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Web-Based Instruction and the Traditional Classroom: Similarities and Differences

Anju Relan and Bijan B . Gillani

In recent times, " traditional instruction" has been considered a major cause of a dysfunctional and even an obsolete educational system (Banathy, 1994; Reigeluth, 1994). Such criticisms have escalated as multimedia and telecommunications technologies continue to evolve and advance, with promises of providing the learner with a richer, more meaningful education relevant for the future workplace and learning environments. Amidst this technological revolution, a new medium has emerged: the World Wide Web, which continues to grow at an unprecedented pace, captivating both young and adult users. In educational literature, the term "Web-based instruction" has seen frequent usage, and on account of its novelty, is interpreted broadly as any form of instructional delivery in which the World Wide Web is included as a tool. In a similar vein, "traditional instruction," in lay terms, is viewed as an instructional environment which, among other characteristics, encourages passive learning, ignores the individual needs of students, and underserves the development of problem solving and other higher order intellectual skills (Hansom & Briggs, 1982).

"Web-based instruction" and "traditional" approaches to instruction are usually juxtaposed to highlight their seemingly inherent incompatibilities. The intent of this chapter is to elaborate upon the two pedagogical environments and highlight their differences and similarities via a discussion of instructional strategies practiced in each.

Traditional Instruction

In a systematic study and analysis of classroom practices continuing over a century, Cuban (1993) describes classroom instruction as a model stretching from a teacher centered to student centered curriculum. The author observes that in a teacher centered curriculum:

a.   teacher talk exceeds student talk;

b.   instruction occurs frequently with the whole class; small group or individual instruction occurs less often;

c.   use of class time is largely determined by the teacher;

d.   teachers look upon the textbook to guide curricular and instructional decision making; and

e.   classroom furniture is arranged into rows of desks or chairs facing a chalkboard.

In a student centered curriculum, on the other hand, "students exercise a substantial degree of responsibility for what is taught, how it is learned, and for movement within a classroom" (Cuban, 1993, p. 7). Thus, at this end of the spectrum of classroom practices:

a.   student talk is equal or greater than teacher talk;

b.   most instruction occurs in small groups;

c.   students help choose the content to be organized and learned;

d.   teachers permit students to determine partially or completely the rules of behavior, classroom rewards and punishment;

e.   varied instructional materials are used independently or in small groups determined by the group or the individual; and

f.   furniture is arranged so that students can work in groups or individually.

Cuban proposes that the teacher centered model was in place by 1916 in most schools, with traces of the student centered curriculum evident in smaller and private schools. In spite of several pedagogical shifts and criticisms levelled against formal education in the last five decades, Cuban concludes that, "there has yet been no clustering of research findings or written observations to challenge the picture of the enduring dominance of a teacher centered curriculum ..." (p. 235).

We consider the criteria that Cuban uses above to describe even student centered instruction as epitomizing the essential elements of "traditional instruction." To the criteria proposed by him, we would add the following to construct an interpretation:

a.   Spatial and temporal structures that learners must adhere to in the learning process are firmly in place. Generally, learning 's geographically compartmentalized-physical s aces are assigned for the purpose of learning: the classroom, the lab, and playground, field trips. The compartmentalization of the learning space is extended to a temporal and sequential structure, e.g., disciplines are taught within designated time slots, in a fixed sequence.

b.   Physical presence of the student and teacher in a classroom is a requirement for learning to occur, in spite of the relatively brief interaction that occurs between a student and the teacher during a regular school day.

