A Structured Model for Reflective Adult Learning Among University Faculty

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The critical need for professional development of faculty is practical and strategic. It's important to consider how professors, who are themselves adult learners, develop within the context of higher education. One path may be the application of reflection on practice as an adult learning approach for faculty development. The study was developed to consider reflection on experience, and how reflection stimulates the learning of adults in their role as faculty. Reflection is seen as a formal, cognitive process, incorporating information from past experiences to enhance perceptions of satisfaction or engender a decision to change behavior in the future.

INTRODUCTION

Higher education in America is undergoing profound cultural and social transformation. Paramount to this transformation is a reconstitution of the role of the faculty member. The implications for individual faculty members, and the institutions they serve, are significant. The critical need for professional development of faculty is practical and strategic. In this context, it is important that we consider how college professors, who are themselves adult learners, grow and develop within the context and culture of higher education. One path may be the application of reflection on practice as a personal adult learning approach for faculty development.

According to Knowles, Holton and Swanson (2015), the central question of how adults learn has occupied the attention of scholars and practitioners since the founding of adult education as a professional field. Decades later, there is still no single answer, no one theory or model of adult learning that explains all that is known about adult learners, the various contexts where learning takes place, and the process of learning itself. Knowles et al. (2015) argue that what we do is a mosaic of theories, models, sets of principles, and explanations that, combined, compose the knowledge base of adult learning. This review of the literature provides a foundational viewpoint concerning adult learning and offers an improved understanding of possible connections between some of the early work in adult learning to the current model, which can facilitate the learning of college faculty, being presented within this paper.

FOUNDATIONAL KNOWLEDGE ON ADULT LEARNING FROM EXPERIENCE

From the 1920s through the 1940s—the earliest years of the emergent Adult Education literature, a clear emphasis on learning from experience is at the foreground of descriptions of adult learning by Lindeman (1926), Thorndike (1928), Bryson (1940s and 1950s), and numerous others. Later, the likes of Knowles (1950s and later), Friere (1970's), Mezirow (1980s and later), and Kolb (1980s) would describe

this learning from experience in terms such as problem-posing, personal transformation, learning from prior experiences as a primary method, and *praxis*.

Malcolm Knowles (1950) contended an adult's life experiences play an important role—perhaps the most important role—in adult learning. Knowles' work revolved around the concept of self; the adult's self-concept as a mature, responsible decision-maker in which learning is problem-based and often collaborative. In the 1960's, Knowles borrowed a new label to understand adult learners, *andragogy.* Self-directed learning is oriented towards adults who have a propensity to be active learners and who value authentic, experiential learning (Knowles et al, 2015, p. 38-48).

The significance of self-directed learning from experience was considered by Tough (1978, p. 40) for adults who were learning independently of an instructor. Tough found that 90% of the adult sample had engaged in at least one learning project and 70% of all projects were planned by the learners themselves. Tough (1978) continued to describe the presence of self-directed learning, where the adult crafts his own plans to learn, which may include selecting, managing and assessing his own learning activity. According to Tough, adult learners take the initiative and the responsibility for what occurs and initiate personal challenge activities.

Knowles' (1975) summarized his conception of adult learning as, "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (p. 18).

Kolb's experiential learning cycle, like other foundational authors, emphasized concrete experience(s), observations and reflections, formation of abstract concepts and generalizations and testing implications of concepts in new situations (Kolb & Fry, 1975).

Finally, Jarvis (1980s and 1990s) described a model of learning whereby the whole person, body and mind, experiences social situations, the content of which is then transformed cognitively, emotively or practically (or a combination of) and integrated into the individual person's biography resulting in a continually changing person (2010, p. 81).

FOUNDATIONAL KNOWLEDGE ON REFLECTION

Since the concept of *reflection* was first articulated by Dewey in 1933, it has gained traction in multiple disciplines and professional fields. For almost a century, reflection has been the subject of inquiry, development and interpretation by many influential authors, notably Schön, who coined the term *reflective practice* (Schon, 1983, 1987). As evidence of its use in a diversity of contexts, reflection has assumed a variety of definitions. Although an operationalized definition is needed to help guide further research and applications for adult learners, the numerous and varied definitions that exist within the literature can serve the purpose of strengthening one's understanding of reflection.

Dewey (1933) conceived of reflection as a distinct and specific form of thinking, rooted in the scientific method. Dewey further argued that reflection is "active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends" (p. 78). Donald Schön (1983, 1987) advancing Dewey, defined reflective practice as the practice by which professionals become aware of their implicit knowledge and learn from their experiences. Schön spoke about reflection in action, behavior as it happens, and reflection on action, reflecting after the event, to review, analyze, and evaluate the situation.

In the early 1990's, reflection, again, gained attention. Brookfield (1991, p. 177) believed it was a process comprised of three interrelated phases. The first phase was to identify assumptions that underlay thoughts and actions, the second phase scrutinized the accuracy and validity of these in terms of how they connected to, or were discrepant with, experience of reality, and finally, to reconstitute these assumptions to make them more inclusive and integrative.

Mezirow's work on reflection is also frequently referenced in the literature. He argued reflection is "the process of critically assessing the content, process, or premise(s) of efforts to interpret and give meaning to an experience." "Premise reflection," according to Mezirow, "involves becoming aware of

why we perceive, think, feel or act as we do and of the reasons for and consequences of possible habits" (Mezirow, 1991, p.12).

