Experiential learning through a health professional shadowing program

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ABSTRACT

Pre-health science students need experiential activities to complement the lectures in their undergraduate curriculum. As a result, the Whittier College Health Professional Shadowing Program was initiated to provide a short-term exploratory experience for lower division students. Health professionals were recruited by a survey of physician alumni and through referrals from College staff. Professionals from nine fields were included but most of the two-hour appointments were with physicians and pharmacists. Participation in the program and the follow-up evaluation allowed students to have an effective learning experience according to current learning theories. In the first five years, 75 students participated in the program with 105 visits to offices of health professionals. The success of the program was assessed through two surveys of current student and alumni participants and yielded a total response rate of 56 percent. Responders compared their personal skills to those needed by a professional in the field shadowed and commented on actions that they would need to take to better prepare themselves for the field. The survey also demonstrated the value of the program, as nearly 25 percent noted that the shadowing experience helped them determine that they did not want to pursue a career in the field shadowed. In contrast, 38 percent noted that the experience confirmed their desire for a career in the field shadowed. The differences in the survey outcomes between the current students and the alumni seemed to reflect that the alumni had a more realistic understanding of their own personal strengths and those needed for the profession. This may have been a result of the fact that many were already in professional school in the field in which they had the shadowing experience. (Journal of Cooperative Education & Internships, 2010, 44(1), 34-41).

KEY WORDS: experiential learning, job shadowing, Kolb learning cycle, pre-health education

Many freshmen who are studying in the pre-health sciences come to college with strong ideas about their future careers. These ideas are often based on success in science coursework, encouragement from high school advisers, and a strong personal sense of self confidence. Their ideas about the practice of medicine are shaped by the media and personal or family experiences. College provides a number of classroom learning experiences that can be described as information assimilation (Coleman, 1976). Learning from conventional classroom lectures is described by Coleman as involving four steps: information reception, assimilation, application and finally, action. In contrast, experiential learning is anchored in action leading to assimilation and understanding. While John Dewey was one of the early advocates for the experiential approach to learning, noting that all learning is experiential (Dewey, 1938), David Kolb's seminal work in 1984 forms the basis of most recent discussion of this approach. His four step cycle of learning involving Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation (Kolb, 1984) has become the foundation of most work in this area.

When enhancing the experiential education of pre-health students in science, a number of options need to be considered. The three main types of experiences, according to Kendal, Duley, Little, Permaul and Rubin (1986), are discrete, academic-course based, and other general activity. The discrete type involves formal programs like internships, service learning, shadowing, and fieldwork. Academic course-based work includes field trips, and participatory observations, while the last category incorporates laboratory work, role playing, and student-led activities (Kendall et al., 1986). All health professional schools expect their matriculates to have experience in the field. Participation in an introductory experiential program would enable students to experience valuable learning as well as meet a requirement for their post graduate schooling.

The value of experiential learning in medicine is well established. In recent years, experiential techniques have been integrated into the medical school curricula with experiences in problem-based learning, small group learning, portfolios, and practice-based learning (Stanton & Grant, 1999). Some medical schools have also run their own shadowing days (SUNY Upstate Medical College, n.d.). At the undergraduate level, formal, structured shadowing

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programs exist at a number of the larger public institutions (Indiana University, n.d., Cameron University, n.d, University of Missouri, n.d.). This article describes the development of an exploratory short-term experiential shadowing program which provides opportunities for students to explore selected medical fields and to develop a deeper understanding of their preferred field of interest. In addition, students make connections with potential mentors in the field, enabling them to have a longer, more intensive experience.

Many students coming to college have a preliminary desire to become physicians but have little or no familiarity with other fields of medicine. The precipitous drop of interest in medicine as a career following the freshman year (sometimes as much as 90% by graduation) stimulated the formation of this exploratory program. It was designed to help redirect students' health career interests across a wider choice of options. The program has two main objectives: career confirming experiences and opportunities to explore other fields to enable a broader, more informed career choice. The success of the program would be gauged by an increase in students changing career direction subsequent to participation in the program as well as an increase in those who expressed a confirmation of their career choice.

