Learning Preferences and Learning Styles of Online Adult Learners

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Learning preferences and learning styles are a way to enhance the quality of learning, especially for those who are alone in front of a computer, i.e., online students. Any student can adapt learning processes, activities and techniques, if he/she is able to understand his/her own personal characteristics and the consequences of possible different experiences. In order to help students to learn better, instructors should provide an easy way for them to make discoveries about themselves. Thus, the aim of this chapter is “to reveal possible learning preferences and learning styles of students in online environments” and “to provide sample ideas for e-instructors” to address these diverse learners. For this purpose, qualitative research methods will be used. The literature will be reviewed and students will be posed several open-ended questions about their learning preferences. Based on the findings, learning preferences and learning styles will be grouped in a general way, and e-instructors provided with examples of instructional media, materials and methods.

Keywords learning preferences, learning styles, e-learning, online instruction

1. Introduction

E-learning tools and techniques have dramatically changed the higher education process in recent years. As reiterated by Paechter and Maier (2010), “Over the past few years, digital media have enriched the teaching and learning experiences and have become commonplace with university students and lecturers.” (p. 292). Although the applications of e-learning at universities have increased rapidly, little is known about learners’ preferences and styles in online environments. Do any adult learning styles or preferences for a face-to-face environment carry over into an online environment? This chapter is written in order to shed light on this question in depth. The need for research on this phenomenon is also underlined by Zheng, Flygare and Dahl (2009) who stated, “The increasing application of web technology has demanded that an understanding must be made in regard to learners’ cognitive styles and their interaction with different instructional strategies in online learning.” (p. 222). Thus, the design, development and management of online instructional programs are of critical importance, since our main purpose is to present learners with effective and efficient environment that enhances learning.

As we are all aware, “There is no one preferred learning style that works for all students or even for any one particular ethnic or cultural group” (Arp & Woodard, 2006). Every student learns in her/his own way, which has popularized the approach of “personalized learning” in recent years. Hence, personalization of learning means dealing with adults’ learning preferences, learning styles and the behaviors. Instructors are therefore facing difficulties while transferring their know-how and valuable experiences from traditional environments to online environments. One of the main difficulties in this transfer process is recognizing the individual differences among learners. Therefore, identifying learning styles is a critical step in understanding how to improve the learning process (Hamada, Rashad & Darwesh, 2011).

Research has shown that if the instruction is delivered in the preferred styles of a student, an increase in motivation and achievement can be observed (Fahy & Ally 2005; Manochehri & Young, 2006; Bezalel & Barth, 2007). Since there is a probability of increasing success in the performance, “... students should have an opportunity to better understand their own learning styles and accordingly what kind of curriculum delivery best fits their style.” (Rogers & McNeil, 2009, p. 10). There are many research studies which take into account learning styles in e-learning settings, “But while they have pointed to possible associations between style and ICT use, they have not explored the nature of the interaction between learning style and ICT use.” (Heaton-Shrestha, Gipps, Edirisimga & Linsey, 2007, p. 443). In fact, there is a real need to explore the effects of considering e-learning styles in depth when considering different variables in online environments.

2. So what are Learning Preferences and Learning Styles?

Learning styles have really gained so much attention in recent years across different age groups and learning environments. Rayner (2006) also underlines this fact: ‘a heady mix of metaphor, sound bites and polemic … an academic and political debate in which far more heat than light is generated’ (p. 5). Thus, “The area of learning styles is complex and many questions are still open, including a clear definition of learning styles, a comprehensive model which describes the most important learning style preferences, and the question about the stability of learning styles” (Kinshuk, Liu & Graf, 2009, p. 740). As stated by Felder and Silverman (1988), grouping students according to a
number of scales pertaining to the ways they receive and process information is defined as a learning style model. Similarly, according to Jonassen and Grabowski (1993), learning styles are tendencies for the preference to process information in certain ways. In another definition, a learning style can be described as the composite of cognitive, affective, and psychological characteristics that serve as an indicator of how an individual interacts with and respond to the learning environment (Keefe, 1979; Duff, 2000). In other words, learning styles can be described as the means of perceiving, processing, storing, and recalling attempts in the learning process (James & Gardner, 1995). Various cognitive and learning style theories and models have been proposed over the course of many years, identifying and categorizing students’ individual differences like Hill’s Cognitive Style Mapping (1976), Dunn and Dunn Learning Styles (1978), Howard Gardner’s Multiple Intelligence Theory (1983), Kolb’s Learning Styles (1984), Gregorc Learning Styles (1985), Felder-Silverman Learning Model (1988), Grasha-Reichmann Learning Style Scales (1996), and Hermann Brain Dominance Models (1996). These models of learning styles are currently being used to assess how students learn.

