

INTERACTION IN ON-LINE LEARNING: ISSUES, BENEFITS AND IMPLICATIONS.

Dr. Fidelis Iweka and Dr. Jerry Edebor Odias

ABSTRACT

On-line learning is now becoming ubiquitous at all levels of education, in all institutions of learning and in the work place through computers and Internets. Distance education has been at the vanguard of these developments, but campus-based students are also mixing and matching their classroom lectures with on-line in all sets of often unanticipated ways. The paper begins with a general review of the concept of interaction in on-line learning. Attempt was made to explore the peculiar factors that triggered on-line learning. The focus of the paper is majorly on the benefits, challenges and implications of on-line learning to educational development in Nigeria in order to actualize the version 20:2020.

Concepts of Interaction in on – Line Learning

Communication technologies are used in educational to enhance interaction between all participants in the educational transaction. However, although interaction has long been a defining and critical component of the educational process and context, and it are surprisingly difficult to find a clear and precise definition of this concept in education literature.

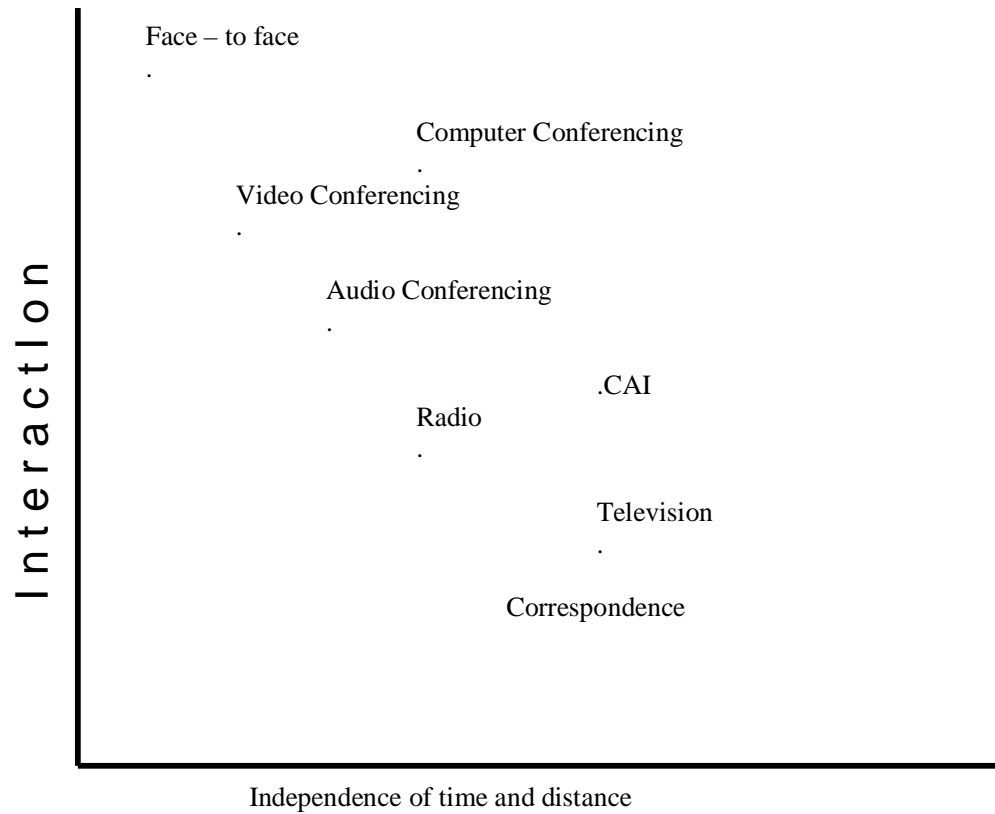
In popular culture, the use of the term to describe everything from toasters to video games to holiday resorts further confuses precise definition. But the researcher will here simply accept wagers (1994) definition of interaction as reciprocal event that require at least two objects and two actions. Interactions occur when there objects and events mutually influence one another.