More recently, Sandars (2009) viewed reflection as "a metacognitive process that occurs before, during and after situations with the purpose of developing greater understanding of both the self and the situation so that future encounters with the situation are informed from previous encounters" (p. 685). Wald (2015) proposed additions to Sandars' definition including the presence of feelings, and a sense of awareness of self and others as part of this process. Meryl Thompson (2010) suggested that reflection and reflexive practice are a close examination of one's own thoughts and behaviors, leading to learning from experience and an experimental disposition toward outgoing activity. Wlodarsky and Walters (2015) also suggested a working definition of reflection:

> Reflection is a multifaceted construct comprised from different types of events—authentic or reproduced—which are experienced both through and outside of the individual and his or her socio-cultural history. It is further understood that the cognitive process occurs on a continuum of subjective to objective based upon the tools incorporated in cognition (p. 65).

THE STUDY

This prior discussion and literature provides a summary of conceptions and models in which adult learning can be understood in the context of learning from experience. Equally important to adult learning is the concept of learning from reflection. The current study was developed to consider reflection on experience in professional contexts, and how reflection stimulates the learning and development of adults in their role as college faculty.

Research Questions

The research questions for the study included: what does the reflective *process* look like and how might this practice relate to professional growth and development and changes in professional practices? And, are there similarities among the individual respondents with respect to how they described their individual reflective processes?

Population and Data

A voluntary sample was recruited comprised of 25 professors from Colleges of Education, Arts and Sciences, Business, and Nursing and Health Sciences, at a private, liberal arts university in the Midwest. Located in Ohio, this institution of higher education is guided by a Christian heritage, and espouses core values such as individuality, character development, and excellence in teaching. The participants varied, ranging from tenure-track to tenured faculty who teach undergraduate and graduate courses. These colleges implement a reflection-based model of annual faculty review and professional development for tenure-track as well as tenured faculty. The faculty who volunteered comprised approximately 14% of the total college faculty at the time of the study. All volunteers signed informed consent statements that explained the study and the intended use of their responses.

The sample included individuals who selected to participate at an anonymous level—completing the survey only. Respondents defined reflection and discussed cognitive processes that facilitated reflection on their own professional development. The specific survey item read as follows:

> Write out a brief definition of reflection and describe how this practice might relate to your professional development as a faculty member. As part of your definition, describe the tools you use to facilitate your reflection(s). Examples of tools include but are not limited to: portfolios, journal writing, student comments, peer feedback, course artifacts, discussions, inquiry questions, and video/audio-taping. Please indicate any other tools you have used to facilitate your reflection(s).

Those seven participants who chose to participate by submitting reflective narrative documents did so confidentially, as all identifiable information was excluded from reporting. Sampling bias was controlled

in part through the use of archival documents (narratives) which were developed prior to the study announcement. Data and project reports were edited to ensure confidentiality of participants.

Data Analysis

A constant comparative procedure, which is a qualitative coding strategy, was used to examine the processes described in the responses to the item above. Initial themes and categories among the narrative responses were established as a first step in enhancing the credibility of the project. The themes which emerged have been observed in related literature as cited throughout this paper, providing additional confirmatory support for reliability and credibility of the findings.

An analytic concept mapping procedure described by Novak (1998) and Novak and Gowen (1984) was used to organize the narrative data. This procedure allowed the researcher to organize and to label participant responses. The coding strategy, following Novak (1998), treated words and phrases (grammatical units) as discrete conceptual units of equal weight. Based on a logical-rational use of vocabulary definitions, these conceptual units were then clustered to establish themes. These themes were then cross-walked to the literature cited previously to establish the reasonableness of the themes and to control or constrain researcher bias. The researcher employed a colleague with expertise in data coding to assist in the analysis process. The researcher/author and this colleague/coder coded the first participant's survey responses together to standardize the coding process. Following agreement on the process to be used, two additional participant responses were coded, and compared to monitor agreement on the process and consistency of coding. Finally, the remaining responses were coded, creating a total of 23 concept maps. It should be noted two faculty responses were too brief for meaningful analysis and were excluded from analysis. Analyses, as well as findings, were constructed and edited to protect the individual privacy of the participants.

Findings

Nineteen of the 23 concept maps which were developed from participant responses have strong similarities. This implies that a preponderance of participants use the same reflective process to consider their own professional activities. A meta-map depicts the typical path followed by the respondents (Figure 1 below) and is consistent with the 19 maps developed around the respondents' narratives. For four of the 23 respondents, there was not a clear indication that a behavior change (new event) was implemented. Examples of individual maps from the typical event path are depicted below as Figures 2-5.