According to Kolb (1984), individuals learn in four stages or modes: Concrete Experience (CE, e.g. laboratories, field work, observations), Reflective Observation (RO, e.g. journals, logs, brainstorming), Abstract Conceptualization (AC, e.g. papers, lectures, analogies), and Active Experimentation (AE, e.g. simulations, case study, homework). However, the process of constructing knowledge in different learning situations involves a creative combination of the four learning modes that is responsive to contextual demands. The combination of learning modes used to establish the four quadrants reflect the four learning styles: Accommodators (favored CE and AE, i.e. feeling and doing), Divergers (favored CE and RO, i.e. feeling and watching), Assimilators (favored AC and RO, i.e. thinking and watching), and Convergers (favored AC and AE, i.e. thinking and doing).

The Grasha-Reichmann Learning Style Scale is a 60-item self-evaluation inventory that utilizes a five point Likert scale and represents six learning styles (1996). This inventory assessed the learning styles of college students through a social, affective perspective on the different ways individuals approach the classroom environment (Keefe, 1979). The Gregorc learning style is based on a bidimensional level between perception and ordering. Perceptual preference refers to acquisition in either an abstract or concrete manner, or in some combination. Abstract perception refers to the ability to process information through reason and intuition, often invisible to our physical senses. Concrete perception refers to the ability to process the physical aspects of information through the senses (Jonassen & Grabowski, 1993). The Index of Learning Styles (ILS) (Felder & Soloman 1991) is a 44-question survey based on a learning style model formulated in 1988 by Richard M. Felder and Linda K. Silverman. It was further developed by Richard M. Felder and Barbara A. Soloman in 1991. Of the eight dimensions defined by the index, four of them appear to describe learning styles that are reflective, intuitive, verbal, and global.

Given the above-mentioned list of assumptions derived from the literature, one of the most popular models for learning styles is the Felder-Silverman Dimensions of Learning Style model. Felder and Silverman developed their learning style model based on a composite of several theories (e.g., Jung’s theory of psychological types, information processing). The model combines several dimensions presented in the Myers-Briggs model (Sensing/Intuitive) with Kolb’s information processing dimension (Active/Reflective). It also avoids the complexity of the Dunn and Dunn model (Moallem, 2007). Nevertheless, the most common classifications of learning styles in the field is Witkin’s cognitive style field dependence and independence model and Kolb’s learning style model that classified individuals’ learning profiles as accommodator, diverger, converger, and assimilator (Desmedt & Valcke, 2004).

Although there are numerous learning style groupings and models proposed by many researchers, to summarize all of them is not in the scope of this paper. So, selections of them are briefly listed here in order to give an idea about the phenomenon.

3. Differentiating ‘Face-to-Face’ and ‘Online Environments’

In their study, Paechter and Maier (2010) tried to reveal the aspects of e-learning courses that students experience as being favorable for learning, as well as students’ preferences about online or face-to-face learning components. Their study indicated that students preferred online learning, “... for its potential in providing a clear and coherent structure of the learning material, in supporting self-regulated learning, and in distributing information” (p. 292), whereas, “They preferred face-to-face learning for communication purposes in which a shared understanding has to be derived or in which interpersonal relations are to be established” (p. 292). Since learners prefer different learning environments for different purposes, it is worth investigating the factors that may show diversity between different learning environments.

