

The Learning Styles of Orthopedic Residents, Faculty, and Applicants at an Academic Program

Raveesh Daniel Richard, MD, Brian Francis Deegan, BS, and Joel Christian Klena, MD

Department of Orthopaedic Surgery, Geisinger Health System, Danville, Pennsylvania

BACKGROUND: To train surgeons effectively, it is important to understand how they are learning. The Kolb Learning Style Inventory (LSI) is based on the theory of experiential learning, which divides the learning cycle into 4 stages: active experimentation (AE), abstract conceptualization (AC), concrete experience, and reflective observation. The purpose of this investigation was to assess the learning styles of orthopedic residents, faculty, and applicants at an east-coast residency program.

METHODS: A total of 90 Kolb LSI, Version 3.1 surveys, and demographic questionnaires were distributed to all residency applicants, residents, and faculty at an academic program. Data collected included age, sex, type of medical school (MD or DO), foreign medical graduate status, and either year since college graduation, postgraduate year level (residents only), or years since completion of residency (faculty only). Seventy-one completed Kolb LSI surveys (14 residents, 14 faculty members, and 43 applicants) were recorded and analyzed for statistical significance.

RESULTS: The most prevalent learning style among all participants was converging (53.5%), followed by accommodating (18.3%), diverging (18.3%), and assimilating (9.9%) ($p = 0.13$). The applicant and resident groups demonstrated a high tendency toward AE followed by AC. The faculty group demonstrated a high tendency toward AC followed by AE. None of the 24 subjects who were 26 years or under had assimilating learning styles, in significant contrast to the 12% of 27- to 30-year-olds and 18% of 31 and older group ($p < 0.01$).

CONCLUSIONS: The majority of applicants, residents, and faculty in the orthopedic residency program were “convergers.” The converging learning style involves problem solving and decision making, with the practical application of ideas and the use of hypothetical-deductive

reasoning. Learning through AE decreased with age, whereas learning through AC increased. (J Surg 71:110-118. © 2014 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: learning styles, orthopedic surgery, residency, education, Kolb learning style inventory, residents, applicants

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills

INTRODUCTION

With work-hour restrictions and increased faculty workload, residency programs must optimize time for education. To educate surgeons effectively, it is important to understand how they learn. Learning is the process by which one acquires new skills and permanently changes behavior through cognitive and noncognitive (affective) experiences.¹

Learning styles have been analyzed in numerous medical specialties.^{7,8,12-16} In addition to variation across specialties, there appears to be a difference in learning styles between junior and senior residents within the same specialty. An understanding of learning styles allows programs to potentially identify those incoming residents at risk of underperforming in surgical skill acquisition and makes academic teaching more effective.¹⁴ Such awareness can maximize the learning process for residents and students, allowing the learner to tailor his educational approach to that of the program or instructor.

A popular and validated method of assessing learning is the Kolb Learning Style Inventory (LSI), which allows comparisons of learning styles across medical specialties and between training levels.^{2,3} It measures both an individual's learning potential when placed in different environments and his learning style when challenged to acquire new material.⁹ This method is based on the theory of experiential learning, separating learners based on the y -axis of

Correspondence Inquiries to: Raveesh Daniel Richard, Department of Orthopaedic Surgery, Geisinger Health System, Danville, Pennsylvania 17822; e-mail: rdrichard@geisinger.edu

information perception (learning by experience or thinking) and the *x*-axis of information processing (learning by doing or reflecting). Learning is thus divided into 4 stages: active experimentation (AE) (doing), abstract conceptualization (AC) (thinking), concrete experience (CE) (watching), and reflective observation (RO) (feeling).⁴ Ideal learning incorporates all 4 components, but individuals tend to have stronger preferences toward specific methods. Kolb established 4 categories of learning styles: diverging, assimilating, converging, and accommodating.⁵⁻⁷

“Convergers” utilize the strategies of AC and AE.^{5,8,9} Dominant learning styles within this group involve problem solving and decision making, with the practical application of ideas and the use of hypothetical-deductive reasoning.^{5,7,10} These individuals are relatively unemotional, preferring to deal with things rather than people, have narrow technical interests, and often are involved with engineering.^{1,7,11}