FIGURE 1
REVISED EVENT PATH FOR PROFESSIONAL REFLECTION

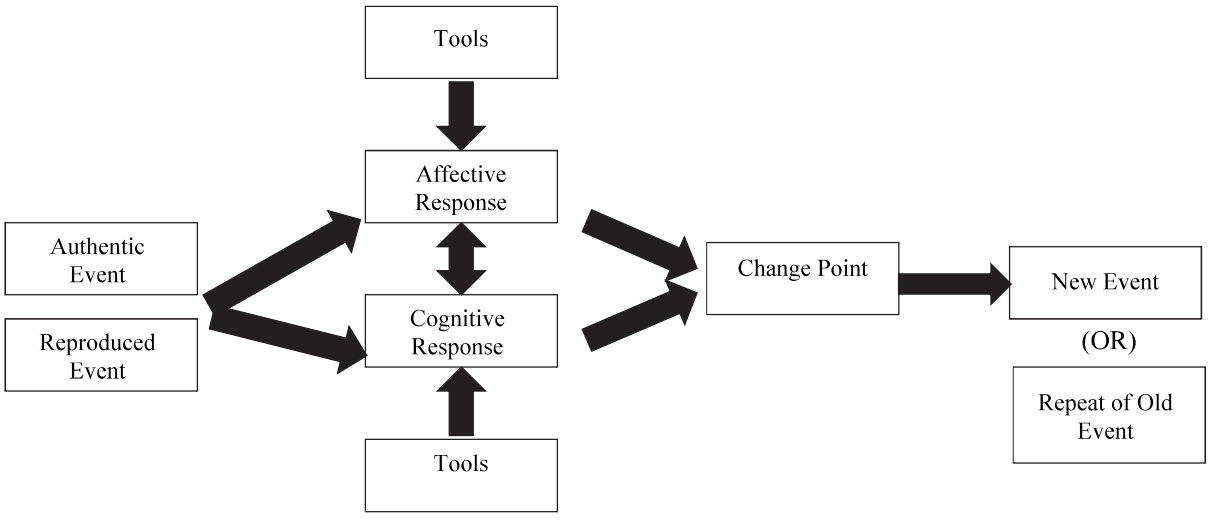


FIGURE 2
EXAMPLE MAP FROM PARTICIPANT 2
(AUTHENTIC EVENT, COGNITIVE COMPONENT, REPETITION OF OLD EVENT)

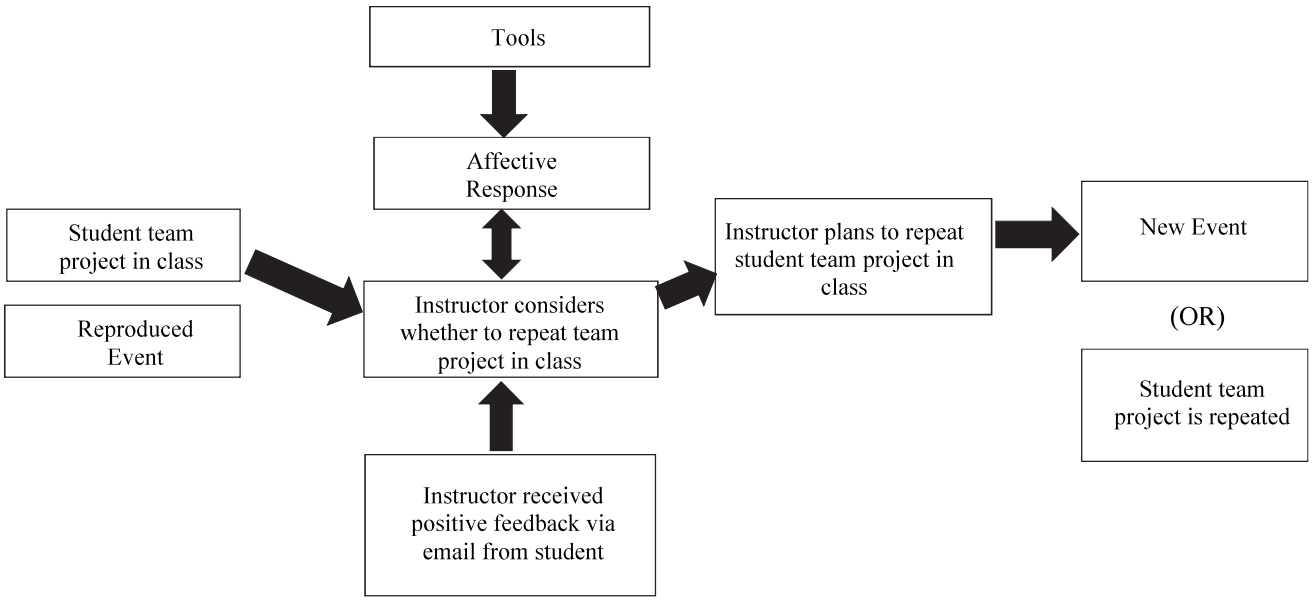


FIGURE 3
EXAMPLE MAP FROM PARTICIPANT 5
(AUTHENTIC EVENT, AFFECTIVE COMPONENT, NEW EVENT)