Heaton-Shrestha, Gipps, Edrissisingha and Linsey (2007) conducted a study in order to address the issue of whether student learning style has an impact on the use of learning technologies such as a virtual learning environment (VLE). The researchers concluded that, “...with respect to the question of whether ICT use changes style or style changes ICT use, we found that style shaped use, as learners tended to use the VLE in a manner consistent with their preferred style. However, in some cases, students used the VLE to deliberately change their style and approach.” (p. 461). Comparing student satisfaction in online vs. face-to-face instruction, the researchers postulated that learning style is influenced in distance education (eg. Eastmond 2000; Soles & Moller 2001; Offir, Bezalel & Barth 2007; Mehlenbacher et al. 2000;
Learning style has been shown to play an influential role in students’ reactions to a Web-based instructional program, with students exhibiting different cognitive styles showing varying preferences with respect to the features of TML (Chen, Chen, & Xin, 2004). Hsieh and Dwyer (2009) examined the instructional effectiveness of different online reading strategies for students identified as possessing different learning styles, either internal or external locus of control styles, on tests measuring different learning objectives. The researchers concluded that, “... different reading strategies have different instructional structures and functions in facilitating student achievement of different types of learning objectives” (p. 47).

Battalio (2009) conducted a study in order to determine the extent to which student learning styles are associated with success in online learning environments, particularly when controlling the amount of collaboration available to students. As concluded by the researcher, “The results of this study have shown significant associations between students’ learning styles and success in distance education and offer insight into the relationship between learning style and mode of delivery” (p. 83). Lightner, Doggett and Whisler (2010) also stated that, “Students in an online program must be more resourceful because they do not have immediate access to instructional and technical resources and are called upon to make decisions without instant corroboration; hence, learning style inventories may be of value for measuring this attribute and predicting success in such an environment.” (p. 8).

Graf, Kinshuk and Liu (2009) proposed an automatic approach for identifying students’ learning styles in the Learning Management System, which is based on inferring students’ learning styles from their behavior in an online course. They concluded that the information about students’ learning styles can be used for; (a) providing teachers with more information about their students, showing them that their students have different preferences and ways in which they learn, (b) helping teachers in understanding why and when students may have difficulties in learning, and (c) making students themselves aware of their own learning styles, helping them to better understand their strengths and weaknesses in the learning process. Topçu (2008) also conducted a research study which took into account the learning styles of the participants and verified the efficacy of the intentional repetition technique in improving interaction in asynchronous online discussions. Furthermore, this researcher stated that, “… instructors’ awareness of the learning styles and cultural context may be helpful for increasing students’ performance in web-based learning environments” (p. 916).

Franzoni and Assar (2009) developed an integrated taxonomy combining learning styles, different teaching strategies and the corresponding appropriate electronic media. The researchers’ goal was to provide a structured method to help in facilitating the learning process and personalizing the pedagogical resources. Hence, they concluded that, “The presented taxonomy is thus a useful tool to get a better knowledge of the wide variety of resources available to use in class” (p. 28). Coole and Watts (2009) investigated communal e-learning styles in online classrooms; they proposed that their study highlighted the need for multiple pathways in web-based provision for trainees on such courses to meet individual, preferred, learning styles. The researchers also concluded that, “While the context of this study focuses on the VLE, given the rapid developments in ICT people are now gaining knowledge informally using other forms of technology” (p. 23).

In the e-learning environment, students with social, aural, verbal, and solitary learning styles have high academic achievement respectively. Students with logical and physical styles have the least academic achievement (Kia et al., 2009). Ramayah et al. (2009) highlighted that female students were found to demonstrate slightly higher preference for...
the V(isual) and A(ural) learning styles when compared to male students. Lindsay (1999) found that the harmony between learning style and teaching style increased academic achievement and satisfaction with learning.

