STEPP:
A Grounded Model to Assure the Quality of Instructional Activities in e-Learning Environments

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ABSTRACT

The present theoretical paper aims to develop a grounded model for designing instructional activities appropriate to e-learning and online learning environments. The suggested model is guided by learning principles of cognitivism, constructivism, and connectivism learning principles to help online learners constructing meaningful experiences and moving from knowledge acquisition to knowledge creation process. The proposed model consists of five dynamic and grounded domains that assure the quality of designing and using e-learning activities:

- Social Domain;
- Technological Domain;
- Epistemological Domain;
- Psychological domain; and
- Pedagogical Domain.

Each of these domains needs four types of presences to reflect the design and the application process of e-learning activities. These four presences are:

- cognitive presence,
- human presence,
- psychological presence and
- mental presence.

Applying the proposed model (STEPP) throughout all online and adaptive e-learning environments may improve the process of designing and developing e-learning activities to be used as mindtools for current and future learners.

Keywords: e-Learning, online learning, instructional activities, instructional design, mental models, web-based activities, e-learning activities models.

INTRODUCTION

Educational practices through the ages have been shaped by the dominant forms of communication, and the transitions from one age to the next age have caused great anxiety among educators of the time (Thornburg, 1996). While communication was an important skill in the industrial age, it has become the most important skill during the current age – the digital age.

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Digital age learning began with a poor initial pedagogical model of e-learning, based on a behaviorist and page-turning approach to learning.

The reality is that digital learning is becoming integrated into portals and work flows, even though it is not necessarily labeled as e-learning. The lines are increasingly blurred between learning and working, and many aspects of learning that occur online are not being measured as such (Driscoll, 2008). Today's learners live in a global-knowledge-based age. They deserve educators whose practices embrace the best that technology can bring to learning (International Society for Technology in Education (ISTE), 2002).

The Internet and the Web are the driving force of the future of the educational delivery, in which learners are allowed to choose and change not only the location and people, but also the time and context that learning takes place. The instructional environments became non-linear and concurrent than ever before. Therefore, it is questionable whether new instructional activities will support the non-linear and concurrent features of Web-based instruction and learning to educate our students to be life-long learners and successful contributors to other students learning. Such holonomic view will make student not only responsible for his own learning but also other students' meaningful learning as well.

Meaningful learning that can take place in virtual and e-learning environments is not reflected only in the preparedness of learning environments and state-of-the-art teaching strategies. It also reflects the extent of trust in the learning outcomes. Learners need to get convinced that learning in virtual and e-learning settings will be meaningful, and that they will acquire self-learning skills.

For meaningful learning to take place in virtual and e-learning environments, there should be, as conceived by the researcher, well-developed comprehensive instructional activities models to guarantee that meaningful learning is actually taking place. Such models are expected to build bridges of trust in the outcome of virtual and e-learning.

Virtual and e-learning are now facing challenges of the nature as challenges faced by Web-based learning. Such challenges are not related to weaknesses in software, apparatus or management of learning. Rather, they relate to the quality of learning activities from the learner's perspective (Downey, 2011).

With face-to-face teaching the educator receives continuous feedback from the students. Several non-explicit messages tell him if the speed of presentation is correct, and send other information which make possible to evaluate in real time the level of understanding, and tune properly the delivery (Corso, Forno, Morrone, & Signorile, 2006). This is not possible for e-courses and Web-based learning activities. They are prepared without an audience − or audience at delivery is different from the audience at preparation. Therefore, they must be designed very carefully and effectively with specific methodology to coach and train learners' minds (Corso, Forno, Morrone, & Signorile, 2006).

The holonomic concept is shifting Web-based and e-learning environments from ordinary one into an adaptive and effective learning environment.

According to the National Research Council (NRC), effective learning environments are consisted of four basic components:

> ➢ knowledge-centered wherein the emphasis is on understanding rather than remembering;
> ➢ learner-centered, wherein individual learners' personal and cultural backgrounds and learning styles are valued;
> ➢ community-centered, wherein learning activities are collaborative and foster a community of practice that involves legitimate peripheral participation; and
> ➢ assessment-centered, wherein formative assessment is used to make students' thinking visible to them and evaluation is performance-oriented (Rhodes, 2011).

The author may add one more components to the previous ones. This component is that effective learning environment is activity-guided in which instructional activities is the capital of any e-course delivery.

The researcher believes that currently available instructional activities models for e-learning environments need to be evaluated and enhanced in order to assimilate the continuous change in adaptive and e-learning environments, and social communication channels that are recently increasing in number and spreading everywhere.

In this regard, Heide & Henderson (2001) reported that there are a number of important reasons for adaptive models of instructional activities, and they are:

> ➢ our students live in a world of technology;
> ➢ new technologies can enrich and expand learning, increase the productivity of teachers and students, and enhance their lives beyond the classroom;
> ➢ research continually provides us with new information on how we learn and how technology can be of assistance in the teaching/learning process;
> ➢ there is an ever-widening diversity of student needs in every classroom and these students have different learning preferences, and
> ➢ the workplace demands a new repertoire of skills and competencies.

