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Teaching Aspects of E-Learning

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E-Learning is a new form of pedagogy for learning in the 21st century. E-Teachers are e-Learning instructional designers, facilitators of interaction, and subject matter experts. The roles of e-Teachers are to enhance learners' cognitive engagement and interaction. This is achieved by using the benefits of computer mediated communication- greater accessibility and adaptability. This article overviewed sociocultural theory, transactional distance, and computer mediated communication, which support the uniqueness of teaching aspects of e-Learning. Instructional contents, assessment strategies, and digital libraries are discussed as unique elements of e-Teaching. All the stakeholders of e-Learning should make efforts to close transactional distance and increase verbal immediacy.

A validation study indicated that e-Learning has three dimensions; dimensions of accessibility, adaptability, and clarity of communication (Seok, 2006). These dimensions address that the two major aspects of e-Learning are cognitive and teaching aspects (Seok). Some of the items addressing the teaching aspect in the validation study are as follows:

The instructor provides:

- discussion opportunities related to the course content,
- instructional goals, strategies, and evaluation that are aligned to state/national standards when appropriate,
- access to accurate and relevant content,
- students a detailed syllabus,
- students benchmarks for completing course requirements on time,
- individual responses to student work, and
- feedback on exams and assignments that are timely and constructive.

The instructor:

- assists in the process of students reviewing their work,
- informs students on how to communicate with the instructor,
- aligns content with the knowledge and skills assessed,
- enhances communications between students and the instructor,
- effectively manages student email,
- informs students about the level of self-discipline required to successfully complete the course,
- presents clear and understandable performance expectations,
- includes meaningful examples that help students understand what is expected in the course,
- uses learning objectives that are consistent with the stated purpose of the course,
- engages students in activities aligned with content,
- presents advanced organizers or previews for each lesson as a study tool,
- maintains archives of student work following completion of the course,
- insures a balance of knowledge presentation, applied experiences and practice opportunities,
- aligns course performance expectations with goals and objectives,
- accommodates cultural differences between the learner and the instructor,
- involves learning activities that require student collaboration,
- has instruction that adequately covers the critical topics for the content,
- communicates the role of the instructor,
- allows students to easily communicate with other students,
- encourages communications with the instructor,
- enhances collaboration among students,
- directs students to additional resources for enrichment,
- promotes socialization of a learning community, and
- involves learning activities that require student collaboration.

E-Learning is defined as internet-based learning in which educational actions and functions delivered by the Internet are organized systematically as part of an educational program (Harris, 1999). In this research, e-Learning means all internet-based learning experience and it includes internet-based curriculum and online courses. In this educational system, the majority of interactions between (a) the instructor and learners, (b) the learners and learners, (c) the individuals and groups, and (d) the groups and individ-

ual occur without limitations of time and place when they are not in the same place, producing the educational purposes and results (Nuttall, 2002).

As can be seen from these items, the e-Teacher is expected to act as a facilitator who accommodates cultural differences in the e-Learning environment and provides learning activities that require student collaboration and cognitive engagement. The e-Teacher's ability to include effective communication, higher cognitive and social interactions, and other student to student or student to teacher collaborations is one the cornerstones of accessibility and adaptability of learning experiences. Why are collaboration, communication, interaction and social and cultural accommodation important in the learning experience?

Vygotsky's (1978, 1986) sociocultural theory emphasized that learning and the mind's development was consciously and unconsciously constructed from social interactions and language in the cultural context. Vygotsky's sociocultural theory emphasized "the interaction of interpersonal (social), cultural-historical, and individual factors as the keys to human development" (Schunk, 2004, p. 294; Tudge & Scrimsher, 2003). Language, activity, and culture are the key concepts of his theory (Eggen & Kauchak, 2006).

The communication of e-Learning is mainly composed of the text-based, written language, for example: hyper-text, email, and bulletin board. Language is essential to Vygotsky's theory and e-Learning. First, language is "a means of communication" (Vygotsky, 1978, p. 89) with which eLearners and e-Teachers are able to access and adapt the information shared by the participants of the knowledge community. Second, the text-based language is a tool of the mind with which eLearners can think as well as solve problems and it provides the framework for the thinking process.

A couple of items emphasize the e-Teacher's ability to engage students in activities aligned with content and to involve learning activities that require student collaboration. Vygotsky (1978) emphasized the importance of the learner's meaningful interpersonal interaction using the authentic, cultural, and social activities especially "the use of concrete, look-and-do methods" (p. 86).

