Making Connections:

USING SKILL THEORY *to* RECOGNIZE HOW STUDENTS BUILD *and* REBUILD UNDERSTANDING

In this companion to Marc Schwartz and Kurt Fischer's article, Patricia King and JoNes VanHecke describe how student affairs educators can help students become sophisticated thinkers.

BY PATRICIA M. KING AND JONES R. VANHECKE

"LEARNING IS fundamentally about making and maintaining connections: biologically through neural networks; mentally among concepts, ideas, and meanings; and experientially through interaction between the mind and the environment, self and other, generality and context, deliberation and action" (p. 11). Susan Engelkemeyer and Scott Brown present this description in their summary of the 1998 Powerful Partnerships report. Indeed, the importance of learning to make connections is reflected in the fact that it is the first learning principle cited in that national report. Lee Shulman, president of the Carnegie Foundation for the Advancement of Teaching, also comments on the central role of making connections in his discussion of educational experiences that help students make sense of their own experience: "One of the central ways we make sense of experience is by making differences" (p. 37). He is referring to the value of attending to the categories and distinctions that help us organize our thinking about ideas, concepts, and observed relationships among people and things, thus illuminating the connections between and among the categories we have chosen in order to make sense of our experience.

Despite the importance accorded to helping students make conceptual connections and arrive at a more sophisticated understanding of how ideas, concepts, theories, and explanations interact with and inform one another, educators have few maps to help them describe the process by which students learn to make these connections. Through skill theory, Kurt Fischer provides a way of understanding how the capacity to discern relationships in more abstract, inclusive, and intellectually insightful ways develops. With a deeper understanding of these developmental processes, educators will be better able to create experiences that support students in making connections and better able to assess their progress along the way.

Student affairs personnel are often in an especially good position to assist students in building and rebuilding connections as they move toward more complex and effective ways of thinking. For example, student affairs staff members often interact with students during times of personal transition, when students are often more open to examining questions about what they are doing and with whom, where they are going, how best to get there, and paths not chosen. Student affairs personnel also have the advantage of hearing students' uncensored reactions to classes, to campus events and issues, and to interactions with friends, family, staff members, and professors and therefore have a deeper understanding of the way students understand their experiences. In addition, student affairs educators are often comfortable with dealing with students' feelings and emotional reactions, which is essential when the educational connection being made is between a student's feelings, thoughts, and behaviors, a connection that requires a different kind of support than attending to thoughts alone. Kurt Fischer and L. Todd Rose point out that "variations in a student's learning are function(s) of the student's emotional state and how much immediate support the student receives" (p. 6).

Constructing critical connections is by no means automatic or easy for students. Consider the following two examples of how students have reflected on their collegiate experiences. These excerpts are taken from interviews conducted as part of the Wabash National Study of Liberal Arts Education.

INTERVIEWER (after an extended conversation in which the student recounted her most important collegiate experiences): We've talked about [your] important [college] experiences. How do you feel like you've internalized all these experiences, and how do they shape you, who you are right now?

STUDENT: They haven't really changed me. I mean, I'm who I am because I, you know, just because of me, not . . . ; it [college] hasn't really changed me. I'm still the same person.

INTERVIEWER: OK. Do you think that you've gained any insights that you might be able to apply to your daily life?

STUDENT: Not really; I mean, my daily life, it's the same as what it's always been—just I'm going to school now, and it's not different than what it's been before, other than I'm not working, I'm going to school instead.

Although this student had just recounted what she selected as important collegiate experiences, she did not report seeing connections between those experiences and who she is or how she lives her daily life.

Another undergraduate, however, made many connections from her collegiate experiences and was able to articulate relationships between educational opportunities and responsibilities and between her insights about the world and her efforts to be a good citizen.