Based on his experience in e-learning, managing e-learning centers and teaching e-courses, the researcher noticed that instructional activities in virtual and e-learning environments continues to be based on traditional methods such as online chat, discussion forum and e-mail that do not enhance knowledge creation, especially when learners are exposed to situations requiring the application of what they have learnt.

In such a context, the learner focuses on passing courses and not on self-promotion. Retention of learnt experiences is based on learners' ability to construct and organize meaningful cognitive structure, which helps them to self-generate new experiences in the future.

Even though e-learning management systems make available tools and programs that can be used in learning activities, they focus on the use of varied traditional methods through media. Traditional activities don't extend to cover the depth of learning and meaning making.

Thus, this paper attempted to suggest a grounded model for designing e-learning instructional activities based on the non-linear and interactive features of the digital learning and instruction through the Web and the Internet. The premise of this grounded model was based on the belief that adaptive learning environments are important medium in teaching and learning process and need to be integrated into Web-based instruction more than ever before (Abdelaziz, 2012 A). Adaptive learning environments introduce another source of knowledge, skills and values. The introduction of an adaptive and interactive activities of learning means that instructors may spend less time presenting knowledge to groups of students and more time facilitating small groups work and guiding students to appropriate resources of curriculum. This shift will more likely involve a change in all instructional practices and delivery of Web-based education. This shift will also keep our learning with the Internet and the Web more holonomic than ever before.

Nowadays, students are learning in a technology-rich environment that is collaborative and knowledge building. Thus, technology-rich environment requires a special type of holonomic and adaptive instructional activities. The main features and components that can be used to visualize, direct, and manage the process of e-learning activities according to this new model are presented in thin paper. A *STEPP* is needed to move e-learning and instructional activities from stand-alone physical benchmarks to multitask mental benchmarks.

THEORETICAL BACKGROUND

Improving The Quality of E-Learning Instructional Activities

What shall we do when information is doubling every 73 days or less? One rational answer is to train students to learn how to learn and contribute to other students learning in an ever-changing society. In order to develop such training/learning activities, we need to adopt a student-centered activities and materials where students can become adept to new information in light of their own needs based on their academic and culture background (Gillani, 2003). According to Merrill (2008, p. 397), "many of current e-learning models could be characterized as e_3 —learning (e sub-three learning): enervative, endless and empty".

> ➤ *Enervative* means that learning is focusing in knowledge acquisition not in generating ideas and innovative solutions.
> ➤ *Endless* means that learners are passive receiver of knowledge; they avoid interaction and engagement in meaning making situations.
> ➤ *Empty* means that current learning e-learning models fail to apply new instructional strategies that promote active feedback and feed forward.

Many of educational literatures and studies pointed out several characteristics to assure the quality of Web-based instructional activities. One of these studies is Merrill's study (2008). Merrill pointed out three characteristic of e-learning activities.

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"E-learning activities according to Merrill's model should be: effective, efficient, and engaging (e^3 learning-e to the third power learning activities) (p. 398)."

The National Research Council (NRC) has also reported that there are five ways that e-learning activities can be used to help meet the challenges of establishing effective learning environments:

> ➢ **Bringing authentic problems into classroom through the use of videos, games, simulations, and Internet connections to concrete data;**
> ➢ **Providing "scaffolding" support to augment what learners can do and explain about on their path to understanding;**
> ➢ **Increasing opportunities for learners to receive feedback from software tutors, teachers, and peers;**
> ➢ **Building local and global communities of teachers, administrators, students, parents, and other interested learners or groups; and**
> ➢ **Expanding opportunities for educators' learning. (NRC, 2001).**

"The effective teaching of Web-based courses requires knowledge of both the activity structures/types that are appropriate for teaching specific content and the manners in which particular technologies can be utilized as part of the lesson, project, or unit design" (Harris, Mishra, & Koehler, 2009, p. 406).

To assure the quality of designing and applying e-learning activities in online and Web-based learning environments, several factors should be considered. These factors are discussed below. These factors are also representing the main domains of the proposed model in current research, which could be called *STEPP* model. Where, *S* refers to the social and human domain, *T* refers to the technological domain, *E* refers to the epistemological domain, *P1* refers to the psychological domain and *P2* refers to pedagogical domain.

The Social/Human Domain

With the increasing demand of e-learning and Web-based and online teaching nowadays, the educators' roles are decreasing and the technology and pedagogy roles are increasing. To face this issue and guarantee the quality of e-courses delivery, we should develop effective instructional activities that substitute the absence of educators.

According to social constructivism theory, there are different views in the surrounding world. It is rare to find two learners having the same experiences and perceptions as each constructs meaning in his/her own way. This explains differences in our views that we can share with others (Lefrancois, 1999). Is diversity in views reflected in e-learning activities?

