

# Can We Address Learning Styles of Students in Traditional And Web-Based Courses: Perceptions of Faculty Members and Preservice Teachers

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## Abstract

The present study explored faculty members' and preservice teachers' perceptions on addressing learning styles in different instructional environments, namely in traditional classroom and web-based instruction. This study used data from faculty members and preservice teachers at a state university in Turkey. This study reports both faculty members' and preservice teachers' perceptions on considering individual differences while designing a course for both traditional setting and web-based instruction.

## Introduction

In our daily teaching practices, we observe that some students can learn easier than others and therefore they perform better on tests. This fact underlines the principle that instructional, contextual, and individual characteristics come into play during learning. In their study, Jonassen and Grabowski (1993) point out the importance of a similar principle by advocating, "student learning differs because student learning traits differ, and because the thinking process differs depending on what the student is trying to learn." (p. 3).

If the learning traits, aptitudes for learning, willingness to learn and preferences for processing information differ dramatically, we need to recognize the need for alternative design approaches that address these differences.

Consequently, the instructional design approach is of a great value for providing learners with opportunities to learn better and effectively.

## Background of the Problem

Since the advancement of technology in education, World Wide Web (WWW) has become one of the most popular tools for delivering instruction over the Internet. Such capabilities of the Web as handling text and picture as well as audio and video, promoted itself as a powerful tool for delivering instruction.

Although there is a number of instructional design models that propose prescriptive approaches for Web-based instruction, only a few considers individual learning differences at appropriate level. Therefore, there exists a need for an alternative design model that conveys and considers such characteristics as learning differences, learning goals and objectives, content, user interface and so on that have a tremendous effect in web environment.

## Purpose of the Study

Web-based instruction has been commonly used in distance education, especially as a supplementary delivery method for instruction for traditional courses. Hence, there is a lack of contemporary instructional design approach that fully addresses learning styles of individuals.

Learning style is not fixed to an individual, a situation or a task; it can vary by time, motivation, and learner's psychology or by other conditions of learners. Being aware of individual differences, it is

important to continuously evaluate all aspects of Web-based teaching and learning if the promise of Web-based instruction is to be fulfilled. Therefore, designing a web-based instruction by considering all variables of the instructional environment would result in more effective instruction.

The purpose of this study is to examine the perceptions of faculty members and 4th year preservice teachers of Computer Education and Instructional Technology department in a state university of Turkey. This study examined participants' perceptions and their preferences of learning styles in both traditional and web-based instruction.

#### **Research Context:**

The learning styles theory was championed by Carl Jung, who is usually credited with first defining learning style theory. Myers and Briggs have also applied Jung's work and this work lead to a new field, understanding the differences in learning, for researchers (as cited in Silver and Strong, 1997).

The learning styles theory implies that individuals have different ways of perception, and one style doesn't represents all the individuals. So, instruction must be presented in different ways respecting these differences.

In their study of the effect of end user learning style and method of instruction on end user learning outcomes, Bohlen and Ferratt (1993) concluded, "... the method of instruction alone and in combination with learning style makes a difference in some, but not all measures of achievement, efficiency and satisfaction" (p. 280-81).

In the study conducted by Bostrom, Olfman and Sein (1988), the importance of individual differences in end-user training has been criticized from the learning styles point of view. The findings of this study suggested, "...in the design of training, it is essential to match training methods to individual difference variables" (p. 133).

Another study by Chuang (1999) investigated the presentation effects of text, oral narration, and computer animation implemented in an instructional lesson, and individual differences, which affect students' learning in a multimedia computer environment. Chuang (1999) concluded that "subjects performed significantly better on the posttest in the animation+text+voice version, which was also the favorite interface design chosen by most of the subjects".

Assuming that technology is most effectively used in the classroom when students use technology as a cognitive tool, Cohen (1997) conducted a research about learning style in a technology-rich environment and concluded, "a technology-rich environment impacts the written and unwritten curriculum of a school. Schools should be sensitive to students' learning styles when adopting an instructional methodology that will be used extensively throughout the curriculum".

In their studies Gilbert and Han (1999) stated, "an approach to achieve "A Significant Difference" is to provide several different instruction methods". (p. 433) So, they have developed a Web-based instruction system they called as "Arthur" which provides adaptive instruction. As an opposite view to traditional system, which defines one-to-many presentation of the lecture, this system takes several different styles of instruction from several different instructors and makes them available to each learner, which defines a many-to-one relationship. Here the web-based instruction is presented to the student by using different methods like audio, visual and text, which is expected to result in accommodating individual learning styles.

Contradictory to the findings of previous studies, Shih and Gamon (1999) found that "student learning styles and student characteristics did not have an effect on their Web-based learning achievement". They also concluded that "students with different learning styles and backgrounds learned equally well in Web-based courses and learning styles did not affect student motivation and use of learning strategies" and that "motivation and learning strategies seemed to be the most important factors in Web-based learning".