One of these items addresses cultural accommodations between the leaner and the instructor. The cultural feature of Vygotsky's (1978) sociocultural theory stresses learning form the social context. The manner that learners interact with their environment using symbols, language, cultural objects, and writing with peers, e-Teachers, learning objects, and contents – changes into their cognition. The higher interaction and collaboration of e-Learning enhances language uses and authentic activities that help to create the zone of proximal development, which is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, p. 86).

E-Teachers' Role

Online instruction is not a delivery system (Meyen, Aust, Bui, Ramp, & Smith, 2002) but "a new form of pedagogy" (Smith & Meyen, 2003, p. 1) improving the quality of teaching (Meyen, Aust, Bui, Ramp, et al). "Pedagogy includes teaching methods related to the presentation of experiences, engagement of learners, reinforcement, motivation, organization of teaching tasks, feedback, evolution, and curriculum integration" (Meyen, Aust, Gauch, et al., 2002, p. 40).

Based on these items the e-Teachers' main roles are categorized into four types of e-Learning pedagogies:

1. Instructional designers: They develop, maintain, implement, support, and update "the course content, e-learning activities, and assessment framework" (Anderson, 2004, p. 276; Garrison & Bayton, 1987; Prensky, 2000).
2. Facilitators of discourses: e-Teachers facilitate students' perceptions of the values found in different learning communities, such as trust and safety. e-Teachers contrive ways to support individual learners as well as build and maintain their learning communities (Anderson).
3. Subject matter experts: e-Teachers should be subject matter experts and be able to convey knowledge effectively to learners. e-Teachers are to provide academic motivation and intellectual curiosity. e-Teacher should be knowledgeable on the process of e-Learning and its pedagogy (Anderson).
4. Technicians: e-Teacher should have knowledge of the mechanisms of infrastructure, navigational skills and "Internet efficacy" (Anderson, 2004).

Additionally, in collaborative learning models, "Teachers also prepare students for project work by instructing them on how to organize information, define roles, plan timelines, and work cooperatively with peers on routine assignments" (Meyen, 1998, p. 1). Anderson (2004) described the integrity of an e-Teacher's character as the "intellectual and scholarly" leader (p. 287). Salmon (2000) employed "e-Moderator" (p. 26, 41) to describe the e-Teacher's assigned, expected, social responsibility and behavior. The e-Moderator is a facilitator of e-Learning, especially in the collaborative learning environment at the postsecondary educational level. According to the author, the e-Moderator should be at least as knowledgeable or informative on the subject matter purported to be achieved in the learning community. The e-Moderator is effectively capable of the following:

- Providing information about technical skills, including navigating web resources, accessing e-Learning materials, managing and controlling

learning software and infrastructure used for the course.

- Building knowledgeable communities by socializing individuals through motivating their active virtual attendance, access to each other, and sharing of information (Salmon).

E-Learning Content

"Instructional designers can build small (relative to the size of an entire course) instructional components that can be reused a number of times in different learning contexts. Additionally, learning objects are generally understood to be digital entities deliverable over the Internet, meaning that any number of people can access and use them simultaneously" (Wiley, 2000, p. 3). e-Learning is defined as educational material (Carliner, 1999), which facilitates the sharing of learning materials and resources. That is the power of electronic delivery of instructional material. Harris (1999) defined the content of e-Learning as "the information, exercise, tests, or other material that the instructor creates in order to create a learning situation" (p. 141).

Moallem (2003) categorized computer mediated interactions into two types: (a) cognitive or individual interaction, and (b) social or interpersonal interaction. Cognitive or individual interaction refers to the learner's interaction with content. The structure of the e-Learning environment determines the magnitude of all interactions of the e-Learning experience. The learning content determines the learning activities and the type of interactions. Therefore, the subject matter experts who prepare the content are able to integrate this information into the structure in order to produce effective e-Learning (Trentin, 2001).

A quality learning experience will not happen without appropriate learning content. The technology is merely a delivery medium of the e-Learning experience, which means the effective instructional design facilitates students' learning (Ally, 2004; Anderson, 2004; Clark, 2001). The content must be effectively designed and be implemented to the appropriate "delivery mechanism" in order to meet the learners' educational needs (Harris, 1999, p. 149). Harris asserted that e-Learning has eight modes of delivery: (a) email, (b) listserv, (c) bulletin board, (d) static web pages, (e) interactive web pages, (f) chat, (g) video conference, or (h) a combination. The e-Learning provides the enriched learning through the modes.