One of the main principles of learning according to social contructivism theory is that meaning can be shared with others. Thus, meaning construction can result from discussion with others. Because we share the world around us, we can also share meanings constructed through it.

The learner is a human being who is affected by the changes made by others. Hence, meanings can be constructed through effective social/human interaction.

This interaction results in what is called "Communities of Inquiry and Practice". These communities enhance the concept of collective learning versus individual learning. Unfortunately, individual learning is still used in Web-based learning even though its value is lower than the value of collective learning (Conrad & Donaldson, 2011).

In addition, Harris (1998) stated that interpersonal exchange is a helpful strategy to engage online learners from a distance. This strategy gives students an opportunity to interact with others from a distance. By doing so, they come to appreciate how differently people see and make sense of their world. They also have opportunities to reinforce literacy skills through extended reading and writing activities. Harris (1998) cites several examples of interpersonal exchanges activities: "*Keypals, Global classrooms, Electronic appearances, Electronic mentoring, and Impersonations.*" (p. 83)

Salmon (2004) agreed with Harris (1998) regarding the importance of online socialization matter. In her model of e-Tivities, Salmon (2004) presented a five stages model for e-Tivities:

> ➢ access and motivation;
> ➢ online socialization;
> ➢ information exchange;
> ➢ knowledge construction; and
> ➢ development.

In online and Web-based learning environments, meaning can be communicated through tools, culture and society. When we interact with others in communities of inquiry, our knowledge and beliefs are affected by knowledge and values of the surrounding community. This constitutes what can be termed "Collective Memory". Participation is collective memory makes learning societies dynamic. The quantity and quality of collective memory vary according to the quantity and quality of individuals' knowledge (Abdelaziz, 2012).

Online and Web-based teaching is great gates to develop a culture of learning that promote global mind and collective memory. Online educators should be guides and directors of online students' activity without forcing their will on students. Hence, online teaching should be collaborative process to increase the Zone of Proximal Growth among learners (Lefrancois, 1999).

Social and human factor is the feel that online learners communicate with people instead of technological objects. When social presence is high, each online learner has the feeling of engaging in meaningful actions. Cobb (2009) agrees with this. He concluded that social presence is one concept that has been explored in relation to the quality of online learning experience.

To sum it up, the author believes that online socialization and interpersonal exchanges can increase the probability of shifting online learning from being just a community of inquiry to a community of practice. Community of practice is a future theme for collective, collaborative and global mind which reflects the capabilities and skills of 21st century learners.

The Technology Domain

Designing adaptive e-learning activities needs a specific type of integration between asynchronous and synchronous technology to reflect the diversity of learning styles among online learners. Using variety of asynchronous and synchronous activities can support most of the interactions taking place in e-learning and Web-based learning environments (Anderson, 2008).

Asynchronous activity-type fits only with the lowest level of interaction such as, learner-interface interaction, learner-content interaction and learner-learner interaction. Whereas, synchronous activity-type is appropriate for highest level of interaction such as, learner-support interaction, learner-instructor interaction and learner expert-interaction. Using asynchronous or synchronous activities alone is not promoting the 21st century skills among online learners which are depending mostly on context of learning not on content of learning.

In this regard, Anderson (2008) stated that "there should be strategies to promote learner-context interaction, to allow learners to apply what they learn in real life so they can contextualize the information. Learner-context interaction allows learners to develop personal knowledge and construct personal meaning from the provided information". (p.33)

Table: 1
Learning Activities Facilitated by Different Levels
of Computer Networking Technologies

Levels of Interaction in e-learning	Description	Enabling Technologies	Learning Activities
Learner-interface; Learner-content (One-alone)	Individual can access information resources stored on the World Wide Web. These resources can also be used by groups.	On-line databases and journals , Software libraries, Tutorials and job aids and Other Web resources	Independent Inquiry Research and writing Browsing
Learner-support Learner-learner Learner-teacher Learner-expert (One-to-one)	Individuals can communicate to other individuals using e-mail, and can arrange for individual learning experiences such as internship or independent studies.	E-mail Chatting technologies using text, audio, and/or video	Apprenticeships and internships E-mail posts, private consultations One-on-one chats
Learner-support Learner-context (One-to- many)	Individuals can broadcast information to entire groups, information can also be published at Web sites to allow others access.	Distribution lists Web Pages as a source of text and multimedia displays, Web pages as links to outside resources.	Lectures and symposiums Publishing results of research and inquiry activities, Convenient access and dissemination of resources
Learner-context (Many-to-any)	Groups of people can engage in open communication, through various discussion and activity forums, both real-time and synchronously.	Listservs Chat and conferencing technologies MUD and MOO systems	Debates, Discussion and support groups, Group exercises and projects MUD and MOO learning activities

It could be noticed from the previous paragraphs that using a variety of communication technologies and interactions is one of the most important factors to assure the quality of instructional activities of e-learning.