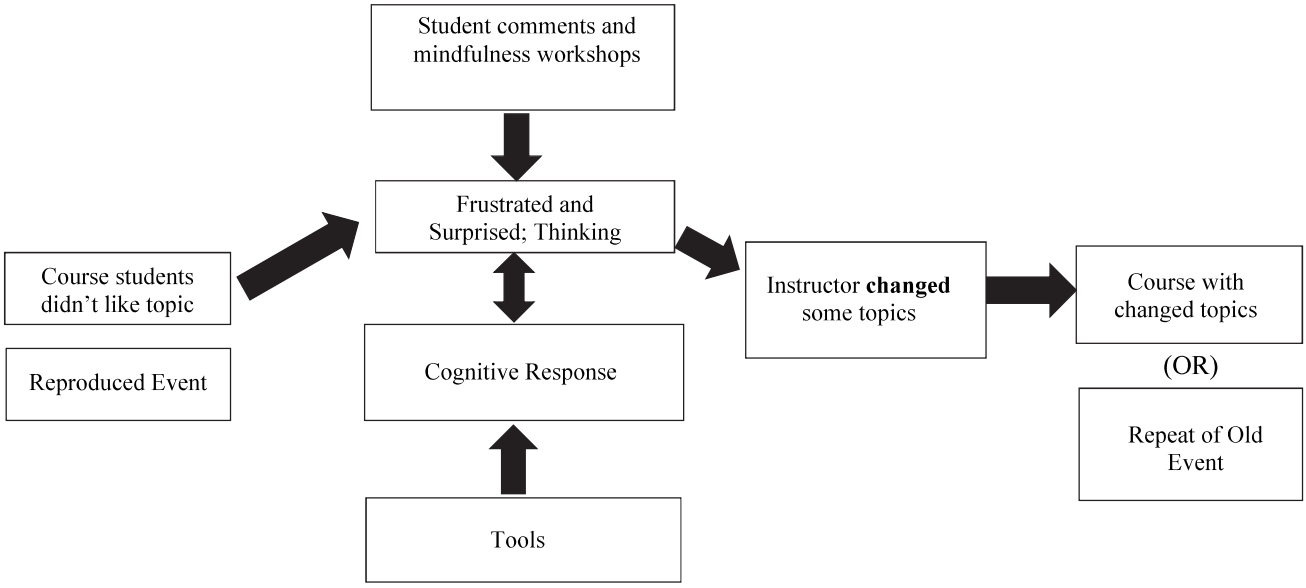


FIGURE 4
EXAMPLE MAP FROM PARTICIPANT 6
(REPRODUCED EVENT, COGNITIVE COMPONENT, NEW EVENT)

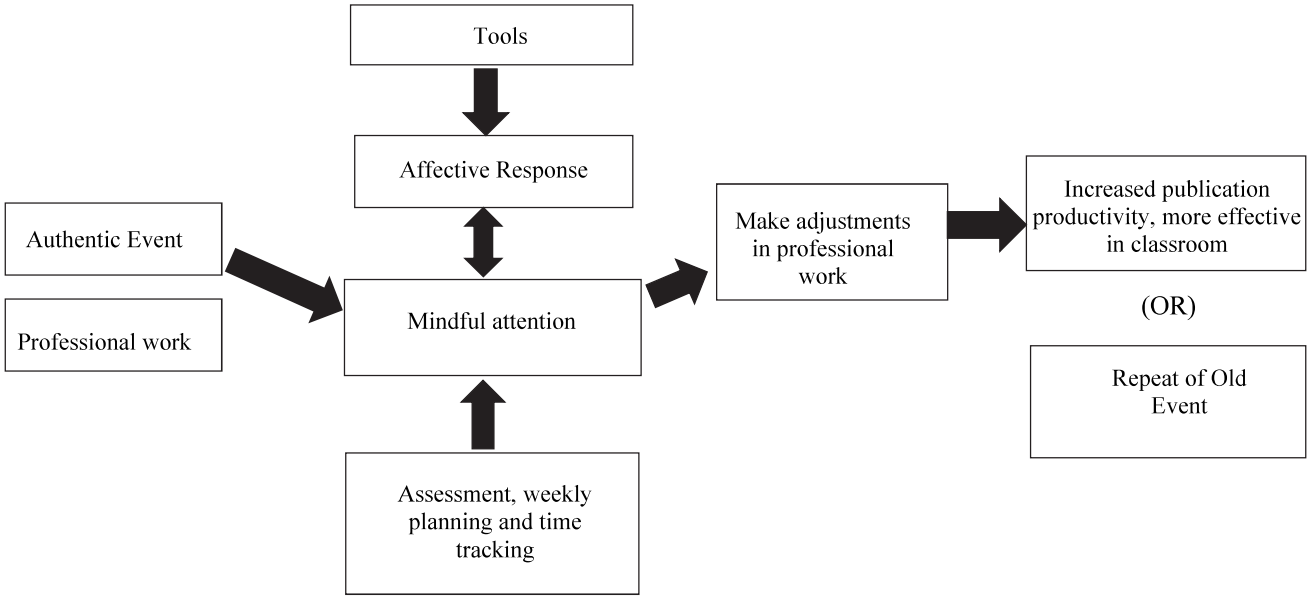
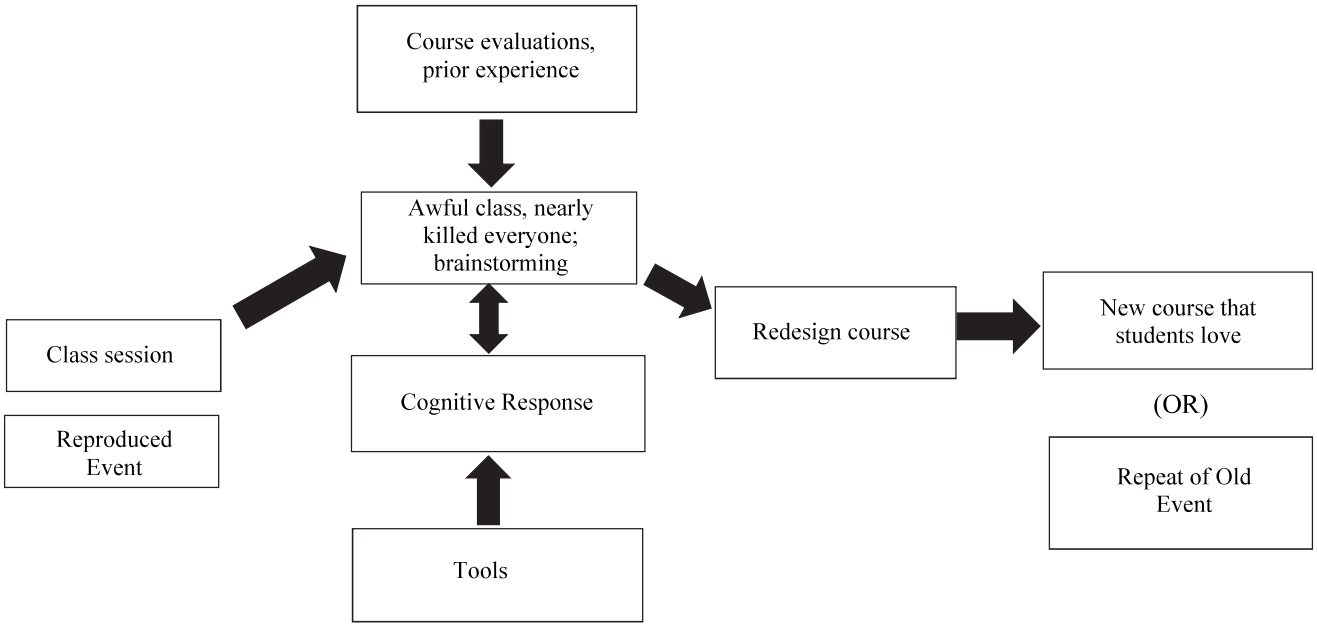


