely refer to particular utterances of the primary communication, often intertwined with the primary content of communication. Tanskanen, (2007) poses a number of examples where particular asynchronous textual utterances can even refer to themselves retrospectively, in the middle of the message, or prospectively. Yetim (2006), building upon Päivärinta (2001) and Ulrich (2001), discusses meta-communication as a means for discursive-ethical reflection on and elaboration of genres of (primary) communication. A *genre* of communication is a recurring communicative action within a community, which has a more or less shared purpose and form (Yates & Orlikowski, 1992). Tanskanen (2007) poses a number of examples where particular asynchronous textual utterances can even refer to themselves retrospectively, in the middle of the message, or prospectively. Meta-communication can refer also to the communication context in general, beyond particular primary utterances or genres. Hoppenbrouwers and Weigand (2000) give an example where norms for using e-mail in general as a medium were discussed. The idea of relational meta-communication (Wilmot, 1980) seems also to refer to the communication context and stakeholder relationships beyond particular utterances or genres.

### **Roles of Meta-Communication**

Education in the 21<sup>st</sup> century is based on the improvement of global and information focused skills. These skills are searching in the Internet, reaching information, collaborative learning, effective communication, critical thinking and creativity. The Internet has the feature of being widely used in education, and it is inevitable that this feature is becoming more important day by day. As distance learning evolves, so too does the value and excellence within online education. Within the online environment, more and more instructors are incorporating meta-communication models into their courses to create collaborative and supportive learning opportunities. Three meta-communications' means highlight influence high-quality teaching and effective student learning in a distance learning environment such as interactivity, social context, and communication technologies. According to research completed by Sloan-C: A Consortium of Institutions and Organizations Committed to Quality Online Education, more than one in four higher education students reported taking at least one class online (Perkins, 1991). The meta-communication model of interactivity, social context, and

appropriate communication technologies requires students' participation in reflective thought and applied analysis, which in turn must be communicated to peers and the instructor through dynamic participation. Students are therefore imposed to higher level thinking due to potential opportunities presented by other learners as well as the instructor to challenge their understanding through a meta-communication method. Interactivity is an important component to build into a distance learning course. Instructors create learning environments that encourage students to work in small and/or large groups through discussion and debate with the goal of sharing new knowledge and at the same time challenging existing knowledge schema or previous understanding. Instructors design opportunities for learners to think critically about topics and content by challenging peers and their own previous knowledge.

The social context of the meta-communication model is important as well. Interactivity is increased when learners are engaged in small and large group activities, which encourage them to be social. Within this social environment, learners again have the opportunity to test their understanding and to compare it with others' through the process of social negotiation. This allows learners to determine if they are accurate in their knowledge acquisition. The role of the instructor is that of a facilitator who guides the learner through direct and indirect questions (Perkins, 1991; Vygotsky 1978; Piaget, 1973; Bruner, 1966). The instructor ensures that all learners are challenged appropriately, the learning activities are structured to achieve relevant learning goals as well as are meaningful and applicable, and learners utilize appropriate communication technologies. This critical reflection and thought benefit the learner by providing cognitive dissonance, which allows learners to question their understanding and ultimately create a shared and coherent knowledge structure developed through collaborative interactions within the learning community (Sorensen et al., 2006).

The instructor takes on the important role of helping to provide learners with a sense of social presence within the course. Technology tools provide applications for announcements, discussion forums, and e-mail communication between the instructor and learner and between learners. However, it is still possible to perform an effective learning program via distance education. Anadolu University distance learning teaching staff proposes some methods and their outcomes for distance education. To achieve that, there are certain points which should be noted comprehensively as well. The first point to pay attention to is that while preparing a learning program an inter-instrumental structure should be used as a base. Each tool has different capacity regarding mind operation. While preparing learning and study materials, this should be taken into account and concept construction, different characteristics of different tools in language and visualization should be employed coordinately.

To that end, first of all the deficiencies of tools should be clarified. The gaps which are likely to emerge in the act of learning should be filled by making use of other tools. These deficiencies can be given as below:

- For the interaction through listening, lack of visual image.
- For the interaction through reading, the stability or mechanical immobility of visual image.
- For the interaction through seeing-listening, shift of attention to visual images or lack of abstraction.

- For interactivity, motivational lacks caused by spatial distance and meta-communicational deficiencies.