STUDENT: I am grateful for the opportunities that I had, and I feel as though given the opportunities that I had, it comes along with responsibility, and it's not a burden so much as a responsibility that I want to take on. I think that you have to create the world in which you wish to live. And a world with inequities at the level that they are currently is not a world I wish to live in, and it's not going to change itself, and so I'm going to change it. You know, and I can't change it on my own, and I can't change it enough, but I can at least make efforts and do my part so that I can at least be a citizen as I see citizens should be.

These two students illustrate radically different levels of connection making. What accounts for these differences? How can educators work with students to increase their ability to reflect on their collegiate experiences in meaningful ways? In this article, we examine how students move from seeing experiences in discrete units to seeing the connections between and among them. This article is intended as a companion to the one by Marc Schwartz and Kurt Fischer in this issue. Both pieces are grounded in the concepts of skill theory; they differ in that the major focus of Schwartz and Fischer's article is classroom contexts, whereas the focus of this one is cocurricular contexts. We agree with Mary Huber and Pat Hutchings and with William Newell that integrating information and ideas is an important student outcome. Educators working toward this goal are served by more fully understanding how thinking in late adolescents and adults evolves and how to help college students better integrate, synthesize, and use the wealth of information and perspectives available to them.

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MAJOR TENETS OF SKILL THEORY

KURT FISCHER'S skill theory provides a life-span view of cognitive development. (See the "Additional Skill Theory Resources" at the end of this article for more information on skill theory.) Fischer and his colleagues have described a progression of cognitive complexity in the ways people think and reason. The theory includes seven developmental levels that emerge between ages two and thirty and are clustered into two overlapping tiers. The representational tier focuses on individuals' ability to manipulate concrete representations, objects, people, or events; the abstract tier focuses on individuals' ability to integrate, manipulate, and reason using abstract concepts.

Each step of the progression reflects an improved capacity to see relationships and make connections between and among objects and ideas. Karen Kitchener and Kurt Fischer present this visually as a figure that progresses from a single dot (representing a skill) to two dots, to two dots connected by a line (representing coordination of two skills), to a rectangle, to two rectangles, to two rectangles connected by a line, and so forth, culminating in clusters of cubes connected by several lines. This progression shows how students learn to connect less complex skills into increasingly comprehensive skill sets. For example, as students learn to build their own arguments and make their own judgments, they may begin by collecting facts (dots), noting that some facts bolster others (lines between dots), that different people hold different opinions for different reasons (rectangles), and that the same data can be used in the service of different conclusions (lines between rectangles). These steps show increasing ability to discern and construct relationships among facts, observations, values, interpretations, conclusions, and so on. When their skills reach the abstract tier, people have the capacity to see the relationships among coordinated perspectives, or systems of systems.

The skills associated with the abstract tier reflect the developmental capacities of most college students. When a person is coordinating two simpler concepts into a more complex understanding, a substantial change in thought occurs when the individual understands the relationship between two abstract concepts rather than considering the concepts to be separate and independent, a hallmark of the skills of this tier. For example, students who can discern the relationship between racism and white privilege are better prepared to understand intergroup dynamics than are those who see them as independent concepts. Similarly, students who change their view of the process of creating community norms in a residence hall from simply following given rules or expectations of a specific hall to learning how to nondefensively state one's own interests, fairly negotiate different interests, and take into account the needs of others will have a broader repertoire of skills to apply to their living situations in the future. Such changes aren't typically visible as sudden, permanent flashes of insight; instead, students often vacillate between new and old ways of understanding before they consolidate a stable skill. Seeing such vacillation may be frustrating for educators who initially celebrated the preliminary breakthrough of understanding; knowing that vacillation is common and predictable may help them to be more patient as the skill is consolidated. English professor Barry Kroll describes a strategy he has used under such circumstances: "When their responses are dogmatic, I foster all their doubts; when mired in skepticism or paralyzed by complexity, I push them to make judgments; when their tactics are not fully reflective, I encourage their best efforts to use critical, interrogative, or evaluative thinking" (p. 13).

Understanding two other key features of skill theory—developmental range and webs of development—can also help educators understand differences in students' responses and reactions to collegiate experiences.

