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**Learning styles: An issue in clinical education?**

Clinically based Certified Registered Nurse Anesthetists are often called upon to serve as clinical instructors for student nurse anesthetists. There is evidence that various individuals may have different learning styles and that adapting instructional methods to these learning styles may be helpful. However, such adjustments are not required for effective clinical instruction and success in the educational process is not dependent on the instructor's ability to adapt teaching styles to students’ preferences.

**Key words:** Clinical instruction, instructional effectiveness, learning style.

As of January 2005 there were 94 accredited nurse anesthesia educational programs preparing Certified Registered Nurse Anesthetists (CRNAs) in the United States. There are an additional 10 programs in various stages of development. The number of clinical sites for these programs has increased from 497 in 1994 to more than 1,200 as of January 2005. With this increase many CRNAs who previously had been exclusively involved in providing clinical patient care are now becoming involved in the clinical educational process of student nurse anesthetists. While these CRNAs may well be expert clinicians, they sometimes express concern regarding their lack of theoretical concepts regarding the teaching/learning process. Clearly, there is a different skill set used when providing excellent anesthesia care to patients compared with teaching others to provide such care.

Anecdotally, clinical CRNAs who become involved in the educational process of student nurse anesthetists in the clinical setting often notice that all students do not “learn the same way.” Such differences may well be due to student learning style. The term “learning style” was likely initially used in 1954 by Thelen.1 The purpose of attempting to define the learning style of any particular individual is to help to construct learning experiences that are most likely aligned with the learning need of a particular student. Learning styles can be said to arise from a combination of cognitive, affective, and psychological behaviors that create a tendency, on the part of learners, to adopt particular strategy in learning.2 Learning style can be viewed as a “distinct and habitual manner of acquiring knowledge, skills, or attitudes through study or experience.”3 Interestingly, although the concepts of “learning” and “thinking” are obviously intertwined, instruments have been developed to assess individuals’ cognitive style, and it has been demonstrated that they are distinct entities. Learning style and cognitive style are not the same.4

**Review of literature**

Multiple instruments have been created in an attempt to classify the learning style of individuals. One of the most commonly used is an instrument called the Learning Style Inventory that classifies learners as either a “diverger,” “assimilator,” “converger,” or “accommodator.”5 The concept of the learning styles as expressed by Kolb3 is an outgrowth of the personality theory of Karl Jung, the work by John Dewey emphasizing the need for learning to be grounded in experience and studies by Karl Lewin showing the importance of people being active in their learning.6 Some, specifically involved in higher education, prefer to conceptualize student learning, as described by Gordon Pask, as involving 3 conceptual styles, namely: “holist,” “serialist,” and “versatile,” as well as related distinctions used to describe learning as either “deep,” “surface,” or “strategic” in nature.7 Another well known instrument was later devised by Honey and Mumford who created the Learning Style Questionnaire.8 Although the Learning Style Inventory and the Learning Style Questionnaire instruments are used today, it has been suggested that the Learning Style Inventory by Kolb5 is superior and better supported by psychometrics than the Learning Style Questionnaire devised by Honey and Mumford.9 Others have become skeptical of the meaning and significance of the Mumford model.10 While it is certainly in common use, the Learning Style Inventory of Kolb is not universally accepted as valid.11
As one of the most frequently used models, the terminology of learning style as discussed here will deal with the concepts used in conjunction with the Kolb Learning Style Inventory. The Learning Style Inventory, as constructed by Kolb, is a 12-item questionnaire in which the subject “rank orders” the endings presented to given sentences. Each potential response corresponds to one of the 4 types of learning orientations shown in Table 1.

The 4 learning orientations can be said to be the opposite ends of 2 continuums. Along 1 continuum, “concrete” and “abstract” represent the ends. On the other, “active” and “reflective” constitute the 2 poles. One can view the 2 continuums as a graph in which the horizontal axis is the active/reflective scale and the vertical axis is the concrete/abstract scale. If these 2 scales cross at their midpoints, quadrants are created as shown in the Figure. Each of the quadrants shown in the Figure is labeled with a phrase that describes the style of learner whose scores on each axis place the learner within that quadrant. Each of these individuals has a preference for distinct types for learning experiences.

- **Convergers.** Those who are classified as convergers tend to be pragmatic and like to learn using abstract conceptualization and active experimentation. Those with this style tend to do best in situations where there is a single best correct answer to a question or solution to a problem. Their knowledge base seems to be organized so that through hypothetical deductive reasoning they can focus in on specific problems. Individuals with this style tend to be less emotional and prefer to deal with things rather than people.

- **Diversers.** Those classified as diversers are reflective and tend to prefer observation and concrete experiences. These individuals have opposite learning strengths from those classified as convergers. Diversers tend to be interested in people and are often described as emotional and imaginative.