FIGURE 5
EXAMPLE MAP FROM PARTICIPANT 8
(AUTHENTIC EVENT, AFFECTIVE COMPONENT, NEW EVENT)



The typical path followed by the participants indicated a precipitating *Event*, Authentic or Reproduced (Wlodarsky & Walters, 2015), followed by an intentional period of *Cognitive or Affective* processing of information. The *Cognitive or Affective* component served as the point in which some problem was formulated. The information processed during this period was derived from *Tools,* which is a form of data collection by the respondents. Common types of tools used by these respondents varied by individual and will be discussed in detail within the discussion below. For 19 of the respondents with strong similarities mentioned above, these phenomena are followed by a *Change Point*, where behavior changes based on a cognitive decision. The *New Event* terminology is limited to the occurrence of an actual change in behavior. For four of the respondents, there was not a clear indication that a new event emerged, rather a decision was reached to affirm prior practice due to satisfaction in some way.

The discussion below describes the narrative provided by the respondents associated with each of the elements on the *Event Path,* with implications from the broader literature review. Specific narratives are included in the sections that describe each of the components of the *Event Path.* This model is a simplified approach for analyzing the professional reflections and decision-making of college faculty members, and the terminology supplied by the respondents in the survey narrative can be viewed as indicators of individual cognitive, epistemological, developmental, and reflective levels or stages. Further, this model provides an organizing framework, which may be useful for self-directed learning and for planning professional development for faculty members. Finally, the potential for impact on adult learning or students' experience of higher education clearly emerges in the data.

DISCUSSION

Authentic or Reproduced Event Terminology

The importance of the *event* as the phenomenological trigger for reflection leading to change in professional practice cannot be overstated. This is the conceptual bedrock that allows a discussion of learning in or through practice, as opposed to learning about practice in a depersonalized manner. This type of thought was termed *technical rationality* by Schön (1983, 1987), whose now seminal works are the basis for much of contemporary thought on reflection. For Schön, the professional must expand upon technical understandings of the field of practice by an elaboration of experience—through reflection-on, reflection-in and reflection-for authentic practice experiences. Reflection-on-action occurs after the action has been completed and is a look back on experience to better understand it. Reflection-in-action occurs during unique situations requiring problem solving in the midst of the experience. Reflection-for-action occurs when the individual begins to anticipate situations before being faced with them and/or begins to plan for the future to improve the present situation/outcome.

This notion of the event, or Campoy's (2000) *opportunity*, is sustained and greatly expanded by King and Kitchner (2004) in their earliest (Stages 1 and 2) levels of reflective practice. For professionals at these levels, there is "an assumption that knowledge is gained through direct personal *observations*" (p.7) (i.e., direct personal experience). This language is consistent with Campoy (2000) and Schön (1987) and is also consistent with the identification of the practice event. Thus, the label event is conceptually identical to Campoy's opportunity, King and Kitchner's observation and Schön's *professional action*. The observation of a similar underlying phenomenon for each of these terms across each of these lines of research enhances the credibility of these earlier studies as well as this current research.