Many researchers provided the elements of effective learning contents. They are as follows:

- Problem-solving skills and higher order thinking (Anderson, 2004; Fahy, 2004; MacKnight, 2001; McPeck, 1990; Trentin, 2001).
- Cultural approach using the language and cultural norms of the learning community (Anderson; McPeck; Sherry, 2001).

- Learner centered elements facilitating learners' own autonomy with which learners can transfer and apply their learning into new contexts and knowledge with the thinking skills (Anderson).
- Assessment centered elements providing timely appropriate feedback and assessments of students' learning outcomes (Ally, 2004).

Digital Library

As discussed previously, the main characteristic of e-Learning is easy universal access to educational courses, learning materials, and resources (Carliner, 1999; Moallem, 2003). A digital library is an electronic information space that includes all learning materials as well universal access to all forms of information services, including digital modes. It purports to facilitate collaboration among people from all different fields, such as, (a) business, (b) politics, (c) education, and (d) research, and it contributes to lifelong learning experiences (Association of Research Libraries, 1995).

Traditional libraries have focused on holdings, while effective ways to deliver learning materials have not been provided. However, the Internet has changed the delivery modes of learning materials, and the digital library has been focused on "access" (Hughes, 2004, p. 376). Greenstein (2000) defined a digital library service as a "networked online information space in which users can discover, locate, acquire access to and, increasingly, use information" (p. 290). The digital library supports different perspectives from various cultures and strengthens its multiple functions, including providing "lifelong innovative, scholastic research and lifelong learning. It is designed for the library's patrons as well as for its professional staff and with an eye on the needs and capacities of those who supply it with information content" (Greenstein, pp. 290-291). Matson and Bonski (1997) demonstrated some characteristics of the digital library. They included (a) computer technology related data collection, (b) a standardized part of "the emerging national information infrastructure" (¶ 5), (c) "information products" from "online database" (¶ 5), and (d) electronic "library systems" (¶ 5).

Many digital library projects declare that the digital library has improved quality of learning and assisted in obtaining the learning goals. For example, the University of Michigan Digital Library Project created in 1994, has implemented the open redistribution of information through the Web. The project also indicated that it increased the opportunities for inquiry learning (Digital Library of the University of Michigan, 2005). The digital library represents better gains in students' learning and contributes to the development of learners' scientific thinking (Borgman et al., 2000).

The digital library is the transformation of the traditional library, which includes broader and more integrated information, perspectives and benefits to more diverse users (Hughes, 2004). Borgman et al.(2000) asserted that the

digital library should meet users' needs in terms of information processing, including collecting, systematizing, and examining knowledge and information. It also should be able to deal with questions from the users. Hughes also posited that the digital library should:

- be easily found among other institutional web pages;
- provide an up-front tutorial for the new leaner;
- be integrated with the institution's online courses;
- provide tools to assist with online searches; and
- provide access to personal assistance, if needed (p. 376).

Assessment

The e-Learning environment creates unique learning experiences. It has cognitive, social, and teaching aspects that have significantly different modes from the traditional social aspects since they are delivered through the use of technology. e-Learning provides more "opportunities" of authentic assessments (Meyen, Aust, Bui, & Isaacson, 2002; McLoughlin & Luca, 2002). Technology makes the authentic assessment possible: "technology offers a total environment where team work, collaboration, and communication skills can be assessed by giving learners multiple channels of expression, such as visualization and multimedia" (McLoughlin & Luca, 2002, p. 419). The e-Learning instructor (e-Teacher) as the instructional designer, plans, designs, and integrates e-Learning curriculum into the Web before the learning experience is implemented. Therefore, the instructor (e-Teacher) (a) researches, (b) examines, (c) analyzes, and (d) reviews the content and what should be assessed to meet the learning goals and outcomes. These processes enhance the validity of the assessment in e-Learning environments. Therefore, technology enhances the "efficacy" of assessment and the quality of the learning experience (Meyen, Aust, Gauch, et al., 2002, p. 40; McLoughlin & Luca; Wiggins, 1998).