- **Assimilators.** Those classified as assimilators are often described as more theoretical and tend to prefer abstract conceptualization and reflective observation. The individuals tend to excel at inductive reasoning and arriving at an integrated explanation for observation that may be viewed by others as disparate.

- **Accommodators.** Those classified as accommodators are often described as activists who tend to prefer learning that includes concrete experience and active experimentation. Their greatest interest is in actually doing things. Accommodators tend to be more willing to take risks than those individuals with other styles. In circumstances where a theory or plan does not seem to fit the facts as they perceive them, accommodators tend to ignore the theory or plan and use the trial and error model. Accommodators are comfortable with people, but may sometimes be perceived as impatient.

Table 1. Learning approaches associated with specific learning orientations

<table>
<thead>
<tr>
<th>Learning orientation</th>
<th>Characterized by</th>
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<tbody>
<tr>
<td>Concrete experience</td>
<td>An experience based, involved approach to learning</td>
</tr>
<tr>
<td>Abstract conceptualization</td>
<td>A conceptually based, analytical approach to learning</td>
</tr>
<tr>
<td>Active experimentation</td>
<td>An action based, active approach to learning</td>
</tr>
<tr>
<td>Reflective observation</td>
<td>An observation based, impartial approach to learning</td>
</tr>
</tbody>
</table>

Figure. Classification of learning styles

<table>
<thead>
<tr>
<th>Concrete</th>
<th>Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accomodator</td>
<td>Diverger</td>
</tr>
<tr>
<td>Active</td>
<td>Reflective</td>
</tr>
<tr>
<td>Converger</td>
<td>Assimilator</td>
</tr>
<tr>
<td>Abstract</td>
<td></td>
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</table>
learning methods deployed within each stage of learning are attractive to them.\textsuperscript{13} It also is possible that people may be drawn to certain areas of study based on their preferential learning styles or personality types.\textsuperscript{14} Individuals being educated for different professions often have, when examined by groups, different learning styles. A recent study of radiographers found that the majority of subjects, 66%, were equally divided between the Kolb classifications of convergers and assimilators.\textsuperscript{14} This finding is distinct from nurses who were shown to be primarily in the diverger and accommodator groups. The majority representation of diverger and accommodator grouping more closely parallels those Learning Style Inventory classifications found in physicians. As has been noted those classified as convergers tend to have a preference to perceive information through symbolic representation of experience working with concepts and abstract ideas rather than people. Convergers tend to be more technically oriented and prefer to apply problem-solving skills in a practical way.\textsuperscript{8}

Learning styles are not static and may change as a result of the type of instruction to which the student is exposed. The styles also may be affected by what types of activities are experienced, and methods used by the student are shown to bring successful experiences. A study using the Kolb Learning Style Inventory sampling student nurse anesthetists demonstrated that those having completed less than 12 months in a nurse anesthesia program displayed, as a group, no dominant preference for any particular learning style. However, the group of students who had completed greater than 12 months in their programs showed that 80% were equally divided into the converger and assimilator groupings.\textsuperscript{15} Whatever the preferred learning style, it is not an indicator of increased likelihood of academic success. It is important for students in the health professions to know that all 4 of Kolb’s learning styles where appropriate and to develop their least preferred style in order to maximize their potential.\textsuperscript{16}

There is little agreement regarding the importance of “matching” the learning styles of the student with instructional methodology used in teaching. Some have claimed that when the learning styles of teacher and student are different, discord can result.\textsuperscript{3}

Additionally some studies suggest that when faculty and students share the same learning style there is a decreased failure rate and improved instructional effectiveness.\textsuperscript{17} Others have found that when matching faculty and student, learning styles had no effect on academic performance.\textsuperscript{18} There is no clear answer to this question as the results of the matching of faculty and student learning styles are inconsistent and inconclusive.\textsuperscript{19} The issue of academic success may not be one of matching, but rather of the consideration of the needs of both learner and teacher. Such consideration within a curriculum has been reported to increase the self-reflective learning behavior of students.\textsuperscript{20}

**Discussion**

The question of matching of learning styles may be less of an issue when dealing with nurse anesthesia students than with other university students, thus, they are all adult learners. Adult learners may well be more flexible than younger students with regard to learning style and may well be more able to adapt to different teaching styles.\textsuperscript{21} It may be difficult to predict what learning style may be preferred at the outset by any specific nurse anesthesia student, as specific learning modes are not correlated with age or gender of the adult student.\textsuperscript{22}