For these participants, their process of professional development as college faculty began with an incident—an event—of practice. This may have been a class session or a set of classes over a semester period. One participant specifically mentioned, "Looking back on lessons, presentations, and other pieces of work as a stimulus for reflection." Yet another stated, "The act of processing what happened on a particular day with a particular lesson; what made it an effective or ineffective lesson." The event may have been student work, which became, for the professor, secondary evidence of one's own professional performance. One other participant responded, "Examining and reexamining my instruction, the projects I ask students to do, and the problems I ask them to solve." The event may have been a set of reviewer comments on a manuscript submitted for publication. A participant commented on an event, "reviewer

comments on articles and paper proposals, reading research and attending conferences." Nevertheless, for these professors, there was clearly a precipitating experience linked to a subsequent cognitive processing. This observation supports Schön's (1987) localization of the reflective act in practice itself, and not in technical rationality or knowledge-about.

This observation—that reflection must follow a practice event—suggests that one doesn't learn *how or about* practice, but *through and in* practice, a finding well-grounded in research on other professional groups but not on college faculty until this study. This fact immediately focuses a harsh light on many professional development activities, which are divorced from active engagement with practice events for college faculty.

Nevertheless, there does seem to be a cognitive ability to reflect on simulations (or reproduced events) when these closely simulate professional experiences or scenarios that are familiar to the individual. There might include watching video of teaching sessions with another teacher and reflecting on one's own potential actions had the individual actually been teaching. The potential for these reproduced events is not a major focus of this paper however, so it not discussed at length.

Tools Terminology

"Either you can have your learners' attention *or* they can be making meaning, but never both at the same time. Meaning is generated internally, and it takes time. External input (more content) conflicts with the processing of prior content and thoughtful reflection" (Jensen, 2005, pp. 36-37). This conclusion by Jensen has been elaborated and developed through neurological studies of the hemispheres of the human brain (Taylor & Marienau, 2016; McGilchrist, 2010). These studies and others describe the response to sensory input in the left and right hemispheres of the brain as being related and dependent, but clearly different in purpose and timeline of sensory data processing and meaning-making. In gross terms, the left brain processes new data within the neural pathways established by prior experiences and learning. The right brain seeks a broader, more Gestaltian (Wertheimer & Reizler, 1965) view of past experience and seeks, through associative processing and structural mapping, to both create meaning and to seek novel or innovative solutions to new experiences (Taylor & Marienau, 2016, pp. 69-81). And while these hemispheres are tightly interactive through shared electrical transmissions in the corpus callosum, the brain is evolved to prioritize left brain analysis, to foreground "fight or fight" responses—leaving the right brain functions at a relative disadvantage (McGilchrist, 2010).

The implications of this neurological understanding on human learning from new experiences, prior understandings expressed as elaborated neural pathways, and our ability to hold new experience in working memory to reorient or redirect our understandings and behaviors in the future, all relate to the present discussion of reflection as a learning path for professional development. As Jensen noted in the quote above, we cannot both directly process (record) new sensory experience data and make meaning from those data easily at the same time. This is the benefit of reflective learning. And further, this suggests that the use of cognitive memory aids to enhance right brain associations, critical reflection, and meaning-making are a valuable element in adult learning from reflection on experience.

In the participant maps (figures 2-5 above), the author has termed these cognitive memory aids *tools*, as they do in fact aid the work of right hemisphere cognitive processing by objectifying the available sensory and experience data in forms that can be processed more deliberatively and slowly. Creating the time (Jensen, 2005) that is necessary for reflective learning. In this current study, the participants described numerous such tools:

- Peer evaluations
- Student evaluations/course evaluations
- Student performance records
- Journals
- Mid-semester student evaluations
- End of semester student evaluations
- Focus groups

- Peer evaluation
- Faculty discourse
- AURWC (faculty writing community)
- Friends
- Diary/notebook
- Friday letters
- Daily, weekly reports
- Student feedback
- Peer feedback
- Comparative review of produced results over time
- Gibbs reflective cycle
- Demming cycle (Plan, do, check, act)
- Strategic management process
- Student comments
- Book: *Advice for New Faculty*
- Participate in AURWC and in a mindfulness program
- Portfolios of student performance/rubric

In each of these cases, the specific tool, or cognitive memory aid, is an objective source of information about an experience the participant had—a course, a response to a piece of scholarly writing, output from various peer, student, or management reviews, and other experiences in the professional setting. It should be noted: these cognitive memory aids are distinct from cognition—discussed next in this manuscript—as these are external to the adult brain, where cognition is an embedded biochemical and sensory processing function of the brain.

Cognitive or Affective Terminology

Webster's Dictionary defines cognition as relating to, being, or involving conscious intellectual activity. Using Oxford English Dictionary's definition of cognition, Boucouvalas and Lawrence discussed cognition as "the action or faculty of knowing, knowledge, consciousness." (as cited in Kasworm, Rose & Ross-Gordon, 2010, p. 36). Those processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used characterizes cognition for Neisser (1967). More recently, Hedberg (2017) describes the notion of cognition as a "deliberatively introspective process," (p. 521). Terms such as "ponder, mull over, examine, reexamine, think about, thoughtful consideration, review, mindful attention and brainstorm" were used by the participants to describe this circle of thought known as cognition. These terms signify intellectual activity, actions of knowing and deliberate introspective processes.

It is the intentional period of *cognitive* processing which serves as the point in which a problem is formulated. The author argues it is this construct, cognition, that goes beyond just thinking and is the energizing element for growth and change among college faculty and the institutions in which they serve. The data indicates that reflection for the participants involves an internal, cognitive process. The participants engaged in a mental process whereby awareness surfaced; a sense of knowing emerged or knowledge was created.