“Accommodators” utilize the strategies of CE and AE.^{5,8,9} These learners tend to be action oriented and intimately involved with challenges, adapting quickly to varying situations by combining experience and doing.^{5,9,11} These individuals are viewed as risk-takers, relying on others for information, and are often found in action-oriented jobs such as marketing or sales.^{1,7,11}

“Divergers” utilize the strategies of CE and RO.^{5,8,9} Observation is preferred over action, with brainstorming and the application of prior experience used to problem solve.^{5,9,10} These individuals enjoy working with groups, view concrete situations from multiple perspectives, are imaginative and emotional, and tend to be those who specialize in the liberal arts.^{1,7,8,11}

“Assimilators” utilize the strategies of AC and RO.^{5,8,9} These learners place a heavy emphasis on logic and theory and are skilled at integrating large amounts of information to create smaller, succinct ideas.^{5,8-10} These individuals enjoy reading and lectures, are less interested in people and more concerned with abstract concepts, and are often found in the applied sciences and research departments.^{1,5,7,11}

To our knowledge, there has been no previous study conducted in the United States where the learning styles of orthopedic applicants, residents, and faculty have been examined. We assessed the predominant learning styles of these 3 groups at an orthopedic residency program. Our hypothesis was that the converging and accommodating learning styles would be most prevalent among the orthopedic residency applicants, residents, and faculty members.

MATERIAL AND METHODS

This study was prospectively conducted at an east-coast academic center after institutional review board (IRB) exemption status was obtained. Information sheets regarding the study, Kolb LSI surveys, and a demographic

questionnaire were distributed to all residency applicants on the day of their interview ($n = 60$). Similarly, current orthopedic residents ($n = 14$) and core orthopedic faculty ($n = 16$) were given the same packet of information and surveys.

The information sheet given to the participants in the study included material regarding the purpose of the study and assurances that the survey was voluntary and refusal to participate would not affect employment or chances of obtaining a residency position. A minimal amount of information regarding learning styles was given to limit any bias prior to completion of the Kolb LSI questionnaire. Demographic information collected included age, sex, type of medical school (MD or DO), foreign medical graduate (FMG) status, year since college graduation, postgraduate year level (residents only), and years since completion of residency (faculty only). All participants were given the opportunity to ask questions regarding the study. A total of 90 Kolb LSI surveys and demographic questionnaires were distributed among the applicants, residents, and faculty.

The LSI consisted of 12 items composed of 4 different statements, each representing one of the 4 elements of the learning process. The total scores for each of the 4 elements of the learning process (AE, CE, RO, and AC) were compiled, ranging from 12 to 48. Using a Cartesian graph, AE minus RO was plotted on the *x*-axis (range, -36 to $+36$), whereas AC minus CE was plotted on the *y*-axis (range, -36 to $+36$) (Figs. 1-4).

The Fisher exact test was used to determine whether the differences in the overall distribution of percentages observed (overall 4 learning style categories) were representative of significant differences between the subgroups (applicants, residents, and faculty) in the general population. Logistic regression was used to estimate the proportions and confidence intervals of each learning style, overall and within subgroups. The *p*-values reflect whether the proportions in each subgroup were significantly different from a baseline comparison subgroup. For group type, “residents” was used as the baseline comparison group, and for age group, “26 years and under” was used as the baseline comparison group (Table 3). *p*-values were also adjusted for the multiple comparisons made within each category.

RESULTS

Seventy-one of the 90 surveys (78.9%) were correctly completed. Of 71 respondents, sixty-five (92%) were men, 66 (93%) had MD degrees, and there were 43 (61%) applicants, 14 (20%) residents, and 14 (20%) faculty. None of the respondents were FMGs. The mean age was 31 years (range, 23-64), mean time since graduation was 10 years (range, 4-43), and mean time since residency was 17 years (range, 3-33). The demographic data and Kolb

Download English Version:

<https://daneshyari.com/en/article/4297643>

Download Persian Version:

<https://daneshyari.com/article/4297643>

[Daneshyari.com](https://daneshyari.com)