Thus, both level of interactions and enabling technologies should be reflected while designing e-learning activities. For this reason, the researcher has emerged and integrated the level of interactions with enabling technologies that were stated by both Jonassen, Peck, & Wilson (1999, p. 123) and Anderson (2008, p. 32). Table: 1 matches the levels of e-learning activities with enabling communication technologies. As the World Wide Web (WWW), the Internet, and telecommunications have become the common tools of instruction in the digital age, the linear features of the traditional models no longer fit or meet the "learning focused" instructional activities. Perhaps the most important of all implications is that much of the designing should be done by the learners while they are learning, with help from a computer system and/or the teacher and other students generating options (Horton, 2011). In this regard, Harris (1998) has developed a list of activity structures suitable for the adaptive classroom, demonstrating the variety of activities that telecommunications enables (p. 83). Harris's telecommunications activities are summarized on the following:

Information Collection
The focus of these activities is on collaborative, distributed collection, analysis, organization, and presentation of information. Students can participate in every step of this process. Information activities may help students internalize scientific methods. They may also strengthen students' information literacy skills. Examples include: Information exchanges, Database creation, Electronic publishing, Electronic field trips, Pooled data analysis.

Problem-Solving Projects
These projects focus on individual, small group, or multi-group problems. They often require higher levels of collaboration and organization between sites. Students have opportunities to learn task-management skills in addition to content objectives. Examples include: Information searches, Parallel problem solving, Electronic process writing, Serial creations, Simulations, Social action projects.

Psychological Domain
Learning styles are yet another quality factor that should be considered while designing e-learning activities. For better activity design, online educators need to pay attention to this factor if they hope to engage every member of the group, from a solid and successful learning community, and achieve the objectives of the e-course (Palloff & Pratt, 2003). A variety of e-learning activities and materials should be included in online instruction to accommodate individual differences and learning and cognitive styles (Anderson, 2008). Cognitive style refers to a learner's preferred method of processing and understanding information. It represents the person's typical mode of thinking and problem solving. Learning and cognitive styles also reflect the psychological domain of learning. The central theme of psychological factor in e-learning activities is that learner can transfer the knowledge-based content into real and authentic actions. Authentic actions are very important to guarantee skill building and acquisition. One of the main characteristics of psychological domain is that it gives the student a read on how people learn. Thus, psychological interaction focuses on body language and its impact on convincing learners who are having ideas to learn from.

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It's a mistake to assume that every online learner receives and processes information the same. Online learners learn best when they approach knowledge in way they trust (Palloff & Pratt, 2003). The ability to transfer and generalize learning outcomes is depending mostly on the degree of trustworthiness that learner's mind gets from e-learning activities and materials. It could be concluded that psychological domain is one of the most important factor that should be considered while selecting or designing e-learning activities. Learner's psychological characteristics empower online learners to develop multiple pathways to learn and to build their own meaning of learning. Table: 2 provides a matrix to match students' learning style and appropriate online instructional techniques and activities (adopted with permission from: Palloff & Pratt, 2003, p. 37-38).

Epistemological Domain

The content structure and knowledge type is yet another important factor to consider while selecting or designing e-learning instructional activities. It's so critical for online educators to understand knowledge type and level of online materials. Knowing the knowledge type will enable educators to design the most effective instructional materials and interactions. Schone (2007) stated that the content can be classified into four types of knowledge: *Factual Knowledge, Conceptual Knowledge, Procedural Knowledge and Metacognitive Knowledge* (p. 8).

Table: 2
Online Instructional Techniques and Activities to Address Various Learning Styles

Learning Style or Preference	Instructional Techniques and Activities
Visual-verbal: Prefers to read information.	Use visual aids, such as PowerPoint or whiteboard. Provide outlines or lecture materials in written form. Use written materials, such as textbooks and Internet resources.
Visual-nonverbal or Visual-Spatial: prefers working with graphics or diagrams to represent information.	Use visual aids, such as PowerPoint, video, maps, diagrams, and graphics. Use Internet resources, particularly those that contain graphics. Use videoconferencing.
Auditory-verbal or verbal-linguistic: prefers to hear material being presented.	Encourage participation in collaborative and group activities. Use streaming audio files. Use audio conferencing.
Tactile-Kinesthetic or bodily-kinesthetic: prefers physical, "hand-on" activity.	Use simulations. Use virtual labs. Require outside fieldwork. Require presentation and discussion of projects.
Logical-mathematical: prefers reasoning, logic, and numbers.	Use case studies. Use problem-based learning. Work with abstract concepts. Use virtual labs. Encourage skill-based learning.
Interpersonal-relational: prefers working with others.	Encourage participation collaborative and group activities. Use discussion board. Use case studies. Use simulations
Intrapersonal-relational: Prefers reflection and working with others.	Encourage participation in collaborative and group activities. Use discussion board. Use case studies. Make use of activities requiring self-and group assessment.