Since learning styles provide information about individual differences in learning preferences, they are able to indicate how instruction can be best designed to support learning preferences and increase academic achievement (Akdemir & Koszalka, 2008). Whisler (2005) recommends that students considering online courses should assess their self-efficacy, interaction behaviors and time management skills to see to what extent online programs are suitable for them. As observed in the literature, knowing about self-capabilities may lead an individual to perform better on the required tasks. Since e-learning is mainly based on self-control and self-regulation, learners’ awareness of their own capabilities is now much more important than ever.

5. Possible Preferences in Online Environments

Li, Leh, Fu and Zhao (2009) conducted action research to reveal learners’ preferences while using online resources and ended up with eight preferences. Their findings indicated that learners mostly preferred using resources from the course web site rather than other sites, preferred using online resources and online syllabus rather than printed ones, preferred text-based FAQs rather than those in video format, preferred a teaching sequence which conforms to their individual sequences and preferred the shared use of online resources.

Kinshuk, Liu and Graf (2009) investigated the interactions between students’ learning styles, behavior, and performance in an online course which did not match their learning styles. Their findings showed that “… learners with strong preferences for a specific learning style have more difficulties in learning, in terms of achieving lower scores, than learners with mild learning style preferences” (p. 750).

Johnson (2007) investigated the impact of learning style on college student preference for and achievement under two specific web-based instructional conditions—quizzes and study groups. They found that different learners had different preferences, for instance active learners expressed a preference for face-to-face study groups rather than web-based study groups, whereas visual learners expressed a preference for web-based quizzes rather than web-based study groups. The researcher also validated these preferences by indicating decreased academic achievement under the less-preferred study condition. Hence, based on her findings, Johnson (2007) concluded that, “Instructional applications of web-based technology may provide mechanisms to accommodate student learning style more consistently in higher education.” (p. 630).

Saeed, Yang and Sinnappan (2009) conducted action research to validate their research framework which, “… is based on the fact that learners’ individual characteristics influence their preferences for using technology and that the use of appropriate technology positively influences the academic performance” (p. 100). The researchers finally underlined the significant relationships between students’ learning styles and technology preferences and their impact on academic performance. Akkoyunlu and Soylu (2008) also revealed that, “… students’ views on the blended learning process, such as ease of use of the web environment, evaluation, face-to-face environment, etc., differ according to their learning styles” (p. 183). Terrell and Dringus (2000) and Lippert, Radhakrishnam, Plank and Mitchell (2001) measured learning styles of online learning students with a high level of computer literacy, based on the Kolb’s LSI. Both studies showed that learning style had no effect on success in online learning but it determined the preference for this delivery format. For instance, students who fell into the Converger and Assimilator learning styles felt more comfortable taking distance learning courses.

One of the questions, whether there is a relationship between the subjects’ learning style and preferred method of instruction, is an important one to understand when designing online courses. Jiang and Ting (1998) evaluated students’ perceived learning in an online course and they found that the more interactive the course design, the greater the students’ perceived learning and the more interactive the professor, the more the students participated. These findings support those found by Swan et al. (2000), who suggested that, the more interactive the instructor, the higher the student satisfaction. In addition, students also felt that more learning occurred if instructor interaction was high. Furthermore, they mentioned that students had a higher level of satisfaction and learning, as demonstrated by courses that had higher instructor interaction, interactions with classmates and higher levels of activity.

Butler (2004) studied students’ learning styles and their preferences for online instructional methods. The results revealed that there were several significant positive and negative relationships between learning styles and instructional methods. For example, the concrete sequential style exhibited a positive relationship with e-mail use, the concrete random style revealed a negative correlation to online examinations, while the Abstract sequential type demonstrated a positive relationship with computer simulations, but a negative one to the use of multimedia (p. 106).

Saeed, Yang and Sinnappan (2009) concluded in their study that, “…today’s learners are flexible in stretching their learning styles and are able to accommodate varying instructional strategies, including the use of emerging web technologies” (p. 106). Saeed, Yang and Sinnappan (2009) also suggested that the learning styles of today’s learners are flexible enough to experience varying technologies and the researchers also underlined that learners’ technology preferences are not limited to a particular tool. It is obvious from the literature that both learning preferences and learning styles are at least having a degree of impact on some of the variables like motivation, success and interaction in online learning environments.
6. Possible E-Learning Styles

For determining effective e-learning styles that will be worth taking into consideration in online environments, researchers asked four open-ended questions to distance learners. Voluntarily, 161 learners answered the open-ended questions. The questions were:

1. How do you think that you learn best?
2. What are you doing for remediation?
3. In what way do you prefer to study?
4. What precautions do you take to be more successful while studying?