Interaction or interactivity serves a variety of functions in educational transaction. Sims (1999) has listed this function as allowing for leaner control, facilitating program adaptation based on learner input, allowing various forms of participation and communication, and acting as an addition, interactivity is fundamental to creation of the learning communities. Finally, the value of another person’s perspective, usually gained through interaction, is a key learning component in constructivist learning theories, and in inducing mindfulness in learners.

Interaction has always been valued in distance education, even in its most traditional, independent study format. Holmberg (1989) argued for the superiority of individualized interaction between student and tutor when supported by written postal correspondence or by real time telephone tutoring. There is also the idea of simulated interaction that defines the writing style appropriate for independent study models of distance education, programming that is referred to as “guided didactic interaction.” Garrison and shale (1990) defined all forms of education including that delivered at a distance as essentially, interactions between contact, students and teachers.

Laurillard (1997) constructed a conversational model of learning in which interaction between students and teachers play a critical role. Interactivity should be the primary criterion for selecting media for educational deliverery. Thus, there is a long history of study and recognition of the critical role of interaction in supporting, and even defining education.

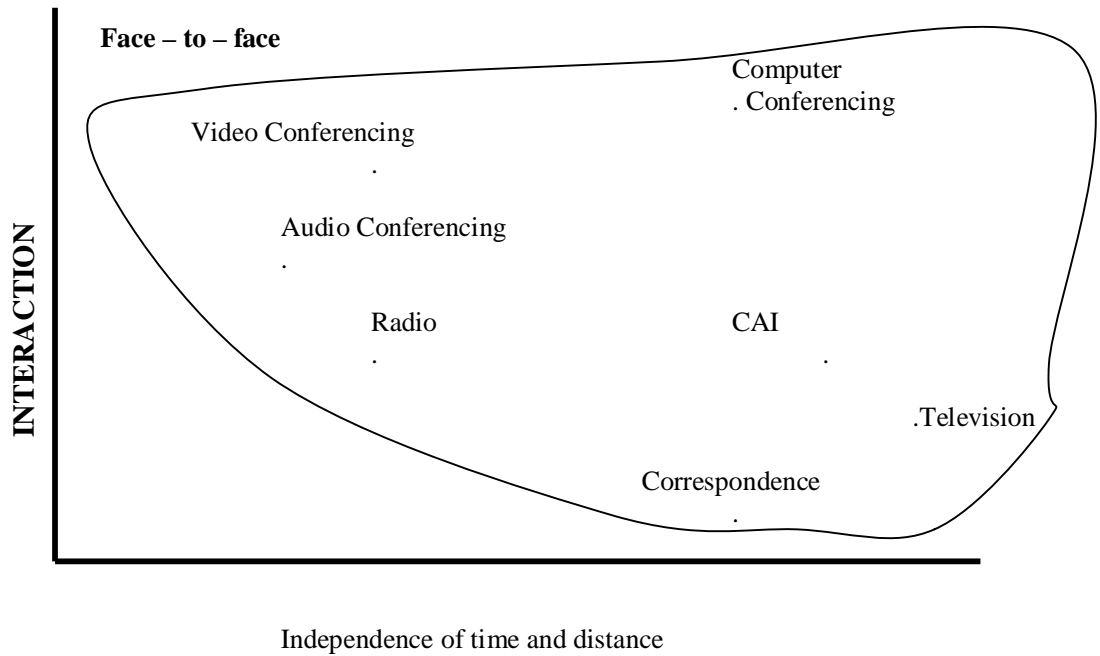
Figure 1



The web affords interaction in many modalities. In Figure 1, one can see the common forms of media used in distance education charted against their capacity to support independence of time and place and their capacity to support interaction. It can be seen that, generally, the higher and richer the form communication, the more restrictions it places on independence.

Figure 2, Shows the capacity of the web to support these modalities. As can be seen, all forms of mediated educational interaction are now supported, assuming one adds to the use of the web to enhance classroom based education.

Figure 2



Thus, the capacity for the web to support online learning in general is usually too large a domain for meaningful discussion until one specifies the particular modality of interaction in use.