Content structure reflects the epistemological bases that each learner in both face-to-face and e-learning environments should know and be able to use throughout his personal or career life. Breaking e-content into small and sequenced chunks during designing e-learning activities helps to prevent cognitive overload during processing in working memory. To assure the quality of e-learning instructional activities, online activities should be organized and presented to reflect content structure and levels of knowledge.

In this regard, Horton (2008) reported that Web-based learning activities are providing creative solutions to qualify and quantify learning through the following five strategies:

> ➢ Increasing knowledge, by making it more accessible to people;
> ➢ Capturing knowledge, by making it easier for people to record what they know;
> ➢ Refining knowledge, so it is expressed in a way that's useful to others;
> ➢ Sharing knowledge, which involves making knowledge accessible. Keeping knowledge chunks small and easy to find and quick to use and reusing knowledge; and
> ➢ Applying knowledge, which is, acting on the messages in the content.

Chunking e-learning activities is yet another approach to train online learners' mind to encoding knowledge without extra load. It helps motivating learners and keeping them active, which facilitates the creation of personalized meaning. The chunking and sequencing e-learning activities could take the form of simple to complex, known to unknown, knowledge to application, and factual to procedural knowledge (Anderson, 2008).

Pedagogical Domain

Cognitivism, constructivism and connectivism perspectives were adopted as pedagogical frameworks for this dynamic model. The underlying theme of cognitivism learning is that learning is a method to model the process of interpreting and constructing meaning from understanding. As learners' performance becomes more expert-like and fluent so the component skills become automated (Mayes & Freitas, 2012). Constructivism has a substantial impact on views pertaining to the conditions and instructional strategies and activities essential to build and organize learners' knowledge. Increasingly, mainstream cognitive approaches to learning have emphasized the assumptions of constructivism that understanding is gained through an active process of creating hypotheses and building new forms of understanding through activities (Mayes & Freitas, 2012).

In the meanwhile, constructivism gives a considerable attention to the social culture of learning. This view of learning focuses on the way knowledge is distributed socially.

When knowledge is seen as situated in the practices of communities then the outcomes of learning involve the abilities of individuals to participate in those practices successfully (Mayes & Freitas, 2012).Both cognitivism and constrcutivism are sharing some learning principles about effective instructional activities, which can be summarized in the following (Driscoll, 2002):

- ➢ **engage learners in activities authentic to the discipline in which they are learning,**
- ➢ **provide for collaboration and the opportunity to engage multiple perspectives on what is being learned,**
- ➢ **support learners in setting their goals and regulating their own learning, and**
- ➢ **encourage learners to reflect on what and how they are learning**

Barab & Duffy (1999) pointed out that there are at least two 'flavors' to situated learning. One can be regarded as a socio-psychological view of situativily. This emphasizes the importance of context-dependent learning in informal settings. This activity-guided view of situated learning led to the design of what Barab & Duffy call 'practice fields' this authentic to the social context in which the skills or knowledge are normally embedded in the situation (In: (Mayes & Freitas, 2012).

Constructivism has also a substantial impact on views pertaining to the conditions and instructional approaches essential to build and organize learners' knowledge and authentic experience (Savery & Duffy, 1995). Constructivism has considerable pedagogical views regarding how to contribute and support other people learning through a process of collaboration and social inquiry. The collaborative social inquiry is important for learners in that it maintains good rapport with team and fostering open communication, collaboration, creativity, initiative, and appropriate risk taking (Corcoran et al. 1995; Loureiro & Bettencourt, 2010).

From previous two paragraphs we can say that both congnitivism and constructivism gave a great attention to cognitive and social presence while designing e-learning activities. Those two presences are important to visualize and manage the knowledge making process among online learners.

In the meanwhile, connectivism has considerable views regarding how to contribute, delve and support other people learning. It emphasizes on neural network learning. This approach sees knowledge states as represented by patterns of activation in a network of elementary tasks. In a networked world, the very manner of information that we acquire is worth exploring. We derive our competence from forming connections (Siemens, 2004). This perspective addresses learning that occurs outside of people (i.e. learning that is stored and manipulated by technology). A network can simply be defined as connections between entities. Computer networks, power grids, and social networks all function on the simple principle that people, groups, systems, nodes, entities can be connected to create an integrated whole.

Principles of Connectivism (Siemens, 2004)
- ➢ **Learning and knowledge rests in diversity of opinions.**
- ➢ **Learning is a process of connecting specialized nodes or information sources.**
- ➢ **Learning may reside in non-human appliances.**
- ➢ **Capacity to know more is more critical than what is currently known.**
- ➢ **Nurturing and maintaining connections is needed to facilitate continual learning.**
- ➢ **Ability to see connections between fields, ideas, and concepts is a core skill.**

> ➢ **Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.**
> ➢ **Decision-making is a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality.**
> ➢ **While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.**