Snyder (2000) developed an instrument that teachers could easily administer to their classes to learn more about the learning needs of their students and by using this tool she investigated the relationships between academic achievement and the learning styles/multiple intelligences in her study. The results of this study showed that "many relationships emerged as being dependent" and the researcher concluded, "to be successful in our classrooms, we need to be more aware of how our students learn".

#### **Research Questions:**

This research particularly focused on the following main research questions:

1. What are the perceptions of faculty members on addressing learning styles in different instructional environments (traditional vs. web-based)?

2. What are the perceptions of 4th year preservice teachers in terms of considering learning styles in different learning environments (traditional vs. web-based)?

#### **Research Methods:**

This study used qualitative research methods for two specific reasons. First, qualitative research is an adequate method for disclosing underlying attitudes, thoughts, and perceptions when the literature suffers from lack of research on the phenomenon (learning styles and web-based instruction, which this study investigates). Second, a detailed description about the research content is needed in order to provide a complete and revealing picture to see what is going on. That's why, this study is a 'case study' since the participants were selected from only one department at a state university and it is needed to present a holistic portrayal of the phenomenon (Patton, 1987).

#### **Subjects**

The subjects of this study included 3 faculty members and 13 preservice teachers of department of Computer Education and Instructional Technology (CEIT) at a state university. Since main concern of this study is to understand the phenomenon about the consideration of learning styles in traditional and Web-based instruction, we have to explore the phenomenon from multiple perspectives. To attain this goal, the subjects of this study were selected from Computer Education and Instructional Technology (CEIT) Department keeping these two issues in the mind;

1. The department is the one, which uses Web-based instruction most frequently as a supplementary to traditional courses among the departments of faculty of education in one State University,
2. For its accessibility.

#### **Data Sources**

This study extracted data from the following main sources:

1. Three faculty members
2. Thirteen preservice teachers
3. Document Analysis

Structured interviews were conducted with Faculty members of CEIT in order to understand their perceptions. These interviews were conducted according to a 'interview guide' which was developed and pilot tested by the researchers. All of the interviews were tape-recorded with the consent of the participants. Preservice teachers were asked to fill out a 'questionnaire' in order to access a wider population. This questionnaire had parallel questions with the interview guide developed for the faculty members. The questionnaire was prepared and pilot tested by the researchers in order to ensure its validity.

To obtain a more detailed vision of the preservice teachers towards the topic, a structured interview guide is prepared for preservice teachers including parallel questions with the questionnaire. For the recording of interviews, a tape recorder was used.

Finally, as the document analysis part of the study, the researchers did a comprehensive literature review.

#### **Procedures**

In this study, data was collected in the following manner:

1. Structured interviews were held with 3 faculty members.
2. Open-ended questionnaire was administered to all preservice teachers (totally 49 students of 4th year) of Computer Education and Instructional Technology Department. Of 20 students volunteered to participate the study.
3. After the analysis of results of previous step, 13 students were selected out of 20, in order to conduct more in-depth interviews. 3 focus group interviews were held with 4 students in two groups and 5 students in one group respectively.

#### **Data Analysis:**

The results obtained from interviews and questionnaire were analyzed, in order to explore faculty members' and preservice teachers' perceptions.

The data collected were analyzed inductively after the collection period is completed. The analyses were triangulated in terms of sources of data. According to Maxwell (1996), triangulation "reduces the risk of chance associations and of systematic biases due to a specific method and allows a better assessment of the

generality of the explanations that you develop” (p. 93). Furthermore, other researchers validated each interview transcript and interpretation.

Multiple perspectives will yield people approaching situations from different point of views. Therefore, it is important for the reader to see the case from multiple perspectives and think about or judge the case by his/her own ideas.

The results obtained from interviews were analyzed separately, in order to understand faculty members’ and preservice teachers’ perceptions. Interview data were transcribed precisely and coded inductively. The similar patterns and/or themes were outlined. After creating coding categories for the analyzed data, coding of the data was repeated according to these coding categories. Finally, the results were reported both from the views of faculty members and preservice teachers, separately.

### **Findings:**

Throughout this section, illustrative opinions of faculty members and preservice teachers from structured interviews highlights the results.

#### ***Faculty members:***

##### *Theme 1: Faculty Members’ Perceptions on learning styles in traditional learning environments:*

All faculty members agreed that every student has different characteristics and talent. Every student has individual preferences coincided with their learning process. Two faculty members provided a definition for learning styles that parallels with learning theories. They also advocated that differences in learning styles could especially be tracked down by observing one’s study habits or behaviors in the learning environment. When faculty members were asked about how they determine their teaching style, they all stated that such decision mainly relies on the content to be taught.

