

## **A LONGITUDINAL STUDY OF ACTIVE LEARNING IN FAMILY AND CONSUMER SCIENCES CLASSROOMS**

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*The dominant view of learning has become a constructivist one. An idea basic to constructivism is that learning is not something done to a learner, but it is something the learner does (Fosnot, 1989). That is, learning is related to action. Lortie (1975) noted, however, that many teachers have been limited, overtime, to observations of instruction where students are passive. To address this problem, this study focused on locating portrayals of FCS teachers who used constructivism as a guide for teaching. Phase I used the empirical/analytic mode of inquiry to identify teachers who employ teaching practices consistent with constructivism. Phase II used the interpretive mode of inquiry to uncover accounts of teachers using constructivism. Implications for future research are included.*

The dominant view of learning, for many educators, has become a constructivist one. Constructivism is a name given to a group of theories that have in common and sustain the conviction that “all meaningful learning is a form of active knowledge construction” (Derry, 1996, p. 169). Learning, according to constructivists, is associated with activity. It is not something done to a learner, but it is something the learner does (Fosnot, 1989). Learning, therefore, is connected to action; and, in a given classroom, the teacher might be the director, but the student should be the actor. Further, students’ active construction of knowledge is seen to be supported by teaching practices that flow from cognitive learning theories (Mayer, 1998). Scholars view such theories as sources, or sets, of related paradigms that share the same assumptions about memory (Ormrod, 2004).

Two learning theories that are often referenced in the contemporary cognitive literature are information processing (Mayer, 1998) and schema theory. The two constitute allied paradigms of learning theory, and the instructional implications of each have been shown to capacitate student engagement of complex thinking, which includes, among others, problem solving and higher order thinking (Resnick, 1989). Such thinking occurs most often in classrooms where students operate within boundaries that allow them active involvement in group or individual learning experiences (Gabler & Schroeder, 2003). Eisenhart and Borko (1991) wrote

A key assumption about student thinking is that learners play an active role in acquiring new knowledge. [Students] actively mediate between teachers’ actions and their own learning during classroom instruction. Learning occurs as they make sense of

instructional events by using their existing cognitive structures to interpret environmental stimuli. [Learning] also occurs as [students] modify and elaborate their knowledge structures through a process of adaptation to the [learning] environment. (p. 142)

The importance of active learning that is physical, mental (Phillips, 1995), social, or some combination of these, is widely accepted. “Constructivists strongly emphasize the importance of prior knowledge, the role of social interaction, and the value of real-world tasks in the process of constructing understanding” (Eggen & Kauchak, 2004, p. 305). Lortie (1975) pointed out, however, that many, whether they are novice or veteran classroom teachers, have been limited, overtime, to observations of learning patterns in which the mode of instruction was dominated by theories other than constructivism.

Importantly, the image of teaching and learning advocated by constructivists, is quite different from, for example, the image of behaviorism or other representations of transmission as a mode of teaching (Bransford, Brown, & Cocking, 2000; Bruning, Schraw, & Ronning, 1999). Of the many models that individuals who license to teach might carry into their classrooms, many appear to be versions of passive, rather than active, learning (Paul, 1995).

Consequently, one explanation of why some practicing Family and Consumer Sciences (FCS) teachers do not set active learning in motion in their secondary classrooms is that they cannot vividly recall and mentally visualize the teacher’s role as a catalyst in this type of classroom instruction and student learning. It appears that many teachers have a need to understand and perceive specific paradigms of constructivist theory before they can direct active learning experiences.

Lacking a “teaching sense” of the teacher’s implementation of constructivist theories, and lacking awareness of the critical connections such theories make to memory and knowledge linkages, individual FCS teachers might not recognize or seize opportunities that could optimize student learning experiences. It, therefore, does not seem enough to merely acquaint teachers with constructivism. Teachers must also have a repertoire of concrete ways to implement constructivist paradigms and postulates.