In short, they had to "think about" their experiences for some period of time. Select narrative quotations in the data, which support this theme include but are not limited to:

- I use my two-hour commute to **critically examine** why something was successful in my class and what may have impacted successes and failures.
- I define reflection as **focused thinking** about my teaching. I do this informally after each class by asking myself what went well.
- For me, I reflect in a more informal sense most especially in my car, or late at night. It is those times that I am **most in my own head**.

- **Looking back** at an event in an effort to ascertain why what went well; went well, and why what didn't go well, didn't. The goal is to build on the things that worked and **rethink** the aspects that didn't.
- Reflection is the process of **self-examination** and **self-evaluation**.
- I reflect, **think, and analyze** past events.
- Practice of **revisiting** the experience and artifacts of a teaching encounter to **determine** what worked and didn't work.
- Reflection is the practice of professional **self-awareness**.
- **Brainstormed** solutions to the problem.
- **Consider** whether to repeat.

Whenever we think about our own thought process, we are engaged in metacognition; metacognition tends to be quite conscious and deliberate. According to Martinez (2010), this description goes beyond simple thinking. Participant responses indicated conscious and deliberate thoughts, such as critically examine, focused thinking, and self-examination and evaluation. Thinking is not simple or linear, but rather a complex micro-process which interacts with the reflective process, as seen in the Event Path model described above.

Boud, Keogh, and Walker (1985) refer to reflection as "activity in which people recapture their experience and think about it, mull it over and evaluate it," (p. 33). This orientation to reflection also confirms an understanding of the reflective process whereby events occur that individuals look back at and cognitively process. As reflection is metacognitive in nature, it brings the learner closer to his/her mental processing that occurs while learning takes place (Zohar & Dori, 2012). According to Zohar and Dori, usually metacognition refers to one's knowledge and regulation of cognitive processes involved in learning and productive activities.

According to Desautel (2009, p. 2001), reflection aids the construction of metacognitive knowledge by making formerly unconscious, intangible or reflexive processes or events explicit. Yanow and Tsoukas (2009) add that reflection can focus awareness and attention. Further, research by Weick and Sutcliffe (2006; Burr, Blyth, Sutcliffe & King, 2016) suggests that reflection stabilizes attention, focuses information processing, enhances awareness and ultimately leads to maturity of thought and, as a result, action. This was apparent through the use of terms by the respondents, suggesting the cognitive processing of events or experiences was an integral part of the overall reflective process, whereby events or experiences became explicit and problems were able to be formulated.

The cognitive perspective recognizes thinking, not exclusively behavior, as essential to understanding human nature, accomplishment and potential (Martinez, 2010). Martinez identified two broad classes of educational outcome-knowledge and the ability to think well-which captures much of what is desired from educational experiences. They also constitute what an educated mind brings to a complex world. Martinez expresses these two broad mental capabilities in the words learning and cognition. He argued, "we should promote the acquisition of knowledge (learning) but it should also nurture an ever-increasing ability to think clearly, creatively, and productively (cognition)" (2010, p. 4). According to Manzo (1992), this cognitive act is going beyond the information given to draw a new conclusion. When Brookfield (1990) advocates for critical reflection so as to have more informed actions, it is clear that informed actions can come from the act of cognitive processing within reflection.

In summary, cognition shouldn't be characterized as effortless; there are arguments for a more advanced way of thinking, which was demonstrated in many of the participant narratives. The literature outlining cognition reveals characteristics similar to that of the cognitive or affective components in the Event Path.

Change Point Terminology

In this study, there was an unmistakable pattern of change that derived from identification and correction of deficiencies in practice on the part of the participants during cognition. Their responses suggested that they mentally reviewed an event or experience looking for weaknesses that could be corrected or strengthened. Their behavior was interrupted by an observation that they were not functioning optimally so as to fully perform to a level of satisfaction. Evidence of a possible *change point* was found in 19 of the 23 narratives. There were a variety of ways in which this behavior interruption occurred. For some, it was reading student evaluations. For others, it was hearing from a peer either directly or in a written observation report. Yet others reported that they synthesized this conclusion after looking at student performance on tests and written papers. One professor wrote,

> A technique that I have found quite helpful is to try to do a written daily recap of each class that I teach. Sometimes the recap is quite brief; other days it may be somewhat detailed. When I teach the course again, I can refer to these daily recaps to reflect upon changes that need to be made.

Yet another professor wrote, "I define reflection as focused thinking about my teaching. I do this informally after each class by asking myself what went well, what didn't go as well and what I might change in the future." These professors, in these same narrative responses, shared stories about "replaying the events of the class in my head as I drove home after class." Another professor wrote, "I am really bothered when a class ends and I know it didn't work like I know it should have…I dwell on this for days, and I usually end up talking to two other professors about what happened in the class." The terminology supplied by the respondents in the survey narrative can be viewed as indicators of change in attitude or behavior, facilitating the professional development of college faculty. Furthermore, it was clear that affective elements such as satisfaction, and confidence or the lack thereof, were threaded through the response language and related to these other dimensions of human development and self-evaluation.