The process of assessment is essential in curriculum development since it provides information about learners' learning outcomes and their progress. It also allows the instructor to predict the learner's academic progress, future learning, and revise the learning experience to meet the learners' needs (Demaray & Elliot, 1998; Meyen, Aust, Gauch, et al., 2002; Overton, 2003). Technology, as an instructional tool, supports (a) curriculum and learning experience (Reed & McNergney, 2000) and (b) provides "communication tools, databases, and asynchronous network" (McLoughlin & Luca, 2002, p. 421). Therefore, technology implemented learning environments need the assessment approach, which is applicable to the e-Learning curriculum and instruction strategies.

Many researchers advocate the authentic performance assessments in constructivist learning (Elliott, 1995; Jones, Valdez, Nowakowski, & Ras-

mussen, 1995; McLoughlin & Oliver, 1998; Shaffer & Resnick, 1999; Wiggins, 1998). Constructivism regards education as interactions between (a) learner and learners, (b) learners and content, and (c) learners and instructors in the learner-centered environments. Therefore, e-Learning assessment refers to assessing eLearners interaction with content, other learners, and the instructor (Hawkes & Terry, 2003; Wagner, 2001). e-Teachers measure the abilities of "communication, analysis, synthesis and construction of new knowledge and making of meaning," team work, participation in, and contribution to the learning experience. Therefore, "higher order skills, critical thinking, creativity, and problem-solving skills should be assessed" (Juwah, 2003, ¶ 7, 21; Miller & Lu, 2002).

Feedback, peer assessment, self-assessment, and performance assessment are recommended as the essential elements of a good assessment of the e-Learning context (Anderson, 2004; Berge, Collins, & Dougherty, 2000; Biggs & Moore, 1993; McLoughlin & Luca, 2002; Meyen, Aust, Gauch, et al., 2002; Morgan & O'Reilly, 1999; Innovations in Distance Education, 1998). Reeves (2000) recommended Angelo and Cross's (1997) assumptions as the guideline for e-Teachers' training in assessment, although they were developed in the traditional learning context. They are:

- The quality of student learning is directly, although not exclusively, related to the quality of teaching. Therefore, one of the most promising ways to improve learning is to improve teaching.
- To improve the effectiveness, teachers need first make their goals and objectives explicit and then get specific, comprehensive feedback on the extent to which they are achieving those goals and objectives.
- To improve their learning, students need to receive appropriate and focused feedback early and often; they also need to learn how to assess their own learning.
- The type of assessment most likely to improve teaching and learning is that conducted by faculty to answer questions they themselves have formulated in response to issues or problems in their own teaching.
- Systematic inquiry and intellectual challenge are powerful sources of motivation, growth, and renewal for college teachers, and classroom assessment can provide such challenge.
- By collaborating with colleagues and actively involving students in classroom assessment efforts, faculty enhances learning and personal satisfaction (pp. 7-14; Reeves, 2000, pp. 104-105).

Transactional Distance

The transactional distance theory explains the degree of distance between an e-Teacher and the eLearners as well as provides a relation between struc-

ture, dialogue, and autonomy. Transactional distance was defined as: "…..a psychological space of potential misunderstandings between the behaviors of instructors and those of the leaners, and this is the transactional distance" (Moore & Kearsley, 1996, p. 200).

In an e-Learning environment, the higher the structure and the lower the dialogue, then the greater the distance between instructor and learners, illustrated in Figure 1.

The highly structured program allows little or no dialogue and the learners should exert more responsibility, autonomy, and input in order to gain product and vice versa (Moore, 1991, 1993; Moore & Kearsley, 1996). Kanuka, Collett, and Caswell (2002) asserted that the "appropriateness" in transactional distance theory meant (a) an increased opportunity for the quality dialogue, (b) an instructional structure that met learners' educational needs, and (c) the learners' capability to exert their own autonomy over the learning experience. Therefore, successful distance education is determined by the degree of (a) the appropriate amount of opportunity for the quality dialogue between teacher and learner; (b) appropriate structure, which provides well organized learning materials; and (c) learner's well motivated autonomy in the appropriate structure (Moore, 1991, 1993; Moore & Kearsley). Researchers empirically explored transactional distance to examine the distance between teachers and learners. The researchers employed different mediums, which resulted in supportive or neutral outcomes to Moore's transactional distance theory (Stein, Wanstreet, Calvin, & Overtoom, 2005; Stirling, 1997), illustrated in Table 1. Moore (1993) suggested teleconference programs for the lower structure medium and television programs for the higher structure medium.