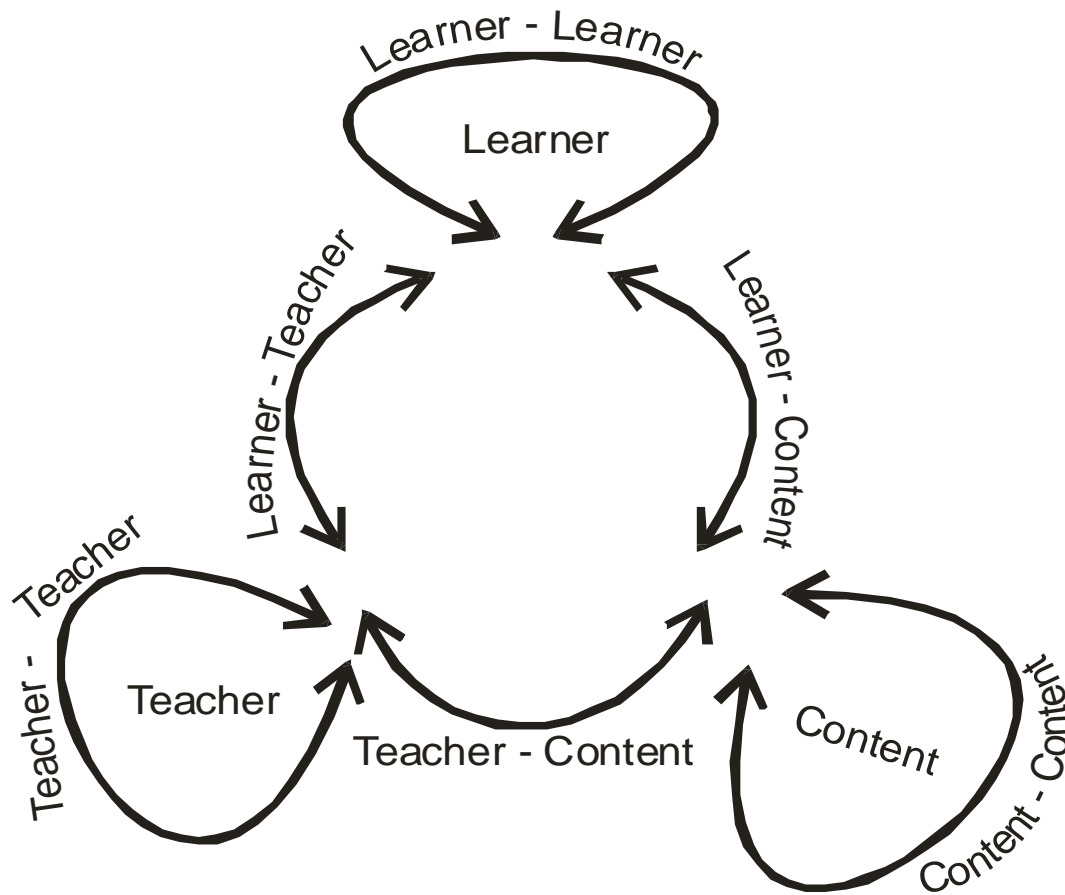
Areas of Interaction Application

Interaction can be delineated in terms of the actors participating in it.

Michael Moore, first discussed the three most common forms of interaction in distance education: Student – student, student - teacher, and student – content (Moore, 1989).

This list was expanded by Anderson and Garrison (1998) to include teacher – teacher, teacher – content and content – content interaction. Figure 3, illustrates these six types of educational interaction, and is designed briefly.

Figure 3



Student – Student Interaction

Traditionally, Student – Student Interaction has been down played as a requirement of distance education as a result of constraints on the availability of Technology and an earlier bias among distance education theorists toward individualized learning (Hdmsberg, 1989).

Modern Constructivist Theorists stress the value of peer – to peer interaction in investigating and developing multiple perspectives.

Work by Damon (1984) and others related to peer tutoring illustrates the benefits to both the tutor and the tutee that can result from a variety of forms of reciprocal teaching. Finally, peer interaction is critical to the development of communities of learning that allow learners to develop interpersonal skills, and to investigate tacit knowledge shared by community members as well as a formal curriculum of studies.

Student – Teacher Interaction

Student – teacher interaction is supported in on - line learning in a large number of varieties and formats that include asynchronous and synchronous communication using text, audio and video. The facilities such as communications lead many new teachers to be overwhelmed by the quantity of student. Communications and by the rise in students expectations for immediate response.