METHODS

The information on Table 1 below includes the entire pool of students (N=75) and describes the data on 105 student appointments. The students may be counted more than once due to participating in more than one year. The program was available to all students and invitations to the training session were sent by email to all students who were on file with the Health Sciences Advisory Council. Announcements were also made by the faculty in lower division classes in Biology, Chemistry, Physics and Psychology. Follow-up surveys were obtained from 21 current students and 21 alumni who had participated in the shadowing program, a 56 percent response rate for the entire pool. The current student response rate was 78 percent (N=27) and that of the alumni was 44 percent (N=48). In both cases, students who shadowed more than one field filled out more than one survey to reflect their experiences. A total of 47 surveys were completed.

The program was designed originally with lower division students in mind but upper division students were not excluded. The breakdown of students utilizing the program is noted in Tables 1 and 2. On Table 1 it is apparent that the physicians were most commonly shadowed, but in recent years the pharmacists were also frequently requested. The gender balance and ethnicity profile varied from the initial participants to the responder groups as seen in Table 2. Eighteen students of the 75 had multiple appointments (24%) and twelve of them participated in multiple years. In addition, ten students shadowed more than one practitioner in the same field.

Since the program was designed to be exploratory, a minimal time commitment was required for both the practitioner and student. Two-hour time blocks were arranged through the program assistant and confirmed with the staff in the office of the health professional. The students were trained on professional behavior and confidentiality at an introductory session. Materials for the training were assembled from a variety of sources on the internet and local health clinic staff training materials. Confidentiality and behavior agreements were discussed and signed as part of the application to the program. After the matching of the student to the professional, an email was sent with directions and contact phone numbers to enable the student to let the practitioners' offices know if a change was necessitated. Upon the return of the student, an initial evaluation was completed and the opportunity to be matched with another practitioner of the same or different field was offered. Health professionals were recruited in a variety of ways. In the first year of the program, physicians were recruited from an alumni survey of health professionals in the area near the College. In addition, since Whittier College has 29 percent Hispanic students and is classified by the Department of Education as a Hispanic Serving Institution, local Hispanic physicians were also contacted. Additional physician mentors were recruited through referrals from faculty and staff at the College. In the initial years, physicians from Alta Med Medical Group were part of the program and later, physicians from Bright Medical Group also participated. In the second year, the program was expanded to include a broader list of fields whose professionals were recruited through recommendations of faculty and staff from the College. Through these contacts, the program grew to include six physicians, four pharmacists, two veterinary offices, three dentists, two optometrists and a physician assistant. The third year saw the addition of a chiropractor and, in subsequent years, a nurse practitioner and a podiatrist were added.

TABLE 1
Class and field distributions of participants in the shadowing program 2004-2009

Class	Nº of students	Percentage of Field Shadowed						
		Physician	Pharmacy	Optometry	Dentistry	Physician Assistant	Veterinary	Nursing
Freshman	32	53%	22%	12%	6%	3%	3%	3%
Sophomore	25	53%	23%	3%	13%	6%	3%	
Junior	14	32%	32%	9%	18%	18%		
Senior	11	42%	36%	14%		7%		

TABLE 2
Gender and ethnicity percentage distribution of the participants in the overall program and the survey responders

	Male	Fem	N.Am	Asian	Af. Am	Hisp.	White	Other
Total participants N=75	21%	79%	1%	12%	4%	35%	47%	1%
Current student responders N=21	24%	76%	5%	19%		48%	28%	
Alumni Responders N=21	48%	52%		9%	5%	19%	62%	5%

In the spring of 2010, two evaluation surveys were constructed to allow for a greater amount of reflection by the current student and alumni participants. Each survey was designed by the author in consultation with Susana Santos, a colleague trained in assessment techniques and no other scales or guides were used. The form of both surveys was crafted with the goal of prompting student reflection on three things. First, the survey asked students about the skills that were needed and demonstrated by the professionals in their shadowed fields. Then, the survey asked students to assess their own fit for those fields. Last, several open-ended questions were asked of each group of participants. The first survey was sent to students who were still enrolled at the College and had not yet begun their careers (current students). The other survey was sent to alumni who had participated in the program while they were undergraduates. In each survey, demographic information was collected as well as the field shadowed.