It could be noticed from connectivism principles of learning that both psychological presence and social presence are main components of networked learning. Thus, e-learning activities should give an emphasis on those two kinds of presence.
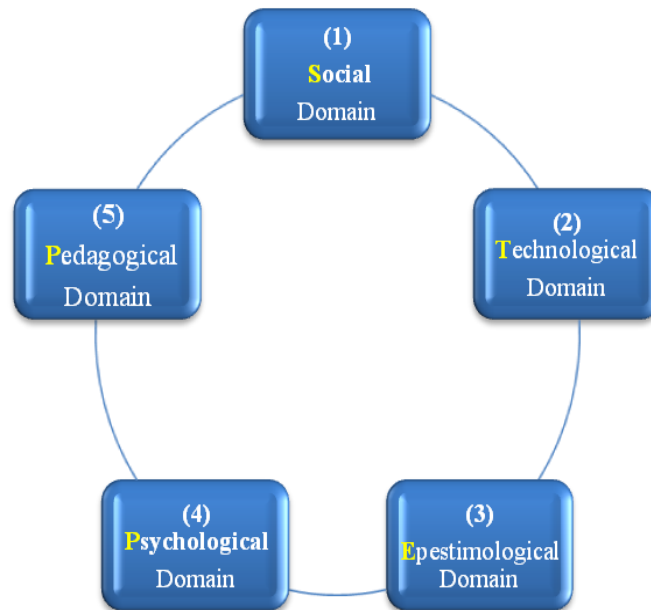
In summary, the quality of e-learning activities can be assured by the following indicators:

> ➢ **Understanding how our students learn (*theoretical and pedagogical indicator*).**
> ➢ **Awareness of the issues that affect students' lives and learning and how they bring them into the e-learning classes (*psychological indicator*).**
> ➢ **Understanding what virtual students need to support them in their learning (*technological and human/social presence indicator*).**
> ➢ **Understanding how to assist virtual students in their development as reflective practitioners (*psychological indicator*).**
> ➢ **Finding a mean to involve virtual students in e-course design and assessment (*pedagogical indicator*).**
> ➢ **Respecting students' rights as learners and their role in the learning process (*Mental and cognitive indicator*).**
> ➢ **Understanding how to develop e-courses and programs with an eye to continuous quality improvement so that students stay in the learning process and move smoothly in the direction of their goals, objectives, and values (*epistemological indicator*).**

It could be noticed that previously mentioned Harris's model (1998) and Salmon's model (2002) gave a great attention to information exchange and knowledge construction activities. But the proposed model *STEPP* of e-learning activities is giving great attention to the pedagogical, epistemological, social, and mental activities.

In this paper, the author introduces a grounded model to assure the quality of selecting and designing e-learning activities based on learning principles of educational perspectives and quality factors above mentioned. This model goes beyond technocentric strategies and emphasizes the importance of helping both educators and online learners develop and apply integrated and interdependent understanding of e-learning activities that fit with technology, pedagogy, learning styles, content, and context of e-learning. The proposed model of designing e-learning activities is consisted of five domains that guide both online educators and learners' teaching and learning context.

Based on the quality factors and theoretical perspectives previously mentioned, the author represents the domains of e-learning activities model (*STEPP*) in Figure: 1.

(1)
Social
Domain

(5)
Pedagogical
Domain

(2)
Technological
Domain

(4)
Psychological
Domain

(3)
Epestimological
Domain

Figure: 1.
The domains of STEPP model for e-learning activities

To ensure effective application of each of the previous dimensions, each dimension needs four types of presence: Social presence, Cognitive presence, Psychological presence and Mental presence. These four types of presence are reflecting the importance of community of inquiry and practice model while selecting and /or designing e-learning activities for Web and Internet based learning.

The community of inquiry was developed in the late 1990s in response to the emergence of text discussion forums and the constructive generation of distance education pedagogy (Garrison, Anderson, & Archer, 2000).The central characteristic of the community of inquiry is that effective learning and educational experience occur at the confluence of three distinct types of presence; social, cognitive and teaching (Garrison, Anderson & Archer, 2000).

Lessiter, Freeman, Keogh, & Davidoff (2001) defined presence as a user's subjective sensation of "being there" in a mediated context. There are three types of presence: social presence, educator presence and cognitive presence. Social presence can be defined as the extent to which a student's true self is projected and perceived in an online course (McKerlich, Riis, Anderson & Eastman, 2011). Educator presence is the direct and indirect role and influence of the educator and perhaps senior students in the design, direction and facilitation to ensure a meaningful educational experience (Anderson, Rourker, Garrison & Archer, 2001). Cognitive presence is defined as the extent to which a learner can construct and confirm meaning through dialogue in a critical community of inquiry (Garrison, Anderson & Archer, 2000).

According to what is previously mentioned, e-learning in a virtual world is often perceived as a rich educational experience that includes elements of all three types of presence in the community of inquiry: social presence, educator presence and cognitive presence. The researcher believes that these three types could be the focal point for the new model of e-learning activities (*STEPP*).

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The author also believes that these three types can be adjusted to be four types with some major changes to create adaptive and active e-learning activities for online and virtual learning environments. These four presences activities are: social presence, cognitive presence, psychological presence and mental presence. In the following, the author presents shortly each type of presence and its importance for designing e-learning activities.