Student – Content Interaction

Student – Content interaction has always been a major component of formal education, even in the form of library study or the reading of text books in face – to – face instruction. The web supports these more passive forms of student – Content interaction, and also provides a host of new opportunities, including immersion in micro-environments, exercises in virtual labs, online computer – assisted tutorials, and the development of interactive content that responds to student behavior and attributes, often referred to as student models.

Teacher – Teacher Interaction

Teacher – teacher interaction creates the opportunity for professional development and support that sustains teachers through communities of like – minded colleagues. This interaction also encourages teachers to take advantage of knowledge growth and discovery in their own subject and within the scholarly community of teachers.

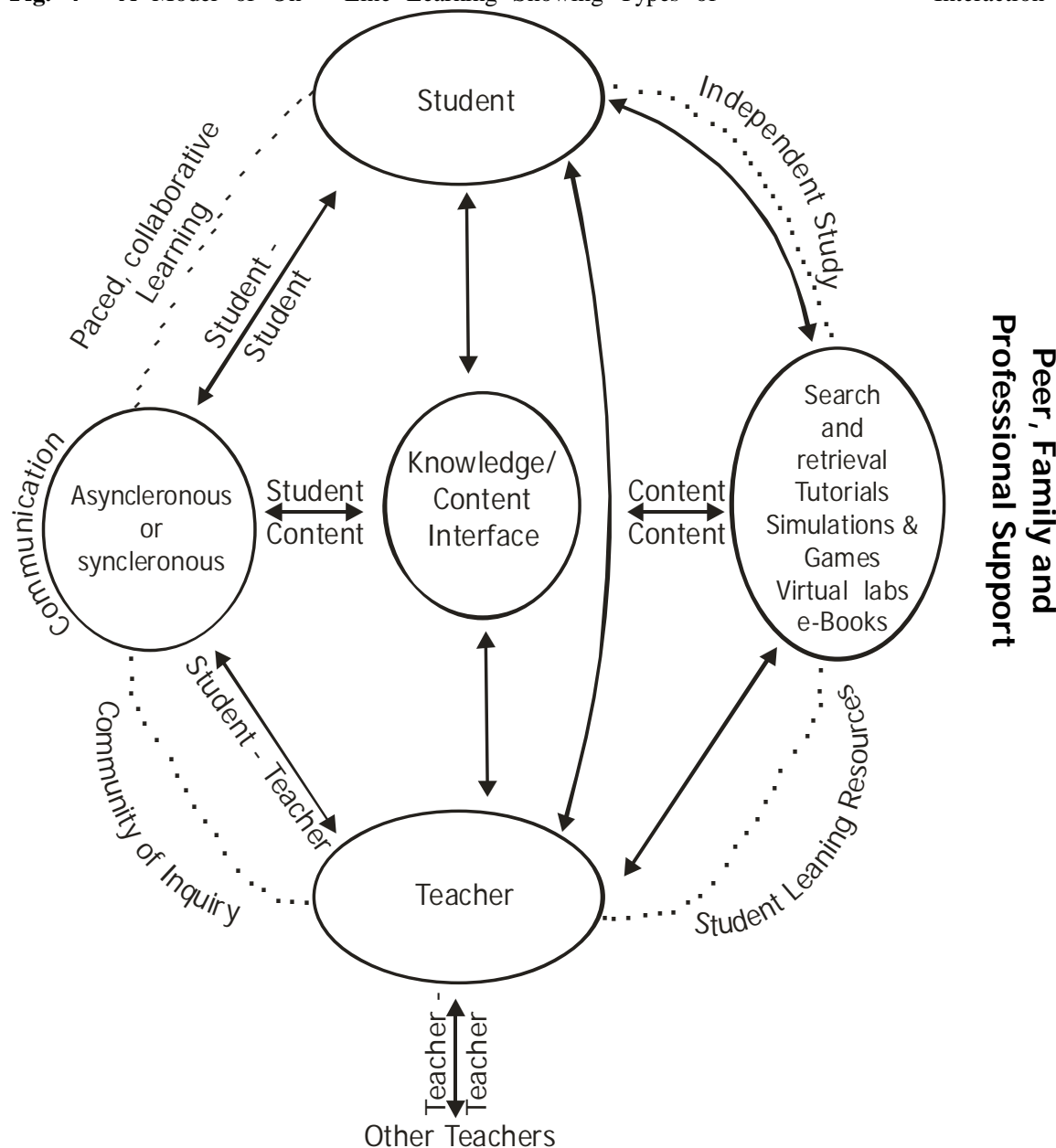
Teacher – Content Interaction

Teacher – Content focuses on the creation of content and learning activities by teachers. It allows teachers continuously to monitor and update the content resources and activities that they create for student learning.

Content – Content Interaction

It is a newly developing mode of educational interaction in which content is programmed to interact with other automated information sources, so as to refresh itself constantly, and to acquire new capabilities. For example a statistics tutorial might take its data from current mathematical servers, creating a learning context that is up-to-date and relevant to the learner’s context. Content – content interaction is also necessary to provide a means of asserting control of rights and facilitating tracking of the use of content by diverse groups of learners and teachers.

Figure 4, provides a model that illustrates the two human actors, learners and teachers, and their interactions with each other and with content. Learners can of course, interact directly with content that they find in multiple formats, and especially on the web. This interaction can take place within a community of inquiry, using a variety of new based synchronous and asynchronous activities (video, audio, computer, conferencing, chats or virtual world interaction). These environments are particularly rich, and allow for the learning of social skills, the collaborative learning of content, and the development of personal relationships among participants.



The second model of learning (on the right) illustrates The structured learning tools associated with independent learning. Common tools used in this model include computer assisted tutorials drills and simulations. Virtual labs, in which student complete simulations of library experiments and sophisticated search and retrieval tools are also becoming common instruments for individual learning.

Benefits of Interaction in On – Line Learning.

Increasingly, organizations are adopting online to train employees (Simmons, 2002). At the same time, educational institutions are moving toward the use of the internet for delivery, both on campus and at a distance. However, for organizations and institutions to make this often expensive move, there must be a perception that using online learning provides major benefits. Some of the benefits for learners and instructors are outline below:

