An Application of Learning Style Theory To Undergraduate Instruction in Accounting:
A Minnesota Example

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The process of effective undergraduate education requires a great deal of study and preparation. One of the important aspects of instruction is to assist the student in determining their own learning style. Several methods exist which reflect the student's personality attributes as well as the determinant of a style of learning. Brookfield reports (1989, 84).

A number of sophisticated assessment tools and measurement scales exist for the use of educators who wish to investigate learning styles. Examples of these are the Myers-Briggs type indicator (Myers and Myers 1980), the Kolb (1980) self-adaptive style inventory, and the Self-Directed Learning Readiness Scale (Gueliemo 1977).

Each of these learning style indicators is able to identify some critical aspects of how a student learns. For example, a Myers-Briggs assessment using the four letter choices: E or I, S or N, T or F, and P or J is able to determine whether a student will enjoy a linear (stepwise) approach or interactive approach. The Kolb model is characterized by two dimensions. The first dimension represents "concrete experiencing of events at one end and abstract conceptualization at the one extreme." The other dimension has active experimentation at one extreme and reflective observation at the other. The four abilities of the learner are Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation (AE). Several learning styles emerge from different configurations of these abilities. The Converger's primary learning abilities are Abstract Conceptualization and Active Experimentation. This person excels in situations where one answer is correct, are unemotional, and gravitate toward the physical sciences. The Diverger has learning abilities opposite of those of the Converger abilities in Concrete Experience and Reflective Observation. This person performs well in brainstorming sessions and is able to view concrete situations from many perspectives. The Assimilator has dominant abilities in Abstract Conceptualization and Reflective Observation. The strength is in the ability to create theoretical models. The Accommodator has abilities in Concrete Experience and Active Experimentation. Strengths are in the area of execution of plans and involvement in new experiences. The Kolb Model is based upon the "emergence of life orientations as a function of dialectic tensions created between different modes of relating to the world."

Regardless of the model chosen to indicate learning style, it is still necessary to work from a basic learning style type to specific curriculum designs.

This paper will focus on a unique learning style indicator which relates basic learning style theory to learning preferences of the student as revealed in an instrument designed by Fleming and Mills. This indicator is very useful in designing the curricular mix which will be presented to students. It also makes them aware of different strategies that they can undertake to improve their comprehension of material presented. Data was presented from an instructional survey conducted in an introductory accounting class at the University of Minnesota during fall quarter of 1997.
**Attributes of "New" Learning Style Topology**

The model proposed in this paper is based on learning, personality and androgenic differences. Questions in the instrument are based on revealed choices in applying learning to situations. For example, one question asks how you would give directions to a person. The choices are (a) draw a map on a piece of paper (b) write down directions without a map (c) tell the person what the directions are, or (d) provide actual assistance (show the person the way). The learning dimensions which emerge from the survey are V(Visual); R(Reader); K(Kinesthetic) and A(Aural). The Kinesthetic type learns using all the senses, prefers real life examples, desires field trips, and uses trial and error to solve problems. Visual learners prefer underlined points, the use of colors to illustrate and symbolic representations. Readers use lists, definitions, utilize handouts and other readings as well as relying on lecture notes. Aural learners prefer to have concepts described, discussion, and relish to opportunity to explore ideas. Neil Fleming and Colleen Mills created this instrument to measure direct instructional attributes. Their essay, "Not Another Inventory, Rather a Catalyst for Reflection" establishes the uniqueness of this typology.

**Results of Survey**

The results of a survey administered in the Principles of Accounting course at the University of Minnesota were as follows:

<table>
<thead>
<tr>
<th>Learning Type</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>Reader</td>
<td>7</td>
<td>22.5</td>
</tr>
<tr>
<td>Aural</td>
<td>7</td>
<td>22.5</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>13</td>
</tr>
</tbody>
</table>
Relationship To Other Learning Style Types

The Fleming-Mills learning style inventory is related to several other learning style instruments. The Kolb Learning Inventory (LSI) is based upon dominant abilities possessed by the learner. These are Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation. The learning style types which emerge are the Converger whose strong abilities lie in Abstract Conceptualization and Active Experimentation--focusing on practical application of ideas; the Diverger whose abilities are most evident in Concrete/Experience and Reflective Observation (RO--the ability to see many aspects of an issue); the Assimilator whose abilities lie in Abstract Conceptualization and Reflective Observation--the capability of building theoretical models; and the Accommodator who is best at Concrete Experience and Active Experimentation--the ability to adapt to specific circumstances.

The Myers-Briggs type indicator is an example of determining personality differences. It is based on the qualities of Extroversion/Introversion, Sensation/Intuition; Thinking/Feeling, and Perceiving/ Judging. Table 1 shows the relationship between the Kolb LSI and Myers-Briggs types.