##### *Theme 2: Perceptions of faculty members on instructional materials and strategies used in the classroom:*

All faculty members reported that preferring certain teaching strategies in the classroom requires utilization of variety of teaching materials and learning tasks. Additionally, all faculty members reported that if one intends to accommodate students’ learning styles in the classroom, s/he has to utilize a number of appropriate teaching strategies and techniques as possible.

##### *Theme 3: Faculty members’ perceptions on learning styles in web-based instruction:*

Faculty members stated the lack of “face-to-face interaction” and “presence of immediate feedback” on the web as the most distracting feature for instruction. They also recognized the inefficiency of interactivity among all parties on the web. They also mentioned the value of utilizing all possible cognitive tools while designing a web-based instruction in order to address students’ varying learning styles.

##### *Theme 4: Perceptions of faculty members for addressing different learning styles in a web-based instruction:*

Faculty members stated that the most important issue in addressing learning strategies in a web-based instruction is to consider such learning theories as cognitivism and constructivism. According to the faculty members, designing an instruction on the web is a dynamic process and this dynamism should be conveyed by the feedback provided by students.

#### ***Preservice Teachers:***

##### *Theme 1: Preservice teachers’ opinions about their learning preferences in traditional learning environments:*

The most common learning preferences of students in traditional classrooms could be classified from most used one to least used as; note taking, asking questions and listening to the instructor, discussion, learning in cooperative groups, reading course material and individual study.

*Theme 2: Perceptions of preservice teachers about instructional strategies used in the classroom:*

The most preferred instructional strategy by preservice teachers was "discussion". Learning by doing, project-based learning, cooperative learning, questioning, discovery learning and problem solving were the other strategies favored by preservice teachers respectively. All preservice teachers also addressed that they have to be an active participants of the learning environment. Unlike other focus groups, one of the groups reported that they prefer a mix of different learning methods, and learning environment must be a representative of real life cases. Surprisingly, 14 students out of 20 ranked books as the most favored medium of instruction.

*Theme 3: Preservice teachers' perceptions about web-based instruction and their learning preferences:*

All groups agreed that a web-based instruction should offer texts in different formats such as html, word, pdf and so on. They also reported that they should be able get print out of those pages whenever needed. Using different types of media such as audio, visuals, video and so on are also preferred in a web-based instruction by the preservice teachers if those features are available whenever they want.

*Theme 4: Preservice teachers' perceptions about how to adopt their learning preferences to a web-based instruction:*

Preservice teachers' responses to this question varied. For example, two of the groups addressed that web-based assessment is less valid than traditional assessment in terms of authenticity of student responses on a test and other security issues regarding to access. They also advocated that web-based instruction limits social interaction among the participants. Of 2 focus groups addressed that the sequence of instruction should be in accordance with their performance and learning pace. Navigation structure of the web-based instruction is another important future that preservice teachers emphasized. Finally, they reported that web-based instruction is more suitable for adult learners.

## **Discussion and Conclusion**

The purpose of this study was to examine participants' perceptions and their preferences of learning styles in traditional and Web-based instruction. Sixteen participants (3 faculty members, 13 preservice teachers) were the main focus of this study.

One of the most important findings of this study is that all faculty members recognize the importance of utilization of a number of teaching materials and learning activities in favoring certain teaching strategies for effective instruction. They also underlined the necessity for adopting appropriate and a variety of teaching strategies and techniques as possible to address students' differing learning styles in the class. On the other hand, faculty members considered web-based instruction as a weak format for presenting content in terms of its inadequacy in providing face-to-face interaction and immediate feedback. Therefore, they suggested that all possible cognitive tools should be integrated into web-based instruction to overcome such obstacles. This finding parallels with the related literature as well (Yildirim & Kiraz, 1999). Finally, faculty members reported that web-based instruction should provide adaptive instruction to address students' differing learning styles. Brusilovsky and his associates (1999) also reported similar concerns; "To support the student navigation through the course, the system uses adaptive annotation. . ." (p. 257).

When preservice teacher were asked to identify their preferences of learning strategies in traditional classroom settings, they reported "note-taking, questioning, discussion, and learning in cooperative groups" as the most preferred strategies. Preservice teachers also favored learning by doing, problem solving and problem-based learning for effective learning. Surprisingly, most preservice teachers ranked books as the most preferred medium of instruction, yet they were majoring in computer education and were advanced on using computers. Similar to faculty members, preservice teachers also advocated that different type and format of presentation should be present on the web. They also stated that active participation is a key activity to learn effectively and different formats and medium of presentation on the web should have them actively participate in instruction. In conjunction with the faculty members' perceptions, preservice teachers also stated that web-based instruction should provide instruction in accordance with their learning pace and performance. Additionally, they underlined the importance of navigation structure on a web-

based instruction. Finally, in contrast to faculty members' perceptions, preservice teachers viewed web-based instruction as more suitable for adult learners.

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