The researchers analyzed the qualitative data and found several emerging themes. These themes were used to reveal and clarify the properties of e-learners. Hence, after reading through the considerable literature and filter what is relevant to an online perspective, and based on the qualitative analysis of open-ended questions, and analyzing learning styles proposed by Memletics Learning Style Inventory (2004), Kolb (1976), Felder and Soloman (1991), Felder-Silverman Learning Model (1988), and Grasha-Reichmann Learning Style Scales (1996) in depth, researchers ended up with eight dimensions of learning styles that should be considered in online environments. These eight e-learning styles are classified as shown in Table-1. In fact, there are numerous characteristics of individuals, but for this study the main goal was to detect the most general and common aspects that can be aligned with possible instructional methods, media and materials for e-learning.

<table>
<thead>
<tr>
<th>Individual/Solitary Learning</th>
<th>Social/Collaborative Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>An individual learner;</td>
<td>A social learner;</td>
</tr>
<tr>
<td>• prefers to study on their own,</td>
<td>• likes to engage in interactive group activities,</td>
</tr>
<tr>
<td>• reserves a long time to think about the topics related to her/his on life,</td>
<td>• places importance on communication with instructors and other learners,</td>
</tr>
<tr>
<td>• prefers to study independently with facilitation,</td>
<td>• prefers activities and projects that require group work,</td>
</tr>
<tr>
<td>• takes her/his own responsibility for learning,</td>
<td>• thinks that learning is the common responsibility of the instructor and learner,</td>
</tr>
<tr>
<td>• trusts herself/himself for her/his ability to learn,</td>
<td>• likes to facilitate and help other learners,</td>
</tr>
<tr>
<td>• prefers to engage in asynchronous learning activities (forum, blog, wiki etc.), and</td>
<td>• enjoys to engage in synchronous learning activities (chat, virtual classroom, whiteboard application etc.), and</td>
</tr>
<tr>
<td>• engages in group activities after self-preparation first.</td>
<td>• likes to contribute and manage group work.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Auditory Learning</th>
<th>Visual Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>An auditory learner;</td>
<td>A visual learner;</td>
</tr>
<tr>
<td>• thinks that she/he learns best by “hearing”,</td>
<td>• thinks that she/he learns best by “seeing”,</td>
</tr>
<tr>
<td>• likes listening to music while travelling, working and studying,</td>
<td>• links between what she/he heard and saw previously in daily conversations,</td>
</tr>
<tr>
<td>• loves to hear about the experiences of various people,</td>
<td>• enjoys telling stories and jokes,</td>
</tr>
<tr>
<td>• distinguishes between different sounds and recognizes sound,</td>
<td>• prefers subjects like literature, history and foreign languages,</td>
</tr>
<tr>
<td>• plays an instrument or sings songs,</td>
<td>• prefers discussing problems and thoughts rather than working on them,</td>
</tr>
<tr>
<td>• dislikes silent places, and</td>
<td>• has a wide range of vocabulary and likes to use the right word in the right situation, and</td>
</tr>
<tr>
<td>• prefers instructors who explain the topic in detail.</td>
<td>• expresses herself/himself orally or in writing very well</td>
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<table>
<thead>
<tr>
<th>Concrete Learning</th>
<th>Abstract Learning</th>
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</thead>
<tbody>
<tr>
<td>An concrete learner;</td>
<td>An abstract learner;</td>
</tr>
<tr>
<td>• thinks that she/he learns best by “doing”,</td>
<td>• thinks that she/he learns best by “reading”,</td>
</tr>
<tr>
<td>• likes activities like sport and dance,</td>
<td>• links between what she/he heard and saw previously in daily conversations,</td>
</tr>
<tr>
<td>• enjoys working with handcrafts like ceramics and sculpture,</td>
<td>• enjoys telling stories and jokes,</td>
</tr>
<tr>
<td>• likes touching objects, clothes and furniture,</td>
<td>• prefers subjects like literature, history and foreign languages,</td>
</tr>
<tr>
<td>• enjoys learning through simulations and playing games,</td>
<td>• prefers discussing problems and thoughts rather than working on them,</td>
</tr>
<tr>
<td>• likes dealing with problems needs creativity, and</td>
<td>• has a wide range of vocabulary and likes to use the right word in the right situation, and</td>
</tr>
<tr>
<td>• enjoys exploring and researching.</td>
<td>• expresses herself/himself orally or in writing very well</td>
</tr>
</tbody>
</table>
These items can easily be converted into complete sentences and used as a learning style inventory which was another goal of this research. Due to this reason, the number of items appearing under the headings is equal. Realizing the different characteristics of our students in online environments and using this data to address all diverse learning styles should increase the probability of knowing our students, providing them with suitable instructional media, methods and environment, making the content easier for them to study and learn, thus increasing the success of the process and products of online learning (Gülbahar, 2005b). So, as educators we should try to reveal the characteristics of our students and reshape our courses based on the emerging characteristics of the class.