The first section, included on both surveys, was a table of the Health Professions Characteristic Inventory (HPCI). The items in the table were written as statements about specific skills and characteristics that the students might have observed in the health professionals during their shadowing experience or believed were true of professionals in the field (See Table 3 for the statements). Four response levels were designed to gauge students' agreement with these statements (strongly agree, agree, disagree, and strongly disagree). Matched to the statements about the practitioner were statements about each student's own skills, found in a second table. The means of the students' responses are summarized in Table 3 in the columns entitled Personal Health Professional Skills Inventory (PHPSI). Again, students were prompted to evaluate their agreement with the statement using the same four level scale. In addition to the objective questions, open-ended questions asked students to reflect on their experience, what they learned they needed to do to better prepare for a career in the field, and the impact of their experience on their thinking about their careers. The students were also asked about the most important and the least important aspects of the program, how long they had been interested in the field shadowed, if they had ever been interested in another field, and what it was. The alumni survey also included open-ended questions that asked about what they wished they had done to better prepare for their

present activities and the impact of the *Shadowing Program* on their current career. Finally, the survey provided a space for other comments.

The objective rankings were analyzed with PASW Statistics 17.0, and the comments on the open-ended questions were grouped and tabulated by the author according to the key words in the student response and the general topic addressed. The sorting was not verified by others.

RESULTS

Results of the Objective Statements from the Survey

The means of the objective responses from each administration are combined in Table 3 and arranged to make the pairing of statements in the Health Professional Characteristics Inventory (HPCI) and Personal Health Professions Skills Inventory (PHPSI) for each group of participants clear. The columns reflect the averages of the responses from the current student survey and the alumni survey. The response key was 4= strongly agree, 3=agree, 2=disagree and 1 =strongly disagree, so averages in the range around 3-4 signifies some degree of agreement for most respondents. Several statements on the bottom of the table were not included in both surveys due to the nature of the statement being made and the participants surveyed. The shaded boxes highlight the statements which yielded the highest average in the column.

Current students evaluated their own skills differently from that needed by a health professional in the matched questions on Table 3. The positive sign in the difference column indicates that the responder ranked themselves (PHPSI) higher in statements about themselves than they observed in the practitioner. This occurs to the greatest degree of difference in the means of current students in statements about the role of stress in their lives and that of the practitioner (+.63) as well the role of structure in work hours (+.42). Paired t tests on these two sets of means showed significant differences (t=-2.901, p = .057 for the stress statement and t=-2.005, p=.057 for the hours statement). The only large negative difference in the results of the current student survey occurred in statements about clinical skills, where the students, on average, disagreed that they had strong clinical skills (-.99) and a paired t test also showed significance (t=5.627, p=0.000). This statement served as a check in the current student survey and resulted in the lowest overall mean score on either survey (2.71). The alumni response differences were generally lower than those of the current students, with a maximum positive difference of .40 and .39 for statements about computer use and independent decision making. Only the latter showed a marginally significant ranking difference between the HPCI and PHPSI statements (t=2.021, p=.056). This may be a result of personal experience by the alumni in their later years, more than reflecting their opinion at the point of the shadowing experience.