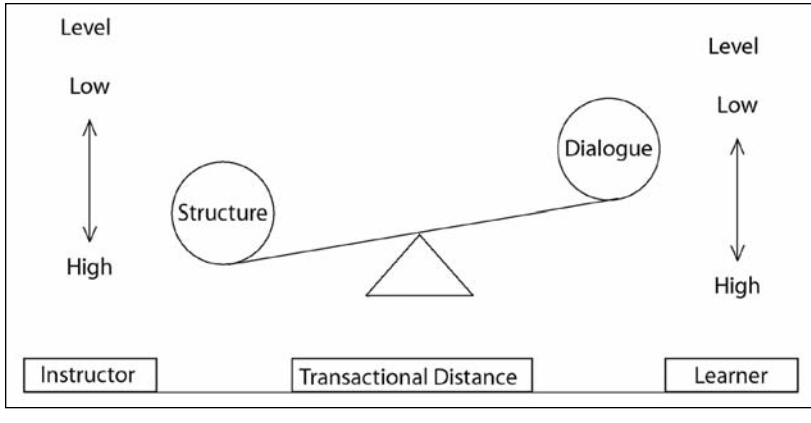

Figure 1. Transactional distance

Table 1
Research Supportive to Transactional Distance Theory

Authors and Date	Medium	Structure	Results (supportive or neutral to Moore's theory)
Moore, 1993	Teleconference	Lower	
Moore, 1993	Television	Higher	
Bischoff, Bisconer, Kooker, & Woods, 1996.	Electronic mail	Lower	Very supportive
Chen & Willits, 1998.	Video conference	Lower	Very supportive between learners. Partially supportive between learner and instructor based on learning outcomes
Saba & Shearer, 1994	Video conference	Lower	Very supportive

As Table 1 outlines, Chen and Willits' (1998) research examining 121 learners' videoconference experiences indicated that the dialogue between learners positively influenced students' outcome. However, the study results indicated that as far as the learners' outcome was concerned – how much learners gained knowledge of the subject matter – the distance between the instructor and the learners was only partly supported. Therefore, the e-Learning environment has greater complexity in terms of the interactions among learner, content, infrastructure, and interface. This is illustrated in Figure 2. Figure 2 was drawn based on the principle of transactional distance and typology interaction in distance learning environments (Chen, 2001).

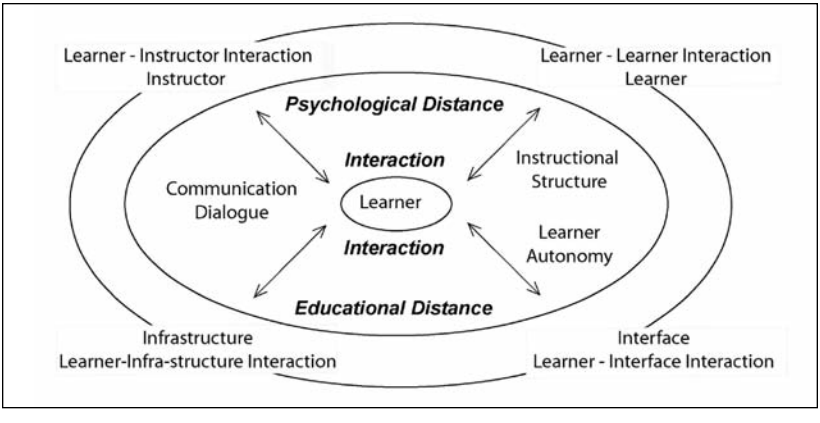

Figure 2. Interactions and the distance of e-Learning environments

Computer Mediated Communication

The e-Teacher's main role is to facilitate communication and enhance interactions and collaborations in the e-Learning environment. The new challenge and responsibilities assigned to e-Teachers are the selection of communication strategies to decrease psychological distance between learners and between learners and teachers.

Researchers suggested that Computer mediated communication is an effective educational strategy to facilitate cooperative or collaborative learning (Levin, Riel, Myake, & Cohen, 1987), which e-Teachers can implement into their e-Learning interactions and collaborations. "In general, computer-mediated communications (CMC) are described as communications, mediated by interconnected computers, between individuals or groups separated in space and/or time. Common characteristics of CMC include: asynchronous and synchronous communication capacity, high interactivity, and multiway communication" (Luppicini, 2007, p. 142). Adams, Carlson, and Hamm (1990) argued that the computer mediated communication strategies using electronic mail (emails), computer conferencing, and electronic bulletin boards, fax, and voice-mail enhanced text-based discussions, interactions, and collaboration.