Social Presence Activities

In social presence, online learner is presenting his position on virtual worlds as role model for other students. As part of his presentation, the learner wants to show his fellow learner how additional activity can be used to achieve interpersonal skills needed in learning situations. Dacko, (2006) concluded that giving strong interpersonal skills is essential to strong everyday comradeship, thus, there is a clear need for strengthening interpersonal skills among learners' practitioners to speed the generating and transfer of knowledge within and across organizational boundaries.

Richardson & Swan (2003) stated that teacher immediacy behaviors and the presence of others are especially important issues for those involved in delivering online education. In online learning environments, students with high overall perception of social presence scored high in terms of perceived learning and perceived satisfaction with the instructor.

Computer-mediated communication tools are important tools to increase the effectiveness of social presence in online learning environments. E-mail, bulletin board and real-time discussion are found to be effective tools to influence the level of online social presence and privacy (Tu, 2002). To maximize the social presence in online and Web-based learning environments according to STEPP model, the following e-learning activities listed in Table 3 are suggested.

Table: 3
The E-learning Activities Types Compatible with Social Presence.

Presence Type	Examples	Compatible e-Learning Technologies*
Social presence activities	1. Group discussion	Discussion forum, blogs, wikis, chartrooms.
	2. Debate	Discussion forum, e-mail. Chat.
	3. Simulation	Virtual reality Web sites, simulation software, animations.
	4. Answer questions	Discussion boards, wikis, whiteboard, e-quiz and polling software.
	5. Create a game	
	6. Do a presentation	Word Processors, imaging tools, Web authoring software, specialized game-making software.
	7. Engage in role play	
	8. Create a diary	Presentation software, multimedia capture/editing software.
		Presentation software, multimedia capture/editing software. Wikipedia.

*Some of these Compatible Learning Technologies were adopted from Harris, Mishra, & Koehler (2009).

Cognitive Presence Activities

In cognitive presence, students are presented with theoretical statements via the "opinionator", a free virtual world tool that animates a Likert-like questionnaire scale.

This provides an opportunity for students to position themselves and then ask questions about the theoretical point, and engage in an exchange of ideas as they explain their decisions to each other. Students display their positions by virtually placing their avatars on the opinionator. During the discussion, some students may change their position, due to the arguments of fellow students. Some students favorably compare the engagement and presence of this experience as opposed to having a similar discussion in a conventional, text-based LMS (McKerlich , Riis, Anderson & Eastman, 2011). A deep approach to learning must consider cognitive presence since social presence alone is not enough to measure meaningful learning outcomes. Cognitive presence reflects the interaction among ideas that online learners get from online learning context. Garrison & Cleveland-Innes (2005) concluded that neither social presence nor the surface exchange of information can create the environment and climate for deep approaches to learning meaningful education exchanges. To facilitate higher levels of learning in online settings, a combination of social and cognitive presence e-learning activities is needed (Kanuka & Garrison, 2004).

Furthermore, the cognitive presence activities were found to be an effective element to help online learners in both online and blended courses reach high level of learning outcomes and processes (Akyol & Garrison, 2011). To maximize the cognitive presence in online and Web-based learning environments according to STEPP model, the following e-learning activities listed in Table: 4 are suggested.

Table: 4
The E-learning Activities Types Compatible with Cognitive Presence.

Presence Type	Examples	Compatible e-Learning Technologies
Cognitive Presence activities	. Read online text	1. E-books, Web browsers, CD-ROM, document view.
	. View presentation	2. Presentation software, e-note taking tools, audio/video, whiteboards, concept mapping software.
	. View Images	3. Image/animation/video editing and display software.
	. Research	4. Traditional and online books, encyclopedia, Wikipedia.
	. Artifact-based inquiry	5. Artifact kits, online books and journals, Wikipedia.
	. Data-based inquiry	6. Web sites, online databases, WebQuest.
	. Answer questions	7. Discussion boards, wikis, whiteboard, e-quiz and polling software.
	. Complete charts/table	8. Excel or other data processing software, concept mapping.
	. Take a test	9. Quiz software, survey software.

Psychological Presence Activities

In psychological presence, learners are virtually emulating an observable behavior for a person (coach) who is dealing with others in a learning situation.

The central them of psychological presence activities is that learner can transfer the knowledge-based content into real and authentic actions.

Authentic actions are very important to assure skills building and acquisition.

One of the main characteristics of psychological presence is that it gives the student a read on how the learners are responding.

Thus, psychological presence focuses on body languages and its impact on convincing learners who are having different opinions. Psychological presence activities give online learners a sense of *being there*.

They motivate learners to stay engaged for as much as they could in online learning context (Abdelaziz, 2012 A).

Psychological presence activities also sustain the engagement of online learners through e-coaching activities.