### Assumptions

Because the authors of this study accepted the suppositions that many FCS secondary teachers need concrete models and detailed descriptions of *what it means to teach so students actively learn*, suppositions related to various learning theories that are accepted as being under the constructivist umbrella were influential and consequential to the completion of our research. The following assumptions, therefore, guided our study:

1. It was assumed that becoming familiar with explicit, graphic descriptions of active learning could motivate teachers to give student populations more chances to engage in processes of problem solving, creative thinking and higher order thinking.
2. At the same time, it was assumed that furnishing secondary teachers with detailed descriptions of concrete ways to restructure student opportunities for active learning could encourage FCS teachers to develop a rationale for supporting active learning.
3. In addition, it was assumed that exposure to teacher-developed ideas consistent with constructivism could engender extensive appeal for individual teachers to execute such ideas in their respective classrooms.

## The Problem

The most direct way of confronting the dilemma posed by the perceived absence of active learning opportunities for FCS students, seemed to be to simply make available to FCS teachers graphic models of how constructivist theories have been used to successfully guide active learning in secondary FCS classrooms. The challenge, then, was to find and furnish current and future FCS teachers with many detailed patterns and options for use and application.

Educational researchers in some other disciplines have responded to the need for such accounts and published thick descriptions of teachers using constructivist theories within a variety of educational settings. Notable examples included Schifter's (1996) portrayal of an elementary mathematics lesson and Richardson's (1992) vivid account of a program for staff development.

Unfortunately, the exhaustive review of the literature completed for this study, revealed no publications that delineate in detail the ways that FCS teachers routinely implement practices that stem from schema and information processing theories. Instead, the major foci of most studies connecting complex thinking to constructivist theories have been objective or criterion-referenced assessments of student outcomes, such as achievement scores. Rather than student assessments and evaluations, efforts to solve this particular problem might have more potential if there were a major focus on teacher practices.

## The Purpose

Having recognized the necessity for and absence of distinct and precisely detailed accounts of implementation of active learning for FCS teachers, this study was undertaken in two parts. The first used quantitative methodology and the empirical/analytic mode of inquiry. The second phase used qualitative methods and the interpretive mode of inquiry. Identification of teachers who employed the instructional implications of constructivism was the intent of Phase I. Uncovering and collecting detailed accounts of teachers using cognitive learning theories in their respective secondary classrooms was the objective of Phase II.

## The Variables

To facilitate measurement of the principles identified in constructivist theories, basic premises of information processing and schema theory were operationally defined for this study. The definitions follow:

1. Elaboration: embellishing instructor examples or student examples for the purpose of adding detail to a concept
2. Experiential learning: situating learning activities to let students have real-world, on-the-job or hands-on laboratory or classroom experiences
3. Modeling: showing by doing, providing students with a visual representation
4. Organization: constructing or showing or using charts, matrices, tables, graphs, figures, or hierarchies
5. Orienting Stimuli: capturing or focusing attention of students in emphatic mental or emotional or physical ways that enhance understanding for both audio and visual learners.
6. Prior Knowledge: focusing on or reviewing old information to provide connecting points to new information and making new information more meaningful.

7. Rehearsal/Repetition: allowing students to hear facts a number of times, within multiple modes of representation, with subtlety and different nuances, or within different contexts.

It is important to note that modeling and experiential learning, listed above as two of the operational definitions for information processing, are also accounted for and considered to be important in other learning theories. For example, the two are also delineated in, respectively, theories of behaviorism, social cognitive theory (Bandura, 1997; Pintrich & Schunk, 2002), and apprenticeship (Rogoff, 1990).

## **Phase I**

### Methodology

The population. The population for Phase I was limited to FCS teachers employed in Utah's five largest school districts. These are located along the heavily populated Wasatch Front Region of the state. The entire population of FCS teachers in the five districts was comprised of female teachers. There were, and now are, male FCS teachers in Utah; but, at the time of the study, it happened that all of the FCS teachers in the districts constituting the population were women. The population was also limited to include only those FCS teachers who had taught more than three school years. Further, it was restricted to those who had also served as a cooperating teacher, for one or more of the teacher education programs offered by any of the four major universities in Utah.

The sample. From the population, 15 junior high and 15 high school teachers were randomly selected. The sample was stratified by district. Thirty teachers were selected and became the source of the data for Phase I of the study.