This reflective thinking requires learners to ask thoughtful and effective questions that are built upon their higher levels of domain knowledge and meta-cognitive skills developed through the course and collaborative design. When instructors develop the course, it is important to build in a peer-questioning scaffolding framework that will help facilitate the necessary meta-cognition and learning that will allow for the knowledge transfer in an online discussion, for example. This framework helps to create the meta-cognitive knowledge which is necessary for learners to begin generating meaningful interactions and develop higher order knowledge construction to work on complex problems surrounding the intended learning objectives. The ideal knowledge sharing culture is one where communication and coordination between groups is emphasized, where experts (e.g., teachers) share rather than guard their knowledge, and where knowledge construction is actively and visibly encouraged at all levels of the classroom through recognizing and rewarding knowledge sharing. Knowledge reconstruction can help to trigger a cognitive dissonance, or a gap, between a learner's beliefs and their experiences.

This conflict is necessary for constructing of knowledge at a higher level. The instructor builds on this conflict by asking probing questions and encouraging students to ask good questions of their classmates. This ultimately allows all students to build on their knowledge creation and overall understanding (Choi et al., 2005; Piaget, 1985). Eventually, through peer questioning and the multiple responses and perspectives to this same discussion by their peers, the learner recognizes differences within understanding and with guidance from the instructor recognizes the strength and weaknesses in their own response. This articulation of gaps of understanding through verbal discourse is the beginning of a learner's knowledge construction (Choi et al., 2005).

To sum up, the final point to consider is the role of individuality in the success of learning. Each receiver has a different mental structure which eventually determines the final success of education. For instance, for a person with high visual intelligence television or internet would be an effective channel while for a receiver with high verbal intelligence the opposite holds true. In order to prevent this, students enrolling in distance learning program should receive pre-tests and be offered different programs according to their intelligence types. The application of knowledge to the meta-communication process is strongly related to knowledge strategy encompasses knowledge management principles with operational goals and objectives; so that knowledge resources can be leveraged, in this case sense of direction obtained.

The overall use of a knowledge strategy can be seen as a dynamics chain of events to create, identify, collect, review, validate, share, adapt, and use knowledge. When these events are managed well, individual knowledge becomes community knowledge, which then turns to be class knowledge. As a result of this collaboration and validation, the course now has dynamics knowledge. Effectual knowledge educators are needed for leadership in 21st century schools.

As is emphasized in the text, meta-communication is a very important, powerful and functional concept during knowledge building for preparation of the course materials in education field. In this meaning, concept is becoming a more carefully designing course

for language learners. Good language learners are the ones who can understand and use meta communicative elements in communicating in English.

Some other supportive techniques and strategies may be developed as well. For instance, teachers may bring some videos to the class on which Indians, Africans and other people from different nationalities use as a study material, student will better understand the internationality and multiplicity of the ways in which these study materials are performed through different agents across cultures. Study producers may bring extra reading texts apart from the ones in their course book materials to familiarize students with other cultures and make them competent inter-culturally (Tomak, 2011). By doing so, students will also improve their intercultural competence by acquiring information about other cultures as well. In this experimental curriculum native speakers may be invited to enroll in the class or assist in the lessons. Teachers may create blogs or carry out online activities to support and develop students' critical thinking capacities. English textbooks and materials should be written that reflect other cultures and identities; so, the students can engage in relating the textbooks into their own cultural terms and expressing their identity rather than miming the others by gaining awareness of meta-communicative factors, actors and aspects of their targets (Istifci & Demiray, 2011). In conclusion, curriculum developers and material designers may discuss their educational course materials for re-building (at any level such as printed, audio, visual, electronic and verbal) from the point of function of meta-communication and knowledge building theory perspectives according to recent developments and learners' needs.

### **Scaffolding**

Significant use of scaffolding to organize and support the student investigation or inquiry, to keep students from straying too far off the path while seeking "the truth" about whatever issue, problem or question was driving the project. The least successful efforts assumed too much about student skills, organizational abilities and commitment. Young ones were sent off on expeditions with little in the way of structure or guidance. We should have learned by now that exploration by students' progresses most effectively when those students have been well equipped, well prepared and well guided along the path. Here, the focus is upon the scaffolding techniques that have proven especially worthwhile in an electronic context. (McKenzie, 1999).