### 7. Conclusion

This chapter is written to reveal the possible relationship between e-learning and the use of learning styles as a means to support and enhance learning. As stated by Palloff and Pratt (2003), “Although the Internet is cited as being a big equalizer, dealing with learners should be done considering individual differences in learning, gender, culture, and ability” (p.13). Rogers and McNeil (2009) similarly stated that the quality and efficacy of e-learning will be enhanced by further investigation into the factors that impact student success. One of these factors that will be enhanced by technology integration is learning styles. Gülbahar and Yildirim (2006) conducted research based on individual differences and they concluded it was necessary to present learners with; (a) all possible types of media and material sources, (b) course handouts in various formats, (c) a wide range pre and post activities in addition to the content, (d) enough guidance with various add-ons and (e) a little humor, even for adult learners. They stated that this approach increases the possibility of reaching learners who have diverse learning styles. Already mentioned by Graf, Kinshuk and Liu (2009), Akdemir and Koszalka (2008), Maddux, Ewing-Taylor and Johnson (2002), and Thiele (2003), adequate and appropriate support strategies should be provided to students with different learning styles and online course design should be adopted to accommodate diverse styles when designing e-learning environments.

Cooze and Barbour (2007) underlined the importance of considering e-learning styles: “By utilizing the knowledge gained through learning style inventories and descriptors, the e-teacher should have a greater repertoire of skills to support learning in the virtual classroom and ultimately reach out through and beyond the tools in order to provide quality instruction for all learners.” (p. 15).

In fact, online learning environments possess passive learning features when a student reads, listens, and analyzes graphics, and consist of active learning features when students discuss and express themselves through writing in various platforms. Hence, either grouped like the proposed one, or under different names, to address all possible learning styles in terms of instructional media and materials, instructors should aim to at least provide (a) synchronous and asynchronous learning activities, (b) individual and group work, and (c) supportive interaction and facilitation for individual and social learners; (a) audio and visual materials, (b) podcasts or visuals of sample cases and scenarios, (c) graphic organizers like diagrams, figures, comics and tables within the content, and (d) video casts of teaching performances for auditory and visual learners; (a) hands-on activities, (b) interactive experiences like simulations and games, (c) activities that needs discussion, creativity, exploration and research, and (d) wide range of printed materials like books, hand-outs, worksheets, puzzles, and newspapers for concrete and abstract learners; and finally (a) content considering both inductive and deductive approaches, (b) real-life problems, and (c) guided work plan for logical and sensual learners. From the perspective of instructional methods; instructors should use a mix of all the appropriate methods such as direct instruction, lecture, demonstration, discussion, cooperative learning, case studies, discovery learning, problem-based learning, role-playing, scaffolding, and storytelling in harmony. All of these thoughts and some additional thoughts from Soles and Moller (2001) are summarized in Table-2, just to give an idea to e-instructors.
At this point, remembering the learning and facilitating principles for adults may be also useful. From the learning styles point of view listed by MacKeracher (2009), (1) Adult learners have individual learning styles and mental abilities and are heterogeneous in terms of these characteristics, (2) If learners’ and facilitators’ learning styles mismatch, the result will be unsatisfactory, (3) Learning styles are value-neutral, a style adaptive in one situation may not be adaptive in others, (4) Adults prefer to select learning situations and learning facilitating interactions individually, and (5) Adults prefer to start from the learning activity they feel most comfortable with (p. 82-83). All of these mean that, although you try to reach out learners’ characteristics and try to provide appropriate instructional approaches, the preferences of learners may fluctuate for different content, instructor and so on. So, it is really important to collect continuous data through an inventory, get feedback from the learners as to whether the results are reasonable and appropriate, and re-organize all aspects to reach a more effective solution.