In Table 3 the Health Professional Characteristics Inventory of the current students is listed in decreasing rank order. By comparing the statements with shaded averages for each section it is apparent that the current students and alumni responders accorded a different degree of agreement on various topics. While current students ranked the importance of communication with diverse populations by professionals highly as well as the importance of making patients comfortable, the alumni emphasized general communication skills along with the importance of making patients comfortable. When ranking their personal skills, there were some differences in emphases as well. Here, the current students most strongly agreed with statements about wanting independent decision making in their career and knowing how to make people comfortable; while the alumni also strongly agreed that they knew how to make people feel comfortable and that they used computers effectively.

When the responses of the current students and those of the alumni are combined, several significant differences are noted. The females had higher agreement levels than those of the males in 19 of the 21 statements. In addition, ANOVA analysis, controlling for ethnicity, demonstrated that women agreed significantly more strongly than men with statements that professionals need strong problem solving skills (F[1, 42] = 7.188, p=.011) and that they need to communicate with diverse populations effectively (F [1, 42] = 4.856, p=.034). Ethnicity was shown by ANOVA analysis to be significantly different in the statement about the ability of the responder to deal with stress (F [1, 42] = 3.321, p=.047).

TABLE 3
Mean Scores of the Characteristics of the Health Professional Shadowed and Matched statements from the Personal Skills Inventory of Current Students and Alumni. (Gray shaded entries signify responses of highest agreement.)

Health Professional Characteristics Inventory	Personal Health Professions Skills Inventory	Current Students			Alumni		
HPCI	PHPSI	HPCI	PHPSI	Diff	HPCI	PHPSI	Diff
Professionals in this field are required to communicate with diverse populations of patients.	I communicate effectively with diverse populations of patients.	3.75	3.58	-.17	3.48	3.26	-.22
Professionals in this field make their patients feel comfortable.	I know how to make people feel comfortable.	3.75	3.54	-.21	3.65	3.61	-.04
Professionals in this field have strong clinical skills	I have strong clinical skills in the field I shadowed	3.70	2.71	-.99	No analogous Question		
Professionals in this field have to problem-solve effectively in patient treatment.	I am a good problem solver.	3.58	3.50	-.08	3.30	3.43	+.13
Professionals in this field need strong communication skills.	I have strong communication skills.	3.54	3.33	-.21	3.78	3.52	-.26
Professionals in this field take enough time to interact with the patient	No analogous question	3.46	No analogous question		2.61	No analogous question	
Professionals in this field seem to be independent in making decisions.	I want to be independent in making decisions in my career.	3.41	3.63	+.22	2.87	3.26	+.39
Professionals in this field need to use computers effectively.	I effectively use computers.	3.30	3.37	+.07	3.34	3.74	+.40
Professionals in this field work structured hours (i.e. 9-5).	I can function well without structured hours (i.e. 9-5).	3.04	3.46	+.42	3.00	2.70	-.30
Professionals in this field have a work environment was very stressful.	I deal with stress effectively.	2.87	3.50	+.63	3.00	3.17	+.17
No analogous question	I have strong leadership skills					3.26	
No analogous question	I can make people feel comfortable.		3.50			3.57	
No analogous question	I work well without direction.		3.33			3.22	

Results of Open-ended Questions

The current students were asked where they needed to improve their skills and the most common response was "to strengthen their communication skills." "Problem solving abilities," "becoming more independent in decision making," and "working with diverse and trying patients" were also mentioned repeatedly. When asked about the most important thing they learned from the experience, students mentioned "confirming their career decision" (29%) and "answering specific questions." Additionally, 20 percent learned that the field in which they shadowed was not one

they would want for a career. Two other findings gleaned from current students' comments were "the enhancement of their knowledge of the field" and their "need for strong people skills." The students determined that they needed to "pursue activities that strengthened their communication skills" as well as to "learn more theory in the field" to be effective practitioners.