Interaction in On-Line Learning: Issues, Benefits and Implications.

For learners, online learning knows no time zones, and location and distance are not an issue. In asynchronous online learning, students can access the online materials at anytime, while synchronous online learning allows for real time interaction between students and the instructor.

Learners can use the internet to access up – to – date and relevant learning materials, and can communicate with experts in the field in which they are studying. Situated learning is facilitated, since learners can complete online courses while working on the job or in their own space, and can contextualize the learning. For the instructor, tutoring can be done at anytime and from anywhere. Online materials can be updated, and learners are able to see the changes at once. When learners are able to access materials on the internet, it is easier for communication, it is easier for instructors to direct them to appropriate information based on their needs.

If designed properly, online learning systems can be used to determine learners needs and current level of expertise, and to assign appropriate materials for learners to select from in order to achieve the designed learning outcomes.

Conclusion

Increasing, Organizations are adopting online learning as the main delivery method to train employees. At the same time, educational institutions are moving toward the use of the internet for delivery, both on campus and at a distance.

Consequently, on – line learning should be given all the emphases that it deserves.

Implications/ Recommendation For On – line Learning

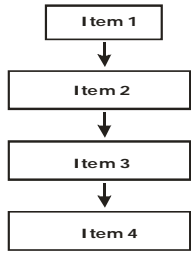
- (1) Learners should be told the explicit outcomes of the learning so that they can set expectations and can judge for themselves whether or not they have achieved the outcome of the online lesson.
- (2) Learners must be tested to determine whether or not they have achieved the learning outcome. Online testing or other forms of testing and assessment should be integrated into the learning sequence to check the learner’s achievement level and to provide appropriate feedback.
- (3) Learning materials must be sequenced appropriately to promote learning. The sequencing could take the form of simple to complex, known to unknown, and knowledge to application.
- (4) Learners must be provided with feedback so that they can monitor how they are doing and take corrective action if required.
- (5) Strategies should be used to allow learners to perceive and attend to the information so that it can be transferred to working memory. Learners use their sensory systems to register the information in the form of sensations. Strategies to facilitate maximum sensation should be used. Examples include the proper location of the information on the screen, the attributes of the screen (colour, graphics, size of text, etc), the pacing of the information, and the mode of delivery (audio, visuals, animations, video).