Table 1. Correlations Between Learning Style Inventory Scores and Personality Tests

<table>
<thead>
<tr>
<th>Myers-Briggs Type Indicator</th>
<th>Kolb Abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CE</td>
</tr>
<tr>
<td>Extroversion</td>
<td>-.13</td>
</tr>
<tr>
<td>Introversion</td>
<td>.18</td>
</tr>
<tr>
<td>Sensation</td>
<td>--</td>
</tr>
<tr>
<td>Intuition</td>
<td>--</td>
</tr>
<tr>
<td>Thinking</td>
<td>-.31*</td>
</tr>
<tr>
<td>Feeling</td>
<td>.39**</td>
</tr>
<tr>
<td>Judging</td>
<td>-.22</td>
</tr>
<tr>
<td>Perceiving</td>
<td>.19</td>
</tr>
</tbody>
</table>


* p < .05, 2-tailed test.
** p < .01, 2-tailed test.
This table shows that individuals that are high on Concrete Experience also use sensation as a way of perceiving and feeling as a way of judging. Abstract Conceptualizes use intuition as a way of perceiving and thinking as a way of judging, Active Experimenters are likely introverts who use sensation as a judging mode, while Reflective Observers are likely introverts who use the intuitive perceiving mode.

The Fleming Mills types are Visual, Kinesthetic, Aural, and Reader. Table 2 lists the preference for certain learning situations revealed by Kolb LSI types.

Table 2. Correlations Between LSI Abilities and Learning Situations

<table>
<thead>
<tr>
<th>Situations Involving</th>
<th>Kolb Abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CE</td>
</tr>
<tr>
<td>Readings (Reader)</td>
<td>-.21**</td>
</tr>
<tr>
<td>Exercises &amp; Simulations (Kinesthetic)</td>
<td>.13</td>
</tr>
<tr>
<td>Lectures (Aural) (Visual)</td>
<td>.04</td>
</tr>
<tr>
<td>Projects (Kinesthetic)</td>
<td>.08</td>
</tr>
<tr>
<td>Small Group Discussion (Kinesthetic)</td>
<td>-.05</td>
</tr>
<tr>
<td>Case Studies (Kinesthetic)</td>
<td>-.03</td>
</tr>
<tr>
<td>Seminars (Visual)</td>
<td>.01</td>
</tr>
</tbody>
</table>


* p < .05, 2-tailed test.
** p < .01, 2-tailed test.
*** p < .001, 2-tailed test.

This table shows that Readers are likely to possess abilities such as CE, AC, and AC-CE. The Kolb types all involve some of these attributes, but there is not one direct match. The Aural and Visual types tend to be associated with the RO and AE dimensions of Kolb’s LSI. Once again, there is not one Kolb type that exemplifies these qualities to the exclusion of others. Kinesthetic types were closely related to the AC ability--Kolb--which implies Convergers or Assimilators as the type match. Accommodators are also related to Kinesthetic learning types.
Adapting Critical Thinking To Learning Style Types

Brookfield (1989) suggests that another way of assessing typology is to ask a student to describe a learning project that they have undertaken. Questions would deal with how they set goals, how they planned to measure the degree of success or outcome, and how they described the process of learning. The paper will describe how some of the exercises used in ApEc 1250 address both critical thinking and the learning style types identified by the Fleming-Mills Inventory.

The activity of critical thinking is based on several assumptions. These are as follows:

1. Critical thinking is a productive and positive activity.
2. Critical thinking is a process, not an outcome.
3. Critical thinking manifests itself in different ways depending on the context.
4. Critical thinking is triggered by positive as well as negative events.
5. Critical thinking involves emotive as well as rational aspects.

One of the important aspects of critical thinking is the ability to identify and challenge assumptions, the recognition of the importance of context, the process of imaging and exploring alternatives and reflection as to the impact of the various alternatives (Brookfield 1989).

The ApEc 1250 course uses lecture, recitations, student journals, accounting problems performed manually and on the computer using Pacioli (accounting software from M-USA; a final project requiring analysis of a financial statement which is presented orally by small groups, small decision cases, video tapes, and short research exercises using Internet and other sources). Daily news items involving accounting are discussed each week. A licensed public accountant speaks to the class during the last week of class. Examinations and quizzes are used to evaluate the student’s knowledge.

Each of these exercises appeals to a different learning style. The written material including news items appeals to the Reader Style; case studies and problems including the project appeal to the Kinesthetic Style. Class discussion and lectures appeal to the Aural style. Guest speakers and presentations (as scheduled) would appeal to the Visual style.

Students are encouraged to think about and evaluate various aspects of the general rules of accounting as summarized in the GAAP rules. Students can choose to study topics such as the dangers of creative accounting practices and other issues. They can challenge the actions of a firm as summarized in its annual report in terms of implications of these actions--be they restructuring, offshore investments, and other business choices. One specific example of an issue which spawns critical thinking is how airlines handle the accounting of frequent flyer miles. This issue has many facets which relate to assumptions dealing with program purpose, redemption, etc.
The model which appears to fit these activities is one where curriculum and activities are designed to encourage the evaluation of assumptions/practice. Figure 1 shows this process.

![Figure 1. A Critical Learning Approach to Curriculum Design](image)

Figure 1. A Critical Learning Approach to Curriculum Design

This paper has reported on an exercise to evaluate student learning type and integrated this concept into encouragement of critical thinking. As educators strive for greater effectiveness in instruction, this conceptual approach will help to facilitate learning in business and other topical areas. It is noteworthy that the most common type reported in ApEc 1250 was Visual, followed by Aural and Reader types. Based upon this survey, I plan to introduce more visual materials such as photos, diagrams, and other color contrasts which highlight and support various points. Addition changes include creation of diagrams which illustrate accounting concepts.
References