Developmental Range: From Functional to Optimal Performance Level. A distinguishing feature of Fischer's skill theory is the explicit acknowledgment that performance (demonstrating one's skills) is affected by context; thus, no individual operates at any one developmental level in all settings and under all circumstances. The assumptions that individuals operate

within a range of performance levels rather than at a single level and that performance can be affected by task or support distinctions undergird Fischer's theory.

In skill theory, two levels of performance, the functional level and the optimal level, define each individual's range of development and skill ability. The functional level represents a student's typical or everyday performance, while the optimal level represents his or her best performance under ideal conditions. Under conditions of low support, students function less skillfully and perform at their functional level, which is adequate for their everyday functioning but does not demonstrate their full potential. When students receive high support, however, they can perform at their optimal level, demonstrating their best possible performance. This high competence occurs more readily when there are prompts to produce key components of the task at hand.

Consider Sherry, a highly engaged, high-achieving high school senior who played two sports, got straight A's, volunteered at the local elder care facility, and was president of the student government. However, when she arrived on campus as a first-year student, she hesitated to get involved at all. At college for the first time, she expressed concern about being engaged with anything beyond the minimal requirements during her first months or even years of college, despite having been a superstar in high school. While this was an effective adjustment strategy for her, it also illustrates the differences between functional and optimal performance. As a high school senior, Sherry was at the top of her game. She had a well-established support system and knew how to navigate the multiple demands of a full high school schedule. Under these circumstances, she could operate at a high level of competence, her optimal level. As a first-year college student, however, she lacked knowledge of resources for assistance with new challenges, reverted to safer ground by operating in a smaller social circle, and was afraid to get involved. Under these conditions, she operated closer to her functional level. This seeming regression is common when college students are dealing with new situations. James Parziale and

Kurt Fischer note, "When people find themselves in a new situation, they can maintain the higher levels of thinking complexity that they can use in familiar domains. They efficiently adjust the complexity of their thinking to the point where what they do in the new situation matches the complexity of the way they can think about the new situation" (p. 109).

The range in performance between functional and optimal levels, which can be sizable, is called *developmental range.* Recognizing this range, an educator's goal is not only to improve student performance but, more specifically, to improve functional-level performance while targeting optimal-level skill development through challenge and support.

Education involves providing learning environments in which students can produce a skill or series of skills on their own and simultaneously targeting optimal-level performance. When students experience optimal-level skill performance with the aid of high support, they often strive to achieve it again because they know it is possible to do so. To provide high support to Sherry, an educator might reinforce the basic skills of making good decisions, employing good study habits, coping with stress in healthy ways, developing meaningful relationships, and balancing priorities in order to assist her in continued improvement of performance at the functional level. Targeting optimal-level skill development might involve intentionally reaching out to engage her, setting appropriate but high expectations, and challenging her to perform at her very best.

Webs of Development. In addition to acknowledging that performance varies as a function of contextual support, skill theory also acknowledges that there are multiple means to develop a skill and that the routes to skill development may follow many interconnected strands that appear similar to a web. Consider an example of two roommates. Tyrone was a bright student who could readily master difficult new concepts and who dominated class discussions, but he became quiet and withdrawn during residence hall social programs. In contrast, Larry enthusiastically took responsibility for organizing his hall mates

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into study groups and arranging movie outings, but he struggled with his general education laboratory requirement. These two students embody the varied ways that students' attributes differ across academic and social domains and how the same skills and attributes, such as self-confidence, communication, and competence in interpersonal relationships, can be nurtured in different environments, following different strands of the web.

Or consider the many different approaches that students take in accessing college resources. Jesse experienced her first of many ongoing connections with the career center staff as a first-year student hoping to gain insight into her choice of major by taking a career interest inventory. Julie first used the career center as a sophomore seeking internship opportunities. Jim didn't grace the career center's front door until a week before the deadline for an important career fair he hoped to attend during his senior year. All three achieved the goal of learning about the career center and its many resources, but each did so in his or her own time and own way. In other words, the paths they followed toward this goal reflected different strategies, or different strands on the same web.