Learners must receive the Information in the form of sensations before perception and processing can occur; however, they must not be overloaded with sensations, which could be counterproductive to the learning process.

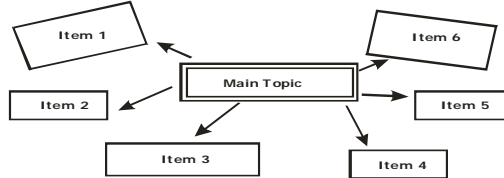
Non-essential sensations should be avoided to allow learners to attend to important information. Strategies to promote perception and attention for online learning include those listed below:

- Important information should be placed in the centre of the screen for reading, and learners must be able to read from left to right.
 - Information critical for learning should be highlighted to focus learner attention for example, in an online lesson, headings should be used to organize the details, and formatted to allow learners to attend to and process the information they contain.
 - Learners should be told why they should take the lesson ,so that they can attend to the information through out the lesson
 - The difficult level of the material must match the cognitive level of the learner, so that the learner can both attend to and relate to the material. Links to both simpler and more complicated materials can be used to accommodate learners at different knowledge levels.
- (6) Strategies should be used to allow learners to retrieve existing information from long-term memory to help make sense of the new information. Learners must construct a memory link between the new information and some related information already stored in long term memory. Strategies to facilitate the use of existing schema are listed below.
- Use advance organizers to activate an existing cognitive structure or to provide the information to incorporate the details of the lesson (Ausube, 1990). A comparative advance organizer can be used to recall prior knowledge to help in processing, and an expository advance organizer can be used to help incorporate the details of the lesson (Ally, 1980). Mayer 1979) conducted a meta-analysis of advance organizer studies, and found that these strategies are effective when students are learning from text that is presented in an unfamiliar form. Since most courses contain materials that are new to learners, advance organizers should be used to provide conceptual models that learners can use to retrieve existing mental models or to store the structure they will need to use to learn the details of the lesson.
 - Use pre-instructional questions to set expectations and to activate the learners existing knowledge structure. Questions presented before the lesson facilitate the recall of existing knowledge, and so help learners learn the materials and motivate them to find additional resources to achieve the lesson outcome.
 - Use prerequisite test questions to activate prerequisite test to activate prerequisite knowledge structure required for learning the new materials. With the flexibility of online learning, students with diverse backgrounds and knowledge can choose the most appropriate path to review previous or prerequisite learning before new information is presented.
- (7) Information should be checked to prevent overload during processing in working memory (Miller, 1956). Online learning materials should present between five and nine items on a screen to facilitate efficient processing in working memory. If there are many items in a lesson, the items should be organized in the form of information maps to show their organization. A generalized information map is provided as an overview for the online lesson, and can be linear, hierarchical, or spider – shaped, as illustrated in figures below (Smith and Ragan, 1999). As the lesson progresses, each item in the generalized information map is presented and broken down into sub-items. At the end of the lesson, the generalized map is shown again, but with the relationships among the items illustrated.