E-coaching activities play an integral role in the community of online learning. They can play the following roles (Abdelaziz, 2012 C, p. 8):

Motivator

E-coaches increase their ability to serve this role by making themselves available by e-mail, and instant messages.

Integrator

To serve as an integrator who connects the responsibility to useful people, tools and resources.

Several coaches can use e-mail to share useful resources such as links to online articles or videos, or to send documents, spreadsheets, and templates.

Trainer

By identifying professional development opportunities and suggesting learning and development paths using assessment tools such as personality inventories or 360°-assessment feedback.

Performance Monitor

Provide just-in-time support and advice for higher ranking individuals where the e-coach facilitates self-reflection and discovery.

To maximize the psychological presence in online and Web-based learning environments according to STEPP model, the following e-learning activities listed in Table: 5 are suggested.

Table: 5
The E-learning Activities Types Compatible with Psychological Presence.

Presence Type	Examples	Compatible e-Learning Technologies
Psychological presence activities	Listen to audio	1. Web sites, MP3 Players, podcasts, radio, tape players, CD players.
	Group discussion	2. Discussion forum, blogs, wikis, chartrooms.
		3. Video, virtual reality systems, online museums, galleries, and exhibitions.
	Field trip	4. Discussion forum, e-mail. Chat.
		5. Presentation software, word processing, Web authoring tools, graphic tools.
	Debate	6. Presentation software, multimedia capture/editing software
	Design an exhibit	7. Word processing, storyboarding software, video/audio editing tools.
		8. Word Processing, Web site design, blogs, wikis.
	Engage in role play	
	Do a performance	
	Engage in team actions	

Mental Presence

Mental presence refers to learners' ability to construct meaningful knowledge and skills. It can be defined as "meaning building or making" in which learners are having new lines of knowledge applications. In mental presence process, learner is coaching her/himself to emerge knowledge and skills. Jonassen, Peck, & Wilson (1999) used mental presence as synonym to *"mindtools"* in which learner are constructing knowledge bases that represent personally relevant and meaningful knowledge while learning from virtual world.

Table: 6
The E-learning Activities Types Compatible with Mental Presence

Presence Type	Examples	Compatible e-Learning Technologies
Mental presence activities	. View images . Simulation . Artifact-based inquiry . Data-based inquiry . Answer questions . Create a map . Complete a review activity . Create a diary . Develop a metaphor 0. Build a model	. Artifact kits, online books and journals, Wikipedia. . Virtual reality Web sites, simulation software, animations. . Artifact kits, online books and journals, Wikipedia. . Web sites, online databases, WebQuests. . Discussion boards, wikis, whiteboard, e-quiz and polling software. . Cartographic software, Google Maps, Drawing software. . Courseware, quiz polling software, wikis. . Word Processing, concept mapping, e- documents, Wikipedia. . Image banks, graphics editors, multimedia authoring tools. 0. Modeling, simulation construction, graphic software, multimedia production tools.

The main product of mental presence is new and creative and adaptive techniques to deal with future requirements of learning situations. These new techniques can be distributed and shared as mental images with other learners through a line of community of inquiry and practice. To maximize the mental presence in online and Web-based learning environments according to STEPP model, the following e-learning activities listed in Table: 6 are suggested.

SUMMARY

The previously mentioned four main types of presence of effective e-learning activities might be used as grounded elements of any instructional approach or strategy for teaching in virtual or e-learning environments. In virtual world, learners and teachers can actively create, use and re-use learning objects through a process of interaction and coaching, where their presence is created and enhanced. It is through this lens that the researcher focuses on virtual and electronic activities in this paper as a grounded model that has the potential to create rich sense of e-learning activities to develop online learners' abilities and values.

To put this model into action, online educators should emerge the four types of e-presence to allow online learners to apply what they learn in real life so they can contextualize the information and build meaningful learning experiences.

To facilitate meaning making process in online and Web-based learning contexts, a combination of social, cognitive, psychological and mental presence e-learning activities is needed. Online educators should rotate and interchange all types of e-presence activities.

For example, online educator can design online learning tasks to include: group activities (social presence), research and information collection and analysis (cognitive presence), make online debate through online role play (psychological presence), and develop personal metaphor based on previously mentioned tasks (mental presence), and so on.

RECOMMENDATIONS FOR FURTHER STUDIES

To validate the proposed e-presence activities mentioned in STEPP model, there exists a real need for examining the effect of using this model on learning subject matters in several online and blended contexts. Online educators may also need to investigate the impact of using e-presence activities on developing the 21st century skills among students in all educational settings and levels.

This could be done through a qualitative inquiry to explore the best practices of using e-presence activities in developing creative and critical thinking skills for example. Both subject matter experts and instructional designers in e-learning environments need an in-depth training program to maximize using of all e-presence activities while designing, delivering and assessing online, Web-based and blended courses. In addition, there exists a real need to develop e-rubrics list to measure the effect of e-presence activities mentioned in STEPP model to assure the quality of teaching blended, online and Web-based courses.

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