In addition to finding unique paths for traversing the web of development, students continually construct numerous new strands in their web, and each strand (or skill) contributes to the emergence of a more complex set of skills. A strand by itself might resemble a ladder of skills in a domain, but it branches and connects with other strands, resulting in a complex web of learning. The increased complexity of skill can be seen in the example of Ethan, who, looking for something fun to do during spring break of his sophomore year, decided to join a few friends on a college-sponsored work trip building a community center for a small town in the Appalachian mountains. The meaningful volunteer experience led Ethan to take on a leadership role for a subsequent spring-break work trip to aid in hurricane cleanup in his junior year. In his senior year, Ethan served as the student coordinator for the college's entire spring-break work trip program, organizing more than eight groups working at various sites around the United States.

PROGRAMS THAT HELP STUDENTS MAKE CONNECTIONS

THE CONCEPT of interconnected branches or strands within the web of educational experiences is an important one for faculty, staff, and administrators who work with students. Called upon to assist students in making connections across the domains, student affairs educators often have opportunities to reflect with students and pose questions that can challenge their thinking both in and outside the classroom. The hall director who invites faculty members and administrators in for fireside chats or informal social interaction as a part of residence hall programming and the assistant director of student activities who encourages the members of the student programming board to talk about what they're learning in their communications course and how it applies to the programming board group process are both examples of how educators in student affairs positions can make these connections more explicit for students. One of the most vivid illustrations of connections across branches is the example of Keith, a college student who struggled with career choices and his sense of purpose and identity while enrolled at an institution at which one of us (Van-Hecke) was employed as a student affairs educator. During his first years of college, Keith was singularly focused on medical school. An intellectually capable student, he had no problem mastering the coursework and maintaining excellent grades, and much of his collegiate engagement was directed toward completion of a successful medical school application. Keith performed well on the MCAT in the spring of his junior year, had some serious interest from several prestigious medical schools, and then spent the fall of his senior year on a study abroad program in India. When he returned to campus in the spring, our conversations were quite unlike those prior to his time in India. Before, we had talked about how to get into a good medical school or about some other internally focused college-related angst. After, he raised questions about his place in the larger commu-

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nity and the work he wanted to do. Keith knew he could succeed as a physician but began wondering whether he could serve his community in a different way. He talked about wanting to do more with his life, questioning who he was as a person. From such questions, it became apparent that his reflections were causing him to reconsider his career choice as he integrated this choice with a deeper understanding of himself. Keith decided to forgo medical school and instead accepted a position with a community agency doing advocacy work for the elderly. Today, he is passionate about affordable housing and homelessness and works tirelessly to make his corner of the world a little better. This may not have been the case had Keith not experienced the challenges of studying in India and had he not engaged in reflective conversations with campus faculty and staff members who supported his struggle and continued to challenge his thinking. For Keith, making a well-considered career choice resulted from connecting the way he thought about his career to the way he thought about his identity, a process triggered by his study abroad experience and reinforced by educators who encouraged him to wrestle honestly with his questions in order to arrive at a meaningful resolution. For others, this connection might be triggered by participating in an intergroup relations workshop, developing a question for a senior thesis, confronting another student about his or her behavior, or helping a friend in a time of need. In these cases, too, the availability of substantive support to address the questions that arise from students' experiences is key. Kurt Fischer and L. Todd Rose observe, "Students do not all learn in the same cookie-cutter fashion, and a dynamic analysis of learning and development provides powerful . . . tools for understanding their variations. The multiple webs of development capture the natural variability among students, and developmental range demonstrates how the variability occurs within each student" (p. 12).