Holden and Wedman's (1993) research indicated that the advantages of CMC, specifically emailing, were

- distribution of class materials,
- high rates of email correspondence between students and the instructor,
- sending and receiving assignments,
- collaboration of the student work,
- using file management tool,
- network access: 24–hour free, toll-free from dorms, offices, classrooms, and
- wide spread online library database searches to facilitate student learning.

Computer conferencing is another preferable teaching strategy of CMC to enhance learners' participation. Jonassen and Kwon's (2001) study indicated that the computer-mediated communication approach is to construct more focused, on-task, and purposive communication and enhance problem solving.

Communicational Immediacy

Communication through the Internet is an essential means of e-Learning, since the technology applied to the Internet contributes to the interactive and collaborative e-Learning community (Smith & Meyen, 2003). Internet-based communication combined with immediacy increases the sense of community, by fostering trust, interdependence, student satisfaction (Paloff

& Pratt, 1999), and a sense of community (McMillan & Chavis, 1986). The quality of communication is an essential component of e-Learning, which enhances the sense of community. e-Teachers supported and stimulated learners to be active participants through "instructor immediacy – a feeling of relational, emotional, and psychological closeness- and deemed this important factor in online courses" (Baker, 2003, ¶ 1).

Communication has two types of immediacy that can be described as verbal and nonverbal (Baker, 2003; Mehrabian, 1971). Nonverbal immediacy includes physical behavior, such as (a) position of the body, (b) physical expressions, (c) emotional closeness, and (d) the manner of expression in the voice (Andersen, 1978, 1979; Christophel, 1990; Mehrabian, 1969). Perception of verbal immediacy is generated by specific behaviors; "calling a person by his or her first name, asking questions, using reassuring words, relating things to the person, and affirming them in their response" (Baker, ¶ 3). Most communications between eLearners and e-Teachers is textual, mainly conveyed through emails and online discussions, which makes verbal immediacy the type most commonly employed in e-Learning (Baker).

Based on his experimental research, Baker (2003) asserted that the e-Teacher's role was critical in facilitating all types of interactions. e-Teachers apply verbal immediacy as their main communication strategy and infuse it into their interaction with learners. They provided feedback and interpersonal caring through praise, details, and through inclusive pronouns used in the present tense and presented in a self-disclosing manner (Jordan, 1989; Gorham, 1988; Wiener & Mehrabian, 1968; Jensen, 1994; Ni, 2004). Therefore, the immediacy of elearner and e-Teacher interaction is to be used in conjunction with the cognitive and affective instructional strategies of (a) reinforcement, (b) self-disclosures and recognition between learner and instructor, and (c) intimacy (Arbaugh, 2001; Baker, 2001, 2003; LaRose & Whitten, 2000; McAlister, 2001; Ni, 2004).

CONCLUSION

There have been teachers throughout world history. The needs of the society have been changed, and it structures the mode of education based on its needs. The teachers' role has been changed accordingly. e-Teachers are facilitators of learning with the medium of computer technology in the modern age. In the growth of distance education, the stakeholders of distance education should make efforts to close the transactional distance between e-Teachers and eLearners using verbal and nonverbal immediacy, effective assessment, and informative system to have better learning outcomes.

Educational experiences in e-Learning are similar to those of traditional learning; the design of contents, assessments, and learning materials. The computer based Internet mediated pedagogy makes eTeaching very unique.

As discussed, computer mediated communication, sociocultural, and transactional theories stress the interactions between participants of the knowledge community.

From those theoretical perspectives, e-Teachers are regarded as the facilitators of the interaction and collaboration in the social, cultural context. e-Teachers also need to be aware of the content of the subject as the digital society needs workers who can work with information changing in the blink of an eye.

The uniqueness of e-Learning is higher accessibility and adaptability. e-Teachering enhances the accessibility and adaptability by using clarity of socially and culturally adapted communication and computer mediated communication. Another unique aspect of eTeaching is that the teaching materials can be reused easily as well as used simultaneously by many due to the electronic copies of them.

In summary, e-Teachers' roles in the process of e-Teaching are using computer mediated communication to enhance accessibility, adaptability, and cognitive engagement. e-Teaching involves (a) designing instruction and course content, (b) organizing teaching materials, (c) implementing collaboration and interactions, and (d) direct content teaching (Anderson, 2004). Teacher training in accordance with the learning and teaching transformation will contribute to the e-Teacher development as well as the effective development of instructional designers, organizers, and Implementers.

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