*Educational (or instructional) scaffolding* is a teaching method that enables a student to solve a problem, carry out a task, or achieve a goal through a gradual shedding of outside assistance. It was first coined by researchers David Wood (Nottingham), Jerome S. Bruner (Oxford), and Gail Ross (Harvard) in their 1976 report, "The Role of Tutoring in Problem Solving." According to its original definition, scaffolding enlists the instructor as an whose role is to facilitate the student's incremental mastery of a concept. *Fading* is the process of gradually removing the scaffolding that was put into place for the student until he or she internalizes the information and becomes a self-regulated, independent learner (Pinantoan, 2013). Larkin (2002) suggested that teachers could employ the following effective techniques in scaffolding:

- First boost your students' confidence. To improve self-efficacy, begin by introducing students to tasks they can perform with little or no assistance. Provide enough assistance to allow students to achieve success quickly. This will help lower frustration levels and ensure that students remain motivated to



advance to the next step. This will also help guard against students giving up due to repeated failures.

- Second, help students “fit in.” Students may actually work harder if they feel as if they resemble their peers. Avoid boredom.
- Once a skill is learned, don’t overwork it. Look for clues that the learner is mastering the task. Scaffolding should be removed gradually and then removed completely when mastery of the task is achieved.

### **Characteristics of Educational Scaffolding**

Lange (2002) states that there are two major steps involved in instructional scaffolding:

- Development of instructional plans to lead the students from what they already know to a deep understanding of new material.
- Execution of the plans, wherein the instructor provides support to the students at every step of the learning process.

Five features describe scaffolding very clearly: intentionality, appropriateness, structure, collaboration and internalization.

McKenzie (1999) presented eight characteristics of scaffolding:

1. Scaffolding provides clear directions: Web-based research units offer step-by-step directions to explain just what students must do in order to meet the expectations for the learning activity. Instructional designers try to anticipate any problems or uncertainties, writing user-friendly directions in ways that minimize confusion, place a premium on clarity and speed students toward productive learning. The operating concept here is the “Teflon lesson,” a learning experience that has been well tested in advance so that anything that might go wrong is considered in advance and eliminated if possible. We don’t want our students wandering about like prospectors on the desert.
2. Scaffolding clarifies purpose: “Why are we doing this?” Scaffolding keeps purpose and motivation in the forefront. Rather than offering up one more empty school ritual like the status report, the scaffolded lesson aspires to meaning and worth. Built around essential questions, the scaffolding helps to keep the “big picture” centrally and in focus.
  - “We are looking at this question because it is central to being human.”
  - No “trivial pursuit” here.
  - Students are let in on the secret early. They are told why the problem, issue or decision is important, and they are urged to care about it. They do not lapse into simple collecting or gathering. They are not caught up in mindless activity traps.

Their work remains purposeful and planned. Each time they act, it is in service to the thought process, the discovery of meaning and the development of insight. Traditional school research placed too much emphasis upon collection, while scaffolding requires continuous sorting and sifting as part of a “puzzling” process --the combining of new information with previous understandings to construct new ones. Students are adding on, extending, refining and elaborating.

It is almost as if they are building a bridge from their preconceptions to a deeper, wiser, more astute view of whatever truth matters for the question or issue at hand.

3. Scaffolding keeps students on task: By providing a pathway or route for the learner, the scaffold lesson is somewhat like the guard rail of a mountain highway. The learner can exercise great personal discretion within parameters but is not in danger of "off road" stranding. Each time a student or team of students is asked to move along a path, the steps are outlined extensively. No need to wander, stray or stumble. Students may "take the curves" without fear of going over the edge. This is more than a matter of clear directions that could just as easily be printed out on paper.

The Web-based lesson provides structure and guidance coincident with each step of the journey. The progression of activities is liberating yet controlling at the same time. The student moves through something like a garden, taking each Web page like flag stones. There may be more than one path wandering through the garden, but none of them leads into the jungle or a swamp or a tiger pit.

4. Scaffolding offers assessment to clarify expectations: From the very start, scaffolded lessons provide examples of quality work done by others. Right from the beginning, students are shown rubrics and standards that define excellence. In traditional school research, students were often kept in the dark until the product was completed. Without clearly stated criteria, it was difficult to know what constituted quality work.

- Is it a matter of length? the number of sources cited?
- Does originality count?
- Does the logic and coherence of my argument matter?
- What constitutes adequate evidence?
- There are a dozen issues, all of which deserve attention and elaboration. As an example, consider the online rubrics for successful multimedia reports available at <http://www2.ncsu.edu/ncsu/cep/midlink/rub.multi.htm>

5. Scaffolding points students to worthy sources: Most educators complain that the Internet suffers from a low "signal to noise ratio" - the confusing, weak and unreliable information (noise) outweighs and threatens to drown out the information worthiest of consideration. Wary of wasting time, teachers have little tolerance for "data smog" and "info glut." They want to see students putting their energy into interpretation rather than wandering. Scaffolding identifies the best sources so that students speed to signal rather than noise.