Hypotheses. Two hypotheses were generated, as follows: (1) It was anticipated and hypothesized that, among the 15 junior high and 15 high school teachers chosen to be in the sample, there would emerge teachers who embraced and practiced constructivist notion(s) as shown by the use of schema and information processing suppositions. (2) Further, it was hypothesized that, within the sample, there would be teachers who would provide prototypes that could be both patterns and catalysts, encouraging and helping colleagues implement, in their secondary classrooms, the variable identified in the operational definitions for this study.

Data collection. In order to identify FCS secondary teachers who were familiar with and used schema and/or information processing paradigms, a survey was hand-delivered to the teachers in the sample. Each teacher was asked to complete the written questionnaire by a specified date. On that date, the principle researcher collected the surveys.

It should be noted that at no time preceding Phase I of the study did the research team mention constructivism as a paradigm to guide learning in the classrooms of any of the teachers in the population or the sample. Moreover, neither of the cognitive learning theories that were anticipated as a focus of a final study was discussed by the participants or the FCS educators who were the researchers that collected and analyzed the data.

The data collection process was carefully and purposely engineered to ensure a high rate of return. Initial delivery was pre-arranged by a telephone call and a second telephone call reminded teachers, who had received the survey, of the pending visit of the principal researcher to collect the questionnaires. An unprecedented 100% of the surveys were returned.

Data analysis. Analysis of each individual teacher's survey provided a frequency distribution reflecting the presence and the incidence of schema theory and information processing, as measured by the study's operational definitions. Content analysis was utilized to code and chart

answers to the survey's open-ended questions. The patterns that emerged from the content analysis were folded into dominant patterns and reported in aggregate. Finally, completion of data analysis yielded a numerical ranking of the teachers. The ranking reflected the self-report, by each of the sample teachers, of individual use of variables related to constructivist theories. Results showed three junior high school teachers and three high school teacher to be in the highest places on each of the respective frequency distributions. Each of the six teachers had identified many situations in which their objectives and learning activities reflected teaching practices that matched the definitions listed by the research team.

## **Phase II**

### Research Question

Since the intent of Phase II was to identify, chronicle, present, and publish characterizations of models related to constructivist paradigms, a revised research question re-focused the study. The research team asked, "In selected secondary FCS classrooms, can concrete accounts be observed, documented and described to showcase implementation of active learning?"

### The Context

Phase II was a naturalistic study conducted in the secondary classrooms in the Utah Public School System. Two junior high school and one high school teacher, together with their students, were observed while regular, daily schoolwork was ongoing.

### Population and Sample

The six teachers, who ranked highest on the frequency distribution of data in Phase I, comprised a group from which three were selected to provide data for Phase II. Each of the three teachers made reference to building new or different student learning experiences on pre-assessments to determine previous knowledge of a topic. Although the informants did not refer to information processing or schema theory by name, the practice of pre-assessing before implementing a planned unit indicated use of prior knowledge to enable student learning. The three teachers who verbalized use of the pre-assessments were, therefore, selected to be the data sources for case studies in the field study investigations that were planned for Phase II. Each of the three teachers was asked to allow participant observations in her classroom, in order to develop three case studies. All three teachers agreed to participate.

### Portraits of Key Players

Researcher preference and prejudice is a concern in interpretive research. Portraits of the researchers, the teachers and the students help to establish validity in such research. The following portrayals admit and allow insight into participant research bias.

Portrayal of the researchers. The authors of this study had been secondary teachers. In aggregate, all had been cooperating teachers for Departments of Education in the major universities in Utah. Each had taught or was teaching FCS courses in family-related disciplines at the university level. Two had been department chair persons at the secondary level. Two were teacher educators having a combined total of more than three decades of teaching experience. All were active and had been on the boards of major professional organizations in the state; each had served in elected and appointed positions in national professional organizations.

Portrayals of the secondary teachers. Historically and traditionally, family and consumer sciences is a discipline divided into subject-matter specialty areas. The case study teachers had been assigned to teach in different FCS subject-matter-specialty areas, according to the needs of particular schools. One taught Apparel and Textiles, two taught Fashion Strategies, two taught Family Studies, one taught Child Development and Occupational Child Care, all three taught Food Science and Nutrition. Each was active in extra-curricular activities, advising student groups related to the FCS discipline and to student government. Each had access to and used the state-authorized textbooks appropriate to the courses assigned them. Each also used other, required resources, such as curriculum guides provided by the Utah State Office of Education. The high school teacher and one junior high school teacher had Master of Science degrees. The other junior high school teacher was taking graduate classes.

