An Investigation into Visualization and Verbalization Learning Preferences in the Online Environment

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ABSTRACT

It is understood that typically online learners would have a preference for Visualization over Verbalization in the online learning environment. But do significant differences exist with the age of the learner? This paper will attempt to answer this question.

INTRODUCTION

Do students who are of different ages prefer similar learning styles with regard to online education? This is an interesting question and one that deserves an in depth analysis. Online education is defined as the process of providing instruction when students and instructors are separated by physical distance and technology, often in tandem with face-to-face communication, is used to bridge the gap. Learning styles can be defined as the way each person concentrates on, processes, internalizes, and retains new and difficult academic information.

The instrument that was used consisted of a 44 question survey developed by Barbra Solomon at North Carolina State University. Question numbers 1, 5, 9, 13, 17, 21, 25, 29, 33, 37 and 41 determine if the learner is active or reflective. Question numbers 2, 6, 10, 14, 18, 22, 26, 30, 34, 38 and 42 determine if the learner is a sensing or intuitive learner. Question numbers 3, 7, 11, 15, 19, 23, 27, 31, 35, 39 and 43 measure if the learner is visual or verbal and questions 4, 8, 12, 16, 20, 24, 28, 32, 36, 40 and 44 measure if the learner is a sequential or global learner.

LEARNING STYLE ANALYSIS

In addition to this learning style preference theory developed by Felder and Solomon, many other theories exist regarding learning styles. It is widely agreed that students learn differently. To effectively educate individuals, various researchers have developed learning theories, because educators want to maximize the learning process for the students. It would be counterproductive to simply offer education that was suited for one type of learner. In addition, bright students could develop negative attitudes towards education if the instruction emphasizes a style different from their own. It is extremely important that educators embrace different learning styles. Instructors need to have an understanding of how students learn, so as to provide students with the highest quality educational environment. Several widely accepted learning styles are listed in David Kolb’s Learning Style Inventory.

Kolb’s Four Learning Styles
(1) Convergers: The converger acquires knowledge by thinking/analyzing and then practically applying the new ideas and/or concepts. The ability to practically apply ideas is this learner’s greatest strength.
Convergers organize information through hypothetical deductive reasoning. The emphasis for convergers is to think rationally and concretely while remaining relatively unemotional; (2) Divergers: The diverger acquires knowledge through intuition. Individuals with this preferred style of learning draw upon their imaginative aptitudes and their abilities to view complex situations from many perspectives. Divergers also possess the ability to effectively integrate information into meaningful wholes. However, the diverger’s imaginative ability is his/her greatest strength; (3) Assimilators: The ability to create theoretical models and reason inductively is the assimilator’s greatest strength. Assimilators learn by thinking and analyzing and then planning and reflecting. Assimilators do not emphasize practical application; rather they focus on the development of theories, often discard facts if they do not fit the theory; (4) Accommodators: Unlike the assimilators, accommodators will discard the theory if the facts do not fit. Accommodators excel in situations where they must apply theories to specific circumstances. Their greatest strength is their abilities to complete projects and become fully involved in new experiences. Accommodators approach problems in an intuitive, trial-and-error manner and they obtain information from other people rather than their own analytic abilities. Kolb’s learning styles is shown in Figure 1.

![Figure 1. Kolb’s learning styles.](image)

The ideas behind assimilation and accommodation originate in Jean Piaget’s definition of intelligence as the balance between the process of adapting concepts to fit the external world (accommodation) and the process of fitting observations into the world of existing concepts (assimilation). Convergence and divergence are the two essential creative processes.

Kolb’s learning cycles, known as the KLSI (Kolb Learning Style Inventory), also measure learning cycle preference. Kolb defined four learning cycles: (1) Concrete experience: The learner perceives information from specific experience. For example, they perceive information by feeling, touching, seeing and hearing. They also learn by relating to people and sensitive to feelings. This learner can learn easily by experimenting in the laboratories and in the field of work. Finally, they learn better with audio-visual media like films and multimedia applications;
(2) Reflective observation: The learner processes information by thinking about it. They observe carefully before making a judgment. They view things from different perspectives and look for the meanings of things. Finally, they like to develop observations about their own experiences. A reflective observer can use logs and read journals in order to learn easier and better;

(3) Abstract conceptualization: This learner perceives information abstractly using mental or visual conceptualization. They also analyze ideas logically, plan systematically, and act on the intellectual understanding of a situation. Finally, they create theories to explain observations. This student learns through lecturing, reading and researching;

(4) Active experimentation: This learner perceives information by doing something with it. They have the ability to get things done, take risks and influence people and events through action. In addition, they have theories to solve problems and make decisions. They learn better with simulations, case studies and homework.

The four cycles are tied into learning styles. For instance, a converger favors a learning cycle of abstract conceptualization and active experimentation, which fits since these two learning cycles are characterized by learning by doing and thinking. Since convergers focus on reasoning and solving problems, the cycles and learning styles are closely tied together.

The next few paragraphs will examine the learning styles used in this study which deal with active VS reflective, visual VS verbal, Sequential VS Global and sensing VS Intuition.

**Active and Reflective Learners**

A student’s preference for active or reflective learning may be strong, moderate or mild. A balance of the two learning is desirable. If the student acts before reflecting, they could immerse themselves into the content prematurely and not learn the materials. On the other hand, if the student spends too much time reflecting, they might never get anything done.