The educational value of providing substantive contextual support to students has been well documented by Terry Piper and Jennifer Buckley. They provide a detailed case study that serves as an excellent example of the benefits realized when student affairs educators intentionally engage with students in meaningful advising relationships. Faced with a need to alter the negative culture that had developed in a residence hall community, residential life staff at the University of Nevada, Las Vegas (UNLV), invited students to join them in a partnership for developing community that came to be known as the Community Standards Model (CSM). By providing the kind of contextual support noted earlier in this article, UNLV staff successfully aided students in rebuilding their understanding of community.

The CSM process consists of three phases that mirror, in part, the progression of skills defined in skill theory. The first phase, establishing a foundation for community, is similar to the coordination of two skills. Students must work together to develop an agreement that details floor behavioral expectations. Phase 1 lays the groundwork for the development of the CSM by each residential community and concludes with the setting of community standards in a conversation facilitated by the floor's resident assistant. With support from professional and paraprofessional staff, students connect skills (for example, healthy communication, peer confrontation, goal setting) to form the community standard. In skill theory, this represents the coordination of individual skills.

The second phase, community problem solving, begins when residents discover that community standards alone are not enough to guide everyone's behavior. In this phase, residents voice their perspectives on an alleged incident and discuss whether a violation of the community standard has occurred. This phase readily maps onto the rectangle in skill theory; students are asked to build on their coordination of skills and make connections between the agreed-upon community standards and student behavior.

Phase 3 deals with accountability and takes place in the context of a community meeting in which a student who is alleged to have violated a community standard is called upon to discuss the problematic behavior. The purpose of this meeting is to ascertain whether the community considers the behavior to be a violation of the standards and, if so, to encourage reflection on how the behavior affected the community. This phase is similar to the skill theory level that requires connecting two or more rectangles (what the standards are, how they are to be interpreted, whether most members consider the behavior to be a violation of the standards) and the level that culminates in clusters of cubes connected by several lines (community consensus about the standards, the effects on the community as perceived by the majority, effects on the community as perceived by the alleged violator, finding ways to reconcile these differences in terms of their impact on future behaviors).

BUILDING AND REBUILDING UNDERSTANDING

SKILL THEORY provides a framework for understanding the challenges students face when making new connections or learning new ways to make meaning of old connections. Students are, or should be, continually building and rebuilding their understandings. Acknowledging this iterative process, educators have many opportunities to provide both

challenge and support for student learning. We opened this article by emphasizing the importance of helping students learn to build connections. The skills related to making connections that students should learn vary widely and include examples such as the following: relating what they already know to what they are learning and what they desire to learn; examining how the parts of a point of view support or contradict one another; examining the way they come to know in one context for its usefulness in another context; and discovering how the process of explicating underlying assumptions about prejudice directed toward one group can be applied to prejudice directed toward another group. Cocurricular as well as curricular learning contexts offer many rich opportunities for students to learn and practice skills associated with making connections such as these; developing these skills improves students' capacity to function in a complex world.

Skill theory suggests that students use cognitive frameworks (or thinking structures) to solve problems and that, concomitantly, problems inspire new learning. In collegiate contexts, there is no shortage of problems that could be used to inspire new learning; the challenge is to understand students well enough to be able to create the learning conditions that enable and encourage new learning. Skill theory has much to offer to educators who are committed to student learning and development: (1) it provides a tool for understanding the development of cognitive capacities over time; (2) it provides an explanation of why an individual student's response fluctuates across tasks and contexts (a reflection of developmental range between functional-level and optimal-level performance); (3) it provides an explanation of why students differ in the ways they are inspired by new problems and in the paths they take to acquire new learning (the multiple strands of a developmental web); (4) it emphasizes the importance of offering students not only an opportunity to learn new skills but many opportunities in different contexts and with different types of support structures, including opportunities to practice, get feedback, and then practice again to refine the skills. For these reasons, we encourage college educators, faculty and student affairs staff members alike, to consider using skill theory to understand how students develop the capacity to build and rebuild connections within what they know about the world and how they come to know it as well as their place in it.

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