The secondary teachers had been active on various professional committees and in different elected or appointed professional offices on their own faculty or in the state affiliates of national professional organizations. Each was a member of one or more national honors organization. Each was well liked by students and professional colleagues, and each was considered by her chief administrator, students, parents, and colleagues to be an outstanding teacher. In addition, each had been honored by the state affiliate of either the American Association of Family and Consumer Sciences (AAFCS) or the Association of Career and Technical Education (ACTE) as the Utah Teacher of the Year.

Portrayal of the students. All students who were observed in the 90-minute case study classes were in the ninth grade. The observed classes were approximately the same size, having 35-45 students enrolled in each one. Students were a like mixture of adolescent boys and girls who lived in the same general geographic area and came from the socioeconomic strata encompassed within the school district boundary. All the students were given parental permission, in writing, to have participated in the observations that were required to complete Phase II.

## Methodology

Data collection. Each teacher was asked to allow observations in a preparation of her choice as long as she repeated the preparation at least once. The principle researcher then chose one of the class periods in which one of the sections of the repeated course was taught. Once each course had been identified, the respective teachers provided detailed unit lesson plans, in advance of teaching them, to the research team.

In order to collect the data, the observer attended every session of the chosen class. A video camera was also put in place and left in place for every session. The students and the teacher were given the time needed to adjust to the presence of the researcher; she and the camera became part of the regular classroom routine. The camera operated in the classroom throughout every class period, and the observer wrote detailed notes throughout every class period. This continued for the duration of the two semesters allowed for data collection. The videotapes let the research team and the teachers revisit the classrooms. The written notes contained detailed descriptions of the ongoing classroom enterprise. In addition, each teacher kept a Teacher Notebook and Log. At the end of each school day, she recorded any facts and feelings she felt were important, as she reflected upon her experiences in the Case Study Course.

Data analysis. Data were transcribed and interpreted at the end of each day. Weekly, the secondary teacher and the observer dialogued about findings in order to come to consensus about meaning and understanding. Emerging patterns helped to establish a data trail. As it built,

observations were ongoing. Special attention was given to direct quotes of teachers and students. Triangulation resulted from consultation between the observer, the teacher in the classroom and students in the classroom in order to establish a consensus of meaning. Triangulation also built between the teacher being observed, the observer, and another member of the research team. On occasion, triangulation involved Dr. Wayne Shute, a Brigham Young University Educator, who was a specialist in schema theory and active teaching and who was not one of the authors of this paper. Finally, following a 12 week summer break, the researchers revisited the findings of the data analyses. By distancing ourselves and then returning to contemplate the findings, we could revisit the interpretations. Consequently, some emerging patterns were revised and other patterns were combined. Dominant themes were identified.

Patterns and dominant themes. Early in the study, patterns emerged that showed the case study teachers used teaching methods and learning activities that corresponded to the variables in the study. In dialogues and discussions, the teachers communicated and elaborated upon their use of constructivist theory and its connections to active student learning. There were verbal, written and tape recorded situations in which there was evidence that the teachers planned to teach and taught in ways that used constructivist theory. It was also apparent that the three Case Study Teachers used methods that supported active learning.

It also became apparent, however, that “schema” and “information processing” as paradigms or theories *were not really part of the working vocabulary of the three teachers*. In fact, the teachers said they did not “think” about curriculum or lesson planning in terms of using particular theories, assumptions or paradigms. In the recorded dialogues, it was the university professor who mentioned considering, reflecting upon, thinking about or being motivated to implement educational psychology-related paradigms or suppositions in teacher plans for student learning.

When asked specifically about this, one of the teachers in the trio, who had completed a graduate degree in education, recalled learning about the information processing in an educational psychology graduate course. The teacher explained that she remembered having read explanations of information processing in a text and had also listened to explanations in class lectures. She, however, had not been directed or otherwise motivated to seek out or implement examples of the theory.