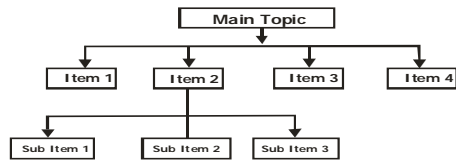
Linear Information Map



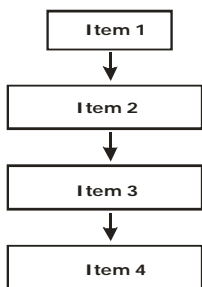
Spider - Shaped Information Map



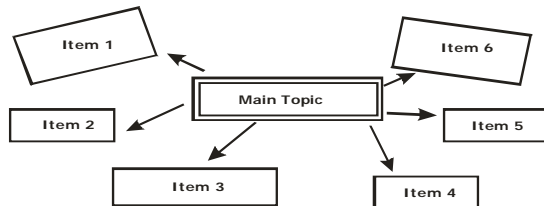
Hierarchical Information Map



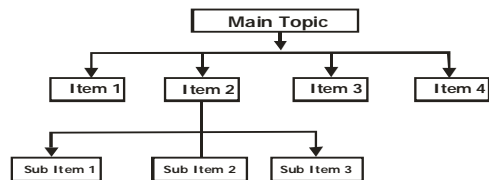
Linear Information Map



Spider - Shaped Information Map



Hierarchical Information Map



- (8) Adequate Supports should be provided for students with different learning styles. Alley and Faly (2002) found that students with different learning styles have different preferences for support. For examples, assimilators prefer high instructor presence, while accommodators prefer low instructor presence.
- (9) Information should be presented in different modes to accommodate individual differences in processing and to facilitate transfer to long – term memory. Where possible, textual, verbal, and visual information should be presented to encourage encoding. According to dual – coding theory (Paivio, 1986), information received in different modes (textual and visual) will be processed better than that presented in a single mode (textual only). Dual – Coded information is processed in different parts of the brain, resulting in more encoding.
- (10) Learners should be motivated to learn. It does not matter how effective the online materials are, if learners are not motivated, they will not learn, Designers of on – line learning materials should use intrinsic motivation strategies (Malone, 1981); however, extrinsic motivation should be used since some learners are motivated by externally driven methods. Keller proposed a model (ARCS – attention relevance confidence, satisfaction) for motivating learners during learning (Keller, 1983; Keller & Suzuki, 1988).

References

- Alley, F. E. & Fahy (2002). *Getting the mix right: An update and theoretical rationale for interaction*, ITFORUM, Paper 63, Retrieved June 6, 2010 from [http:// it. Coe.uga.edu/it forum/paper 63 htm](http://it.coe.uga.edu/itforum/paper63.htm)
- Ally, C. (1980). *Modes of Interaction In Distance Education*. Recent Developments and Research Questions.
- Damon, W. (1984). Peer interaction: The Untapped potential. *Journal of applied developmental psychology*, (5) 331 – 343.
- Garrison, Dr. & Shale, D. (1990). A new frame work and Perspective. In D. R. Garrison & D. Shale (Eds.), *Education at a distance: from Issues to practice* (pp. 123-133). Malabar, FL.
- Holmberg, B. (1989). *Theory and practice of distance education*. London: Reutledge.
- Keller, T. (1963). *Modeling Units of Study from a Pedagogical perspective: The pedagogical meta – model behind EML*. Retrieved June 6, 2010 from the open University of Netherland web site: [HTTP://EMLS oi.u.nl/introduction/dpcs/ped-meta model. pdf](HTTP://EMLS.oiu.nl/introduction/dpcs/ped-meta.model.pdf).
- Keller, F. & Suzuki, A. (1988) *Directory of scholarly and professional e-conferences*. Retrieved July 17, 2011 from <http://www.kovacs.com/directory>.
- Laurillard, D. (1997). *Rethinking University teaching: A framework for the effective use of educational technology*. London: Routledge.
- Manson, J. & Hart, G. (1997). *Effective use of asynchronous virtual learning communities*, Retrieved June 6, 2011 from [htt://www.arch.syd.edu.au/kcdc/conferences/vc97/papers/mason.html](http://www.arch.syd.edu.au/kcdc/conferences/vc97/papers/mason.html).
- Malone, C. (1981). *Teaching Critical Thinking*. New York: Routledge.
- Moore, M. (1989). Three types of interaction. *American Journal of Distance Education*, 3 (2), 1 – 6.

Interaction in On-Line Learning: Issues, Benefits and Implications.

Paivio, J. (1986). *Digital Game – Based Learning*. New York: McGraw –Hill.

Sims, R. (1999). Interactivity on Stage: strategies for learner – designer communication. *Australian Journal of Educational Technology*, 15 (3),257 -272. Retrieved June 6, 2011, from <http://www.ascillite.org.au/ajet/ajet 15/sims.html>.

Wenger, E. (2001). *Supporting communities of practice: A survey of community – oriented technologies*. Retrieved June 6 2010, from http://www.ewenger.com/tech_