Since one goal of the program was to confirm the field choice of the participants or help them decide to change their choice, it is interesting that about a third of the students had been interested in the field of their shadowing experience since before high school while another third had become interested in it in the last two years. An exploratory experience would be helpful especially for those who are still thinking about their choice. In addition, half of the students had considered health fields other than the one shadowed, implying that they were using the experience to explore and confirm their present choice. Of the alumni responders, 14 out of 21 were pursuing health field careers. They noted that their shadowing experience confirmed their choice of career (48%) as well as indicating the shadowing program helped them decide not to pursue the field shadowed (24%). These data, along with those from the current student responders, strongly affirms that the goals of the program were being met. The alumni responders expressed a wish that they had shadowed more and earlier as well as taken different classes (especially Spanish). Several in pharmacy school noted they should have progressed from shadowing to a job in the field before they started graduate school. The real-world aspects of practicing medicine, especially the less attractive ones (counting pills, paperwork, overwork, understaffing etc.) were cited by many of the alumni as impacting strongly on them.

DISCUSSION

The students involved in the *Shadowing Program* reflect, to some degree, the demographics of the liberal arts college. While liberal arts colleges have a predominance of women in their student body, (Whittier has averaged 53% female in 2005-10) the woman were much more active in participating in the *Shadowing Program* (71%). The proportion of Hispanic individuals in the shadowing group (35%) was higher than the proportion in the student body (29%) and reflects the emphasis of the College on recruiting pre-health students in science from this group.

The paired responses in the current student survey demonstrated that the students noted areas of improvement that they needed. These were reflected in a negative sign of the difference between the HPCI and PHPSI columns on Table 3. The areas that students recognized for improvement were in the areas of clinical skills and communication with various populations. Similar areas also showed up in their answers to the open-ended questions. On the other hand, undergraduates seem to over-estimate their ability to gauge their facility with stress, or, even more likely, they were unable to estimate the stressors on the practitioners that they shadowed and so agreed less emphatically with the statement on the HPCI table. The desire of undergraduate students to have independent decision-making in their careers and unstructured hours is an expected outcome of their desire to escape from the structure of school life. The alumni responses on the paired statements were generally similar for both their self analysis and that of their perception of the characteristics of the health professional, leading to the similarity of the results. This is likely to be due to the fact that many of the alumni participants were well into the profession that they had shadowed and, although asked to project back to their self knowledge at the time of the shadowing experience, might have been influenced by their present state of personal skills. It is also possible that those who pursued the field actively into a career had a better congruence with the needed skills when they were in the *Shadowing Program*.

The current students evidenced differences in their responses to the objective parts of the survey when compared to the alumni. Their rankings for the characteristics of the health professional showed that they put less emphasis on communication skills and working with people than the measurable aspects of the career (hours and computers). This was in contrast to the alumni, two thirds of whom were in training for health careers or practicing in them. Presumably, the alumni were more aware of technology changes in the field, whereas the undergraduates experienced a more limited personal perception of the field.

It is also of note that the alumni were less positive about the ability of health professionals to make their own decisions and to have enough time to meet with patients. This may be a result of the high number of alumni who are practicing in the field in which they had shadowed and the greater experience they have as a result. It is also interesting that the alumni scored their tolerance for unstructured hours lower than that of the current students and this is consistent with the more flexible lifestyles of college students. The high agreement responses of the females in this study compared to

the males may have been due to motivational factors as a result of an increased sensitivity to the factors related to the field or possibly to an increased level of awe in the experience of the field for the first time. The differences may be due, as well, to perception differences between the groups of responders.

The answers to the open-ended question section of the evaluation affirm the value of the shadowing experience for the students. The test for a good exploratory program is when it changes the actions of its participants. After the experience, nearly 25 percent of the survey responders indicated that they had changed their minds about pursuing a career in the field that they shadowed. Those who changed their career choice as a result of the shadowing experience had shadowed doctors, dentists, and pharmacists and with one exception, decided to pursue careers outside of medicine. Additionally, the previously held opinions of nearly 38 percent of the total responders were confirmed and broadened through the program. While only 24 percent shadowed more than once, the need to do more shadowing came through strongly in the comments of the alumni and from some of the current students. Also, two thirds of the current students who filled out the survey expressed a desire for a more extended shadowing experience.