The teachers were more cognizant of the use of a variety of methods to accommodate individual student learning styles than they were of using active learning models. All of the teachers cited the importance they attached to active learning to be grounded in their pre-service FCS methods courses, which the three overwhelmingly identified as their most valuable resource. A second major source was State Office of Education teacher professional development workshops and curriculum guides, some of which were required to be used because of competency-based testing. A third common source was the example of cooperating teachers who worked with them in teaching practicum experiences.

Importantly, the necessity of using hands-on experiences in courses with optional or required hands-on laboratory experiences sometimes “jump-started” the use of active student learning. Careful analysis of both the videotapes and participant observations showed that the most prolific evidence of active learning was linked to courses that required laboratory facilities and experiences.

One of the Case Study Teachers asked and then answered a pointed question: “If you are in a laboratory situation, how could you avoid active learning? It would be impossible.”

A second Case Study Teacher, who integrated Family, Career and Community Leaders of America (FCCLA) into her classroom, said

I do use active learning as it was defined for the study. I use elaboration and repetition and real-world examples to add detail to concepts. . . . In [other] courses, however, I must demonstrate skills . . . In food science and nutrition, the hardest part of teaching is the use of charts, tables and graphs. It seems like I focus continually on old information to help students internalize new learning. I repeat and repeat in the same and in different ways.

The same teacher added, “I do not usually stop to think of information processing as a model advocated by scholars, and I hardly ever think about education theories when I plan what I am going to teach in my classes tomorrow.”

Follow-up interviews showed frequent, rather than optimal use, by these excellent teachers, of constructivist theories. The reason seemed to be that, they did not link the education jargon with any concrete, visual models, from their own personal experiences as students or student teachers. They had practically no concrete examples, and did not remember ever having been directed to observe educational psychology or other university education specialists who talked about and then provided models for applying the prescribed processes. Therefore, constructivist theories did not become a basis for instructional procedures, as such, for either learning or teaching.

The above findings were supportive of the literature review for this study, which indicated that, during the years when the teachers were, themselves, attending elementary, secondary, college, and university education, the teachers, as students, experienced what Lortie (1975) termed an “apprenticeship of observation.” Moreover, in FCS courses on teaching methods, they were introduced to active learning methods, but not to constructivist vocabulary. Further, lacking the vocabulary, they implemented what worked for others or what the state curricula required without articulating any theory.

Perhaps most important of all, was the underscoring of the use of laboratory models and laboratories in the FCS secondary classroom. Ancillary to that was the practice of group work and demonstrations as important methods of teaching FCS subject matter in the specialty areas taught by the case study teachers.

Resources included state-developed and authorized curriculum guides that suggested sequence, title, objectives, concepts, learning experiences, and assessments for elective, one-semester or two-semester courses. The guides were published by the State Office of Education FCS Secondary Supervisor and distributed for use throughout the state as support for required, sequential, and articulated FCS family-related courses.

All three case study teachers, however, cited consulting and using the above resources in defining behavioral objectives and designing learning activities. The three teachers did not use or associate names related to constructivist theories with the processes, even though, when asked to do so, they could easily identify and connect the learning experiences to the list of variables used in Phase I.

For one thing, the state curriculum guides and teaching routines retained from FCS university methods courses employed, among others, active learning experiences. The teachers simply and confidently relied upon state curriculum guides along with examples of “what had worked for professional colleagues.”

## Conclusion

We began by noting that learning is related to action, an important idea for constructivists. Nevertheless, activity does not ensure quality. Eggen and Kauchak (2004) suggested that the group processes and products that accompany social interaction, for example, do not necessarily equate with individual learning. Assessment, establishing clear objectives and instructional alignment are critical for applications of constructivism. When compared with applications of behaviorism and other forms of transmission, practices that flow from constructivist theories increase the complexity of the teacher's role. Eggen and Kauchak (2004) stated

Teachers must listen to students as they describe their understanding and, when necessary, intervene to help students construct complete and valid schemas. The ability to monitor students' thinking, assist in the knowledge construction process, and intervene soon enough to prevent misconceptions, but not so soon that students' responsibility for learning is diminished, is very sophisticated and demanding instruction. (p. 305)

The focus of our future research efforts, therefore, will be to depict vivid accounts of these kinds of practices as implemented in a vast array of FCS classrooms. We encourage other FCS professionals to collect and write such portrayals of constructivist learning environments so that a larger number are available for contemplation on what it means to teach and learn.

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