Since there are many researchers who found that learning styles are important for knowledge performance (Manochehr, 2006) and should be considered for effective e-learning (Willems, 2007), it is e-instructors’ responsibility to focus on students’ awareness of learning styles and provide a rich variety of instructional components to address all learners. As also stated by Butler and Pinto-Zipp (2005-2006), “Educators must be challenged beyond the definitions established in the pre-online era, identify the learning styles of online learners, and analyze the types of instructional methods that are unique to online learning.” (p. 219). Because today the Internet has become a learning environment, we should deal with developing quality learning for the online setting. As underlined by Cooze and Barbour (2007), our main goal should be “…to consist of designing instruction which will foster and enhance learning for each student we should deal with developing quality learning for the online setting. As underlined by Cooze and Barbour (2007), our main goal should be “…to consist of designing instruction which will foster and enhance learning for each student we should deal with developing quality learning for the online setting.

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References


Table-2 Possible instructional media, materials and methods for addressing all e-Learning Styles

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Prefers</th>
<th>Instructional Media and Materials</th>
<th>Instructional Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual/ Solitary Learning</td>
<td>Self-study</td>
<td>Asynchronous learning activities that need discussion, creativity, exploration and research</td>
<td>Case studies, problem-based learning and storytelling</td>
</tr>
<tr>
<td>Social/ Collaborative Learning</td>
<td>Group work</td>
<td>Synchronous learning activities like audio and videoconferencing, virtual classroom, social media</td>
<td>Cooperative learning and role-playing</td>
</tr>
<tr>
<td>Auditory Learning</td>
<td>Listening</td>
<td>Audio materials like podcasts of sample cases and scenarios, narrated tutorials</td>
<td>Direct instruction, lecture, case studies</td>
</tr>
<tr>
<td>Visual Learning</td>
<td>Watching</td>
<td>Visual materials like videocasts, video visuals of sample cases and scenarios, simulations, graphic organizers</td>
<td>Demonstration and presentation</td>
</tr>
<tr>
<td>Concrete Learning</td>
<td>Hands-on Activities</td>
<td>Interactive experiences like simulations and games, and activities that need discussion, creativity, exploration and research</td>
<td>Discovery learning and problem-based learning</td>
</tr>
<tr>
<td>Abstract Learning</td>
<td>Reading</td>
<td>Printed materials like books, hand-outs, worksheets, puzzles, and newspapers</td>
<td>Storytelling, discussion and presentation</td>
</tr>
<tr>
<td>Logical Learning</td>
<td>Thinking</td>
<td>Real-life experiences (hierarchical), linear instruction</td>
<td>Discussion, brainstorming and critical analysis of real-world situations</td>
</tr>
<tr>
<td>Sensual Learning</td>
<td>Feeling</td>
<td>Creative experiences (random), rich learning objects</td>
<td>Role-playing, case studies and storytelling</td>
</tr>
</tbody>
</table>
The learning styles, expectations, and needs of online students.

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