If the student is an active learner in a class that allows little or no class time for discussion or problem-solving activities, they should try to incorporate those techniques while studying. For example, an active learner would benefit from group study where the members take turns to explain different topics. Students who are active learners can have difficulty in situations where the class does not involve discussion or problem-solving activities. Active learners typically work very well in groups. Reflective students usually do well to summarize content in the class by writing immediately after class. Characteristics of active and reflective learners are listed as:

1. Active learners tend to retain and understand information best through participating in discussions, applying what they have learned or explaining it to others. Reflective learners prefer to think about it quietly first;
2. Active learners prefer group work. Reflective learners prefer working alone;
3. Sitting through lectures without doing anything physical but take notes is hard for both learning types, but particularly hard for active learners (Soloman & Barbara, 2003).

**Sensing and Intuitive Learners**

A student’s preference for sensing or intuitive learning may be strong, moderate or mild. To be effective as a learner and problem solver, students need to be able to function both ways. If the student overemphasizes intuition, they may miss important details or make careless mistakes in calculations or hands-on work. If the student overemphasizes sensing, they may rely too much on memorization and familiar methods and not concentrate enough on understanding and innovative thinking.
Sensors usually retain information best by identifying how it connects to the real world. A sensing student could have difficulty if most of the material is abstract and theoretically based. Many college lecture classes are aimed at intuitors. Characteristics of sensing and intuitive learners are listed as:

1. Sensing learners tend to like learning facts. Intuitive learners often prefer discovering possibilities and relationships;
2. Sensors often like solving problems by well-established methods and dislike complications and surprises. Intuitors usually welcome innovation and dislike repetition. Sensors are more likely than intuitors to resent being tested on materials that have not been explicitly covered in class;
3. Sensors tend to be patient with details and good at memorizing facts and doing hands-on (laboratory) work. Intuitors may be better at grasping new concepts and often more comfortable than sensors with abstractions and mathematical formulations;
4. Sensors tend to be more practical and careful than intuitors. Intuitors tend to work faster and be more innovative than sensors;
5. Sensors don’t like courses that have no apparent connections to the real world. Intuitors do not like “plug-and-chug” courses that involve a lot of memorizations and routine calculations (Soloman & Barbara, 2003).

Visual and Verbal Learners

Visual learners remember best what they see, such as pictures, diagrams, flow charts, time lines, films and demonstrations. Verbal learners get more out of words—written and spoken explanations.

In most college classes, very little visual information is presented: Students mainly listen to lectures and read materials written on chalkboards and in textbooks and handouts. Unfortunately, most people are visual learners which mean that most students do not receive the benefits of working with their preferred learning styles. Good learners are capable of processing information presented either visually or verbally (Solomon & Barbara, 2003).

Sequential and Global Learners

Sequential learners tend to gain understanding in linear steps, with each step following logically from the previous one. Global learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly “getting it”.

Sequential learners tend to follow logical paths in finding solutions. Global learners may be able to solve complex problems quickly or put things together in novel ways once they have grasped the big picture, but they may have difficulty in explaining how they did it (Solomon & Barbara, 2003).

Many people who read this description may conclude incorrectly that they are global, since everyone has experienced bewilderment followed by a sudden flash of understanding. Sequential learners may not fully understand the materials but they can utilize them in solving homework problems or passing tests. Global learners, who lack good sequential thinking abilities, may have serious difficulties until they have the big picture. Even after they have it, they may be fuzzy about the details of the subject, while sequential learners may know a lot about specific aspects of a subject but may have trouble in relating them to different aspects of the same subject or different subjects.

Many educators fail to adapt their instructional methods to coincide with students learning styles, especially the online learning environment. Since online learning is a relatively new development, many instructors do not know who the typical online students are, and more importantly, how they learn. It is a major problem with online education.
This article will explore the question of:

Does a preference for Visualization or Verbalization exist for GOML (Georgia On My Line) students in different age brackets?

FINDINGS

The instrument was completed by a total of 57 respondents at Valdosta State University during the fall semester of 2010. The following represents the ages of the respondents in the study.

Age: 18-29: N=18
Age: 30-39: N=20
Age: 40-49: N=11
Age: 50-59: N=8

The following table is a breakdown of the percentages for each age bracket and the differences that exist in visualizing and verbalizing information.

<table>
<thead>
<tr>
<th>Age Bracket</th>
<th>N</th>
<th>Visual (%)</th>
<th>Verbal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td></td>
<td>14 (78%)</td>
<td>4 (22%)</td>
</tr>
<tr>
<td>30-39</td>
<td>20</td>
<td>14 (70%)</td>
<td>6 (30%)</td>
</tr>
<tr>
<td>40-49</td>
<td>11</td>
<td>10 (91%)</td>
<td>1 (9%)</td>
</tr>
<tr>
<td>50-59</td>
<td>8</td>
<td>5 (62%)</td>
<td>3 (38%)</td>
</tr>
</tbody>
</table>

Younger online students had a very strong preference for visualization over verbalization. The age bracket of 18-29 had 78% of the students preferring visualization with N at 20. Also, students in the 40-49 age bracket had a strong preference for visualization over verbalization. N for this bracket was only at 11. The graph shown below illustrates the various age brackets and the corresponding number of respondents and the percentages for visualization and verbalization.
CONCLUSIONS AND RECOMMENDATIONS

Future research should analyze the idea of younger online students and the very strong preference for visualization. It is assumed that since this study dealt with online students the preference would be visual over verbal. A study should be complete on traditional students in the age bracket of 18-29 to determine if these students have a strong preference for visualization. One possible reason for this could be the self-confidence of the student in this age bracket. Younger students may not feel comfortable with sharing ideas and thoughts orally.

REFERENCES