Looking for the best websites on Columbus, Drake or Magellan to decide which would have been a better leader, the scaffolded lesson created by fifth grade teacher, Gretchen Offutt, identified 4-5 sites for each captain.

- Explorer Homeport
- <http://wwwsil.bham.wednet.edu/Curriculum/homeport.htm>
- Knowing that the Web is filled with sites not worth visiting because of quality, bias or reading level concerns, the teacher visits 100+ sites per captain before winnowing the list down to 4 or 5 per captain

- Does this mean the student has no options? It depends upon the teacher. And it depends upon the school.

In some cases, students must stick to the sources pre-selected by the teacher. In other cases, the student may use these sites as a starting point, extending further out into Cyberspace in search of something unusual. The scaffolding serves as an introduction, not as a corral.

6. Scaffolding reduces uncertainty, surprise and disappointment: The operating design concept for scaffolded lessons is the "Teflon lesson" - no stick, no burn and no trouble. Lesson designers are expected to test each and every step in the lesson to see what might possibly go wrong. The idea is to eliminate distracting frustrations to the extent this is possible. The goal is to maximize learning and efficiency. Once the lesson is ready for trial with students, the lesson is refined at least one more time based on the new insights gained by watching students actually try the activities.
7. Scaffolding delivers efficiency:
  - If done well, a scaffolded lesson should nearly scream with efficiency. Teachers and students should shake their heads in disbelief.
  - "It felt like we completed ten hours of work in just two!"
  - "How did we get so much done?"
  - This perception is achieved, in part, by virtue of comparison with the old kind of school research that was mostly about wandering and scooping. Boredom fed by irrelevance slowed the passage of time. It took forever to get the job done.
  - Scaffolded lessons still require hard work, but the work is so well centered on the inquiry that it seems like a potter and wheel. Little waste or wobbling. Scaffolding "distills" the work effort. Focus. Clarity. Time on task. The student is channeled. No mud flats, shoals or other navigational hazards.
8. Scaffolding creates momentum: In contrast to traditional research experiences, throughout which much of the energy was dispersed and dissipated during the wandering phases, the channeling achieved through scaffolding concentrates and directs energy in ways that actually build into momentum. It is almost like an avalanche of thoughts, accumulating insight and understanding. "Students in resonance," the work gathers speed. The drive toward meaning is accelerated. The essential question and its subsidiary questions create suction, drive, urgency and motivation. The search for understanding inspires and provokes. One loses sleep. One awakens in the middle of the night, wondering, pondering, considering.

### **Roles of Scaffolding**

*Instructional scaffolding* or simply known as *scaffolding* in education is defined as a guidance or support from teachers, instructors or other knowledgeable persons that facilitate students to achieve their goals in learning.

Scaffolding means providing students with instructions during the early stage of learning before shifting the responsibility to them in the process of developing their own understanding and skills. Since scaffolding is a kind of support or assistance to

learners with “just-in-time,” “just enough,” “just-for-me,” “just-in-case” approaches, it has usually been used in face-to-face education until recently. In distance learning environments *learner support* strategies are used (Kesim & Ozan, 2010).

Scaffolding is the concept that is commonly related to the socio-cultural perspective on teaching and learning. This concept was introduced by Wood, Bruner, and Ross (1976), in which scaffolding was defined as the tutorial assistance an adult provided for a child for learning that is beyond the child’s capabilities. The aim of scaffolding is to build the child’s or learner’s knowledge in order that he or she is able to complete a task, and complete the same task without assistance in the future. The mother or the teacher takes responsibilities for controlling the elements which are initially beyond the child’s or learner’s capacity (Wood, Bruner & Ross, 1976). Similarly, Vygotsky (1978) suggests that learners should be guided or scaffolded by a more capable peer to carry out a task. Ge and Land (2003) pinpoint that these notions of scaffolding emphasize the role of dialogue and social interaction (Patcharee-Scheb-Buenner, 2013).

Currently, the form of instructions that emerge between teachers and students is mediated through technology, and the learning communities exist in the online settings. Thus, it is important to acknowledge the suitable form of support required for the students, especially in an online learning environment (Jumaat & Tasir, 2014). A teacher who encourages freedom of learning and is open to it can accelerate the transition of learning from being teacher-centric to student centric. According to Roger Hiemstra, a scholar of adult learning and self-directed learning, a teacher plays six roles in self-directed learning – she is content resource, resource locator, interest stimulator, positive attitude generator, creativity and critical thinking stimulator, and evaluation stimulator.