Additionally, one should be aware that although familiarity with

<table>
<thead>
<tr>
<th>Learning style</th>
<th>Activity preferred</th>
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<tbody>
<tr>
<td>Converger</td>
<td>Receiving practical tips from an expert laryngoscopist. Using the “help” feature on software used to teach intubation. Going step by step through the process.</td>
</tr>
<tr>
<td>Diverger</td>
<td>Observing how other people intubate. Thinking about the intubation just performed by the student. Recording thoughts about experiences with intubations attempted.</td>
</tr>
<tr>
<td>Assimilator</td>
<td>Understanding the theory and being clear on the “concept” of intubation. Reading a text to get a clearer grasp of what was performed. Reading to discover the pros and cons of different intubation techniques.</td>
</tr>
<tr>
<td>Accomodator</td>
<td>Picking up a laryngoscope and attempting the procedure. Practicing intubation procedure repeatedly. Using “people skills” to induce experts to help develop a personal style.</td>
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</table>

Table 2. Preferred learning activities associated with specific learning styles
the concept of learning styles is important as a way to understand and conceptualize that students have preferential learning activities, it must be recalled that the act of clinical instruction of a nurse anesthesia student is inherently different from teaching medieval history or calculus in a classroom. Healthcare education is, and properly so, an endeavor of a hierarchical nature. Clinical learning experience is essential to our profession. It is the laboratory where outcome criteria is demonstrated and related to skills and concepts introduced in the classroom. Learning takes place in a situation where students are participating in the care of patients for whom their clinical instructor is responsible and where decisions regarding life and death are frequently made.

Even in hospitals dedicated to teaching, patients in an operating room are not there with the purpose of being a clinical teaching resource for students. Patients are there to be anesthetized for the performance of some therapeutic or diagnostic procedure that they require. The primary purpose of the anesthesia provider in this circumstance, whether a CRNA or an anesthesiologist, is to function as a provider. In all such clinical situations, patient safety is always the primary and overriding concern. As the only individual who is credentialed, both legally by the government and administratively by the hospital, to provide anesthesia care to patients, the instructor not only directs but also remains responsible for patient care. Accordingly, in circumstances where the learning style of the student is not aligned with the preferences of the clinical instructor regarding the techniques of management of any particular anesthetic, the student is the individual who will need to adjust expectations and desires. In the clinical area, learning is experiential.

Although hierarchical, the structure and function of the clinical department in which the nurse anesthesia education takes place must display respect for all members of the department, including students. Department members serving as clinical instructors may have difficulty in seeing these learners as individuals deserving of respect and in need of mentoring. As discussed earlier, while support was not found for using instructional strategies that match students' temperament-based learning styles, studies have indicated that a strategy that capitalizes on personalization was superior for all types of students. This personalization of clinical instruction may well be more of an indicator of educational success than an attempt to match learning and teaching styles.

Summary
When one considers the concept of experiential learning, underlying this concept is the belief that students should be actively involved in the process. Involvement does not only merely indicate the relationship of the teacher and learner. Considerable learning in the clinical area also is a result of student-to-student interactions. In order for the student/teacher and student/student interaction to be facilitated, the clinical department must value these interactions. Historically, CRNA programs were hospital based and it was not uncommon for students to receive the vast majority of all of their clinical experience in the operating rooms of the institution. Many student nurse anesthetists now receive instruction in multiple clinical institutions that have affiliation agreements with the university conducting the program. Such an arrangement may entail students participating in cases in many different clinical anesthesia departments with different philosophies of practice and methods of departmental organization. To be effective in the area of education, these clinical departments must create an environment where student/teacher, student/student, and teacher/teacher interactions are valued and facilitated. It has been said that in the educational arena, “what matters is what gets attended to.”

Unlike some other types of students seen in hospitals, student nurse anesthetists come to the educational process as fully licensed professionals with many years of experience. Depending on their experience prior to beginning anesthesia school, it is not uncommon for some nurse anesthesia students to have a knowledge base in certain didactic and clinical areas that exceed that of the clinical instructor. However, both participants in this process need to remain mindful of the fact that it is the clinical instructor who is the expert in the overall anesthesia management of the patient. The process of nurse anesthesia education has changed dramatically since the time many of today's clinical instructors were students themselves. Rather than looking back at how “things used to be,” it is more productive to look ahead at what is the best, most efficient, and safest way to help mold our current students into our future colleagues. By coaching students, prompting them with difficult questions, teaching them to be critical questioners, and offering them respect repeatedly produces the best results. Good clinical instructors set their sights on excellence and strive to push students past their own, all too often, low level of expectation. In view of the fact that each student progresses at a different rate, the
“one size fits all” educational supervision is not appropriate. By customizing the instructional process, clinical instructors can fulfill their crucial role of preparing students to eventually achieve their new status as colleagues and expert providers of anesthesia care.

REFERENCES


AUTHORS

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