During his research on effective schools, Goodlad (1984) described a typical scenario which explicates what we consider as "traditional classroom instruction":

Not "how" but "what' to learn dominated consistently. Teachers and children were busy covering' what was set forth in the textbooks and workbooks. Children, either as individuals or in groups, were not seeking solutions to problems identified by them as important and meaningful. instead, they were moderately busy on assignments predetermined by teachers. In general, the subject matter studied appeared to be remote from daily concerns and interests of the children ... While the children were not bubbling with excitement, they appeared not to be completely bored either. (pp. 13-14)

Why is "traditional instruction" largely devoid of cognitively powerful instructional strategies? Cuban (1993) asserts that many effective classroom practices are difficult to integrate and implement within the structural frameworks in which "traditional instruction" occurs, and are the cause of the stability of traditional classroom practices. These include the arrangement of school space, organization of content and students into grade levels, fifty minute periods, and large classrooms. In the following section, we propose that the repertoire of effective methods is vastly improved via effective use of the World Wide Web in instructional delivery (namely, via Web-based instruction). The Attributes of the World Wide Web have the capability of enabling teachers to design innovative instruction in spite of seemingly immutable structures in place.

Web-Based Instruction

We define WBI as the application of a repertoire of cognitively oriented instructional strategies implemented within a constructivist (Lebow, 1993; Perkins, 1991) and collaborative learning environment, utilizing the Attributes and resources of the World Wide Web. The instructional strategies may be designed using the World Wide Web in any of the following ways:

- as a resource for the identification, evaluation, and integration of a variety of information;

- as a medium of collaboration, conversation, discussions, exchange, and communication of ideas;

- as an international platform for the expression and contribution of artistic and cognitive understandings and meanings; and

- as a medium for participating in simulated experiences apprenticeships, and cognitive partnerships

Just as traditional instruction (whether teacher centered or student centered) is executed within the structural patterns which are in place, WBI is situated within different contextual assumptions. First, it is assumed that the learner has access to the World Wide Web at all times, and is allowed to explore it in a self-determined or guided sequence. Second, WBI would function best in a constructivist environment, indeed; the use of the medium in any other way would defeat its purpose in the instructional process. Third, the teacher "dethrones" him/herself as the disseminator of Information, and becomes a facilitator for finding, assessing, and making meanings from the information discovered from a variety of media. Fourth, learning occurs in an interdisciplinary fashion without regard to the attainment of learning objectives within a fixed time.

Given the above set of assumptions, we provide some examples of the kinds of projects WBI might include, while contrasting it with traditional instruction, and conclude with a set of generalities based on the strategies used in the examples.

1. Traditional classrooms are space bound; learning occurs within a physical boundary-for example, a classroom, a school, field trips, and various other locations. WBI extends the boundaries of learning, so that it can occur in the classroom, from home, and in the workplace. Having permanent access to a multitude of learning resources regardless of one's geographical location allows continuity in learning and encourages uninterrupted reflection about a topic, and revision of one's thesis. As an example, Susan's sixth grade has begun a project exploring the issues surrounding air quality and its effect on people. In class she worked on exploring the chemical pollutants released by the automobile. While walking home, she is struck by the layer of smog in the horizon. Curious to find out what it is composed of, she reaches home, logs on to the World Wide Web, and conducts a search on smog, air pollution, and the long term effects on population. The resources she finds are from major universities, environmental groups, agencies, and newspapers located all over the world. She skims through the resources, selects some to read, creates bookmarks of the ones she would like to share in class, and goes back to school the following day with a self-generated hypothesis on how the problem of air pollution can be resolved locally.

2. WBI may be employed to promote experiential learning, or learning "on site," so that the process of learning is integrated with the real world. Several expeditions by scientists and professionals have elicited student participation from schools. Students vicariously experience the excursion/expedition via photographs, activity logs, interaction with participants, and classroom activities based on the topic. As an example: Excerpt taken from GlobaLearn (http://www.globalearn.org):

   In March, 1996, students all over the country will log onto the Internet, direct a live expedition and help unravel one of the greatest mysteries of all time. Their teachers, for the first time, will put away textbooks and use a learning adventure to satisfy curriculum requirements. MayaQuest is a two-part, kid-directed

expedition led by adventurer Dan Buettner. Its goal is to engage an online audience to help explain 9th century collapse of the ancient Maya civilization. Last spring, some 40,000 teachers used the program in their classrooms. During February the MayaQuest team cycled through Central America carrying laptop computers, a satellite dish and a connection to the Internet. Kids and online explorers voted on team decisions, explored 21 Maya sites and were virtually on hand for several major discoveries. Then these kids actually helped archaeologists answer questions.