How the six roles are played eventually depends on the social setup, the attitude of the student and the willingness and enthusiasm of the teacher to engage in promoting self-learning among her students (see: *Self-directed Learning in the Digital Age*, 23 Apr 2016 <http://content.mobicip.com/content/self-directed-learning-digital-age>).

For example, in one of the vocabulary activities, after completing the exercise following the textbook, the teacher extended it by asking the students to think more about vocabulary in their real life situations. This is described as contingent scaffolding because the teacher felt that his students might need to acquire more vocabulary knowledge. However, there were evidences to show teachers not providing contextual support when dealing with a reading comprehension. Having analyzed the scaffolding patterns in both types of activities, it is apparent that the features identified in the teachers’ and students’ interaction reflect Wood, Bruner and Ross’s (1976) frameworks. The interaction can be viewed based on the two frameworks since they conceptually align with each other. For example, reducing or simplifying a task makes a problem easier for learners. An easier problem or task may come down to the actual competence level of the learners. This scaffolding also concerns human interpersonal relationships since it describes one of the scaffolding features in “frustration control.” Teachers who can identify that frustration may be able to help the students at the critical moment effectively. The last feature of Wood, Bruner and Ross (1976) functions exhibits ultimate help which reveals a maximum or the highest degree of help.

In addition, Wood, Bruner and Ross (1976) also mention this scaffolding in terms of temporary support and gradual withdrawal when learners become independent (Patcharee-Scheb-Buener, 2013).

Digital self-directed learners are typically those who are tech-savvy and aware of their responsibility in making learning meaningful. They are motivated and persistent, independent, self-disciplined and goal-oriented. However, the effectiveness of self-directed learning depends as much on the availability of knowledge as on the attitude of the learner. The advent of the Internet has breathed new life into self-directed learning, given the extensive knowledge and support available online, which transcends geographic barriers. Online learning opportunities, pedagogical shifts and easy accessibility of Internet through multiple devices offer attractive opportunities for learners to assume greater responsibility and initiative in their own learning. While the Internet is a veritable source of all information, if not knowledge, lack of control mechanism and checkpoints makes it tricky to navigate the stormy ocean of information. Thus, individual skills in deciding upon the validity and reliability of information become essential, but this needs practice and time to develop. Scaffolding involves assisting students initially, with slow withdrawal as their competence increases. While teachers are the primary scaffolds in traditional face-to-face learning environments, online learning environments, by their limits on face-to-face interaction, open up new definitions, opportunities and protocols for scaffolding.

Teacher's scaffolding approaches in the digital era include providing resources and activities that present questions for critical thinking and providing procedural guidance on how to access information online. These approaches are best mediated through the use of web-based or app-based tools that can creatively combine a range of learning technologies. Thus, teachers can use modern telecommunication technologies including instant messaging and blogging to provide consistent guidance and obtain timely feedback on student engagement and motivation and to promote interaction and collaborative learning. For example, according to a study on students' opinions on self-directed learning, social media should be extensively used to achieve a better knowledge management system whether it is a purpose directed to peer to peer, student and supervisor, or student and mentor. It is vital that educators to be trained to recognize and nurture self-directed learning by using technology and being capable of creating learning environments that support it. A teacher who encourages freedom of learning and is open to it can accelerate the transition of learning from being teacher-centric to student centric. How the six roles are played eventually depends on the social setup, the attitude of the student and the willingness and enthusiasm of the teacher to engage in promoting self-learning among her students. (Source: Self-directed Learning in the Digital Age, 23 Apr 2015 <http://content.mobicip.com/content/self-directed-learning-digital-age>)

### **Conclusion**

In a summary and conclusion, the use of scaffolding in learning contexts incorporates technologically based novel problems. Even in computer extended contexts, the conceptualizations of scaffolding are needed in order to gain greater insights into teaching and learning processes. This paper brings discussions and provides additional support that cognitive, affective and technical scaffolding and meta-communication have benefits for learning, and in this case students are able to support each other's learning via sharing strategies and articulating the reasons behind them to each other in

the digital age and digital learning environment. In the other words, this paper looks into the impact and the types of evidence that are being generated across initiatives, organizations and individuals in order to make a summative analysis and recommendations from the point of functional roles of scaffolding and meta-communication perspectives within the digital learning environment aspect. Finally, this paper hopes to provide some insight into the dynamics of the digital age that is a revolution as a *tsunami* that affects present applied open and distance education systems.

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