This is, as Wright (2009) wrote, a "best example" use of reflective and reflexive thinking: realizing that what we thought we knew about ourselves, in this case teaching performance, was not true and needed revision and revisiting. This confrontation with self, or interruption of behavior, seems critical for realizing change through reflection, and seems thus to be inseparable from the reflective pathway. The participants were determined to reach a different outcome "the next time" the class was taught, or the manuscript was submitted, or the interpersonal encounter was repeated. One professor wrote: "I look back on lessons, presentations and other pieces of work for ways to improve teaching and gain knowledge and suggestions for future lessons." Another professor wrote, "Reflection is self-examination…examining different aspects of your professional behavior and addressing areas that need improvement." For these and other professors in this study, reflection produced a conscious and identifiable (though perhaps not verbalized) moment of choice: I will not allow the next event to obtain the same outcomes as the last one.

This self-critique or evaluative mindset appeared to drive most decisions to change on the part of the participants. In fact, all but four of the individual maps that were created in the study included a specific moment in the life of the individual when the process led to a change in behavior with their professional practice. This observation supports that of Ebert and Crippen's (2010) use of language such as "confront…reform…acknowledge…and threat." This is the idea that motivation for change, at the individual level, may be best activated when it includes clear information about current or past performance that reveals a level of deficiency.

Nevertheless, it cannot be overlooked that for some, reflection is ultimately not entirely a tool for uncovering and rectifying deficiencies in performance or practice, but in fact a process of discovery of strengths and successes, and an opportunity to both celebrate those, and to confirm and plan for continuation in that same path. Four of the maps which emerged in the study described the reflection path for college professors who made a conscientious attempt to review information about a past experience for the purpose of future improvement. In these four cases, after cognitively processing information, these professors concluded that they were satisfied with their performance, that the event had not created tension or displeasure, but had, in final analysis, proven quite satisfying.

For these professors, change, rejecting and abandoning past practice in favor of a different future, would be abandoning past success in favor of an unknown. They held evidence that their past performance was worth repeating: positive student evaluations, reinforcing peer reviews, examples of student work that demonstrated that the students had learned well the concepts being taught. These professors found confirmatory evidence that the structural elements or characteristics of the event that they had both created and experienced fully met their individual goals. To clarify, it could be interpreted that change still occurred, but rather than in the form of a behavioral change, change occurred in the form of a new attitude of satisfaction. The awareness and ultimately satisfaction—a change in attitude—may not have happened had the participants not reflected on their events/experience(s).

CONCLUSION

In summary, learning from experience is revealed to be a highly structured and complex process based on reflection. Reflection in this case is seen as a formal, cognitive process, which incorporates information from the past experiences to either: 1) enhance perceptions of satisfaction with past professional experiences, or 2) in the case of a lack of satisfaction, engender a decision to change behavior or actions in the future. Reflection, in this model, is served by the use of tools, or cognitive memory aids, which objectify and clarify the past professional experiences. This process allows the individual professor to activate right brain hemispheric processes of cognition, which are essential for changing behavior and for growing in professional capacity.

There are several implications of these findings. First, the present research and findings are coherent when aligned with and considered through the lens of the adult learning literature. Much of the literature of adult learning has evolved with a conception of the *adult learner* within *adult education.* It is important to acknowledge that adult professionals, such as the university faculty in view in this study, respond and behave in their own individual learning in ways that manifest the observations and findings of this rich pool of literature, even though this population has generally been omitted in this literature.

Second, the author is confident of the findings in this study, particularly the treatment of the cognitive behaviors and cognitive tools manifested by the study participants. Nevertheless, it is clear from the findings of neuroscience and emerging understandings of hemispheric differences in cognition, that current formulations of cognition in much of the literature are simplistic and based on early descriptions of brain function. The finding that a large proportion of study respondents incorporated external tools (cognitive memory aids) to inform cognition separate from the original experience, may indicate an intuitive or cultural adaptation to brain function which may not yet be intuitive to this audience.

Third, and finally, the data maps developed from participate responses demonstrate both cognitive (Figures 2 and 4) and affective components (Figures 3 and 5). And while the cognitive dimensions of human function are addressed in this study, the affective dimensions less so. Emergent thinking with respect to embodiment in human cognition suggests this is simplistic and requires additional development, which is addressed below in the recommendations for future research.

FUTURE RESEARCH

From these findings and their implications, several openings to extend or expand this current study seem prudent and warranted. First, an expanded treatment and consideration of the neurological significance of the tools or cognitive memory aids is clearly warranted by this current study. The observation that most of the respondents used tools that objectified and clarified the past experience as an aid to their cognition is important. This path clearly has practical implications for the professional development of university faculty members.

Second, the current study addresses cognition as primarily a neurological function, even though numerous respondents (see Figures 3 and 5 as examples) described affective reactions to past experiences which guided their responses to their experiences. The relationship between cognition and affective

response—highlighted in the literature on embodied knowledge—is an important one requiring additional consideration with respect to university faculty and reflection.

Finally, in the current study, all of the respondents described an actual (authentic) past experience that served as the precipitating event for reflection. Nevertheless, a previous study (Wlodarsky & Walters, 2015) described the potential for reproduced events, i.e. simulations, case studies, role-play or gaming, to produce the same result. While the current data set do not support this, it may be that an empirical or experimental study might yield evidence to continue this line of thinking.

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