3. WBI offers a new sensibility and means of social interaction engineered towards learning. Cooperative learning as an effective learning strategy has been studied and practiced extensively Johnson & Johnson, 1990). With WBI, cooperative learning extends beyond one classroom to potentially every classroom that is connected to the Internet! Students have the Potential of discussing, problem solving, querying their own peers as well as knowledgeable adults in a particular field. For example, during the MayaQuest expedition (http://www.mayaquest.mecc.com), students are able to ask questions of expert archeologists, as well as cooperatively solve problems posed by project coordinators. While traditional instruction tends to discourage social interaction, WBI is designed for collaboration and interaction which can be effectively employed towards learning. This type of social interaction fosters a different sense of accountability among students.

4. The predominant source of content shifts from the textbook and the teacher to a more varied source of information. Further, the nature of content becomes dynamic, versus the static texts published on a certain date. Students who have performed extensive research on topics may also contribute to the content on the topic. Finally, the impact of such a diverse resource of content cannot be overlooked in its ability to prod the learner to use highly developed metacognitive skills to glean, review, assess, select, and integrate this content meaningfully, with the facility of collaborative discourse, synchronous or asynchronous, simultaneously available on the World Wide Web.

5. A noteworthy Attribute of the World Wide Web is the presentation of content in a hypertext format, which allows the user to pursue a sequence of content entirely based on his/her volition. This presents a colossal shift to the student in gaining a control of learning which is characteristically absent from a traditional classroom. The cognitive advantages of hypermedia have been discussed extensively elsewhere (e.g., Jonassen, Myers, & McKillop). WBI not only allows the learner to partake of the infinite content available on the World Wide Web, but also to contribute to it and represent his or her own understandings and meanings in hypermedia formats. One can find numerous examples of student projects on school Web pages across the curriculum (for examples, see http://www.classroom.net)

6. The World Wide Web is increasingly promoting the concept of distance education, which has thus far been a cumbersome and expensive process. Numerous courses are offered remotely, where the learner enjoys the flexibility of time and content, and is able to obtain individualized feedback on assignments. The ability of the instructor and students to communicate privately or collectively in a synchronous or asynchronous manner lends a new dimension to the design of instructional strategies.

7. Individualization and student choice also acquire a different set of dimensions with the World Wide Web. Students have a choice of content, time, resources, feedback, and a variety of media for expressing their understandings. For example, while content was designated by the instructor from a textbook and library media in traditional instruction, it acquires a different meaning on the World Wide Web. Content can be information as well as the interpretations of information by experts, novices, and students. It can be in the form of research reports, arguments, journalistic accounts, and essays. Content is not only represented through text and graphics, but in any multimedia format. Similarly, feedback is not restricted to that of the instructor, but includes collegial responses from learners in various geographical locations.

Web-Based Instruction, Traditional Instruction, and Changing Conceptions of Learning

The traditional approaches of learning have lately been questioned in their ability to provide the learner with "rich" rather than "minimalist" environments (Perkins, 1996), and with "authentic" experiences of learning which are meaningful to the learner in some intrinsic manner.

These notions have led educators of think of learning as being "situated" (Brown, Collins, & Duguid, 1989); for example, "...knowledge is no longer simply an individual acquisition, but resides also in groups or communities that share a situatedness" (Damarin, 1983, p. 27). The World Wide Web enables an environment in which such "learning communities" (Lin *et al.,* 1996) can be created, and rich, authentic experiences provided. Just as the application of hypertext and hypermedia created novel modes of learning and contributed to the restructuring of an instructional environment (e.g., the creation of constructivist ways of learning), the World Wide Web has the power to generate novel learning strategies which will eventually be embedded in cognitive, social, and cultural contexts.

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