Communication and language skills were issues commented on in both the current student and alumni surveys. The practitioners in the *Shadowing Program* have large numbers of Spanish-speaking patients. In fact, in the early years there were two physicians and one dentist who required Spanish fluency of the students who shadowed with them to ensure the best experience. Whittier College now includes introductory foreign language study as an optional part of the liberal arts curriculum for graduation and this may increase the numbers of Spanish-knowledgeable students in the program. While communication in symbols (mathematics) and writing are emphases in liberal arts curricula, no specific courses in verbal personal communication skills are required in the curriculum.

The components of the *Shadowing Program* are congruent with Kolb's Experiential Learning cycle (Kolb, 1984). The students have a concrete experience in a field for which they have an interest through the initial shadowing appointment. They are actively involved in observing and questioning their experience through the interaction with the physician and patients. The evaluation after the experience allows them to reflect on the experience and to determine the impact it had on their thinking about their careers. Additionally, they will reflect on the experience when applying for additional shadowing opportunities. Reflection and processing of the experience are important parts of the program. The processing of their own skill levels and those needed for their field allows them to undergo Abstract Conceptualization (thinking things through) and then Active Experimentation begins again with the processing of the next steps to their career goal. This latter step might lead, as it did for several of the students, into exploring a longer term shadowing experience or into a paying job with a practitioner from the program.

Meaningful learning occurred through the experience of medicine in the real-world. Fiddler and Marienau (2008) noted that questioning one's beliefs and values is a component of a meaningful learning experience and both current students and alumni commented on how their assumptions about medicine changed as a result of the experience. Several respondents expressed surprise in the less positive aspects they experienced through the program (amount of paperwork, language difficulties etc.) but were undeterred in their interest in the field. Kennedy, Ward, and Milne (2010) also noted that self assessment both empowers and ensures that the learning experience is more meaningful. The evaluation involved thinking through one's personal abilities and comparing them to those needed by professionals in the field. The follow-up question on actions to be taken, or in the case of the alumni, actions they could have taken, led to better personal understanding of the Experimental Action needed next.

In knowledge development, learners must engage in relationships and relationship building (Jones and Quick, 2006). Through the shadowing experience, a number of students developed on-going relationships with the practitioners through longer shadowing experiences with the same individual and, in some cases, paying positions. Some of the practitioner participants of the program have served on panels and attended dinners with students, providing another way for students to develop relationships with them. One dental student even joined her shadowed dentist in mentoring some elementary school students.

CONCLUSION

Experiential learning opportunities are needed to complement the more classroom-based experiences in the preparation of pre-health students in science. This short term *Shadowing Program* has been shown to be effective in influencing the career choice of nearly 63 percent of those participating in the program. In over a third, their interest was confirmed and

a quarter of them were directed away from health careers. This latter group determined their need to change their plans after only one shadowing experience. This implies that a short term experience conserves the time of both students and professionals. The program could be enhanced by better advertising to the lower-division students to plan their involvement earlier in their academic careers. Additionally, encouraging more frequent shadowing appointments would provide for them a broader perspective on the field of interest through the opportunity to shadow with different specialties (surgery, ophthalmology, internal medicine, etc.). Discussions are underway to expand the program to include a more structured semester or year-long duration. This would allow the participation of some of the alumni who are in medical practices that require intensive training sessions before shadowing is permitted. It would also contribute to the need of students for a more intensive experience to meet graduate entrance requirements.

Other fields can also benefit from development of a short term shadowing program. Alumni from a variety of fields have been available for on-campus panels and mentoring, shown in this study to be portals to the development of a shadowing program. Early experiential activities in business, technology fields, and teaching, for example, would enable students to make more informed career choices. The lower time commitment on the part of all participants makes this kind of program an attractive and potentially life-changing option for students in health science and other fields.

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