

## **2006-1617: A CASE STUDY TO EXPLORE LEARNING DURING A FACULTY DEVELOPMENT WORKSHOP**

### **Donald Elger, University of Idaho**

DONALD F. ELGER is a professor of Mechanical Engineering at the University of Idaho. Dr. Elger teaches "how to learn," entrepreneurship, design, and fluid mechanics. Dr. Elger has co-authored a nation-ally-recognized text in engineering fluid mechanics, has won the ASEE best paper award at the regional and national level, and has led the Enriched Learning Environment Project at the UI. Present research and practice areas, funded by the NSF, involve theory of learning, transformational leadership in higher educa-tion, and design of effective organizations and learning environments.

### **Scott Metlen, University of Idaho**

SCOTT METLEN is an assistant professor of Production Operations Management (POM) at the University of Idaho where he teaches Quality Management and POM topics in a faculty team that teaches an integrated business curricu-lum. His research interests include all aspects of process management--design, implementation, control, and im-provement of value-added processes. Scott is particularly interested in high level processes, such as the education and learning. These processes are interesting because they are challenging to manage and integrate.

### **Robert Carson, University of Idaho**

BOB CARSON is an instructor of Design Analysis in Mechanical Engineering at the University of Idaho. Mr. Car-son teaches teaming, math modeling and project management. He is semi-retired after a career in senior manage-ment in the manufacturing division for an electronics manufacturer and consults on various projects by the Me-chanical Engineering department at UI. Present activities include participation in a faculty focus group on transfor-mational leadership in higher education and facilitating construction of a "green" building for teaching/research.

### **Tristan Utschig, Lewis-Clark State College**

TRISTAN UTSCHIG is an Associate Professor of Engineering Physics at Lewis-Clark State College in Idaho. He is director of the pre-engineering program and currently teaches freshman and sophomore level engineering and phys-ics courses. Dr. Utschig's research focuses on assessment from the classroom level to the program and institutional level. He has published on teaching diversity, using technology in the classroom, and faculty development related to instructional design, assessment, and peer coaching. Prior to joining the faculty at Lewis-Clark State College, Dr. Utschig completed his PhD in Nuclear Engineering at the University of Wisconsin - Madison. His technical exper-tise involves analysis of thermal systems for fusion reactor designs.

### **Dan Cordon, University of Idaho**

DANIEL CORDON is a Ph.D. candidate in Mechanical Engineering at the University of Idaho. He teaches a course in Internal Combustion Engines that emphasizes mathematical modeling of thermophysical systems. He also teaches a senior laboratory course that introduces principles of experiment design and small-sample statistics. Dan's doctoral research involves use of catalytic ignitors to support combustion of water/ethanol fuel. Dan also manages the UI Small Engine Research Facility – helping students with the FutureTruck, Formula SAE, and Clean Snowmobile Challenge competitions. He received a UTC Student of the Year award in 2003 for his efforts.

### **Marie Racine, University of District Columbia**

MARIE RACINE is Professor of Languages and Acting Director of Assessment at the University of District Co-lumbia. In 2005, she served as co-chair of the institutional self-study that was submitted to Middle States for ac-creditation. Marie plays an active role in supporting faculty

development and strategic planning, coordinating a variety of collaborative projects for continuous quality improvement.

**Steven Beyerlein, University of Idaho**

DANIEL CORDON is a Ph.D. candidate in Mechanical Engineering at the University of Idaho. He teaches a course in Internal Combustion Engines that emphasizes mathematical modeling of thermophysical systems. He also teaches a senior laboratory course that introduces principles of experiment design and small-sample statistics. Dan's doctoral research involves use of catalytic ignitors to support combustion of water/ethanol fuel. Dan also manages the UI Small Engine Research Facility – helping students with the FutureTruck, Formula SAE, and Clean Snowmobile Challenge competitions. He received a UTC Student of the Year award in 2003 for his efforts.

## A Case Study to Explore Learning during a Faculty Development Workshop

**Abstract:** A central mission in the educational research community is to improve learning. The purpose of this project was to identify key factors that mediate in learning in the context of a faculty development workshop focused on assessment. Data were collected by a six person research-participant team using multiple approaches: direct observations, pre-workshop surveys; semi-structured interviews; a post-workshop prioritization survey; and a workshop e-journal. Analysis and triangulation of data revealed the five most significant factors impacting learning: (a) put the learners in the role of performer and provide assessment that helps the learners improve their performance, (b) concept attainment (especially distinguishing between assessment and evaluation), (c) modeling of best practices by the facilitator, (d) ongoing collaboration between participants throughout the workshop, and (e) schema that allowed participants to see commonalities in different types of assessment. Since learning is a complex process, attention should be given to all design elements in order to produce an enriched learning environment.

### 1. Introduction

In education, there is an emerging revolution in learning. This revolution, driven by external realities such as globalization, sustainability, changing societal values, and economics, will be empowered by research-based knowledge of “how people learn.” To characterize learning, we use the concept of a learning environment. A *learning environment* is the complex of factors, both internal and external to a context, that act on a community of people to influence construction of knowledge, development of skills, and development of identity. Examples of learning environments include: a classroom, a workshop, an academic department, a research team, a family, an organizational unit in a company, and a professional community. An *enriched learning environment* is an environment that is highly effective in producing growth in people that interact in the environment.

One way to think about learning environments is through the lens of design. From a design viewpoint, there are factors that the instructor or manager can control (independent variables) and corresponding dependent variables that result from the environment. Here, the independent or controllable variables are called “design elements” or “factors.” The present study focused on identifying design elements in the context of a faculty development workshop in the area of assessment. The research question was: “*For professors who are improving their knowledge of assessment and their ability to effectively assess others, what factors (design elements) or combinations of factors mediate in learning, attitudinal changes, and performance improvements?*” Important reasons to research faculty development include (a) effective faculty development produces “great coaches” who bring out the best in others, and (b) impacting a small community of professors impacts many students.

In summary, the objectives of the study were to identify factors that can be designed into a learning environment in order to elevate learning to high levels.

## 2. Description of the study

The research methodology was a case study involving a four-day faculty development workshop held at the University of Idaho from May 31 to June 3, 2005. The workshop was attended by approximately 32 faculty members and 3 graduate students. Participants came from three regional schools: University of Idaho, Washington State University, and Lewis-Clark State College. Participants represented a variety of disciplines and included administrators and classroom teachers. The workshop was facilitated by Dr. Daniel Apple, president of Pacific Crest ([www.pcrest.com](http://www.pcrest.com)), a company that specializes in faculty development.

The workshop was part of a continuing series of workshops held at the University of Idaho as part of the *Enriched Learning Environment* project. Part of the focus of the workshop series was on building community. The research team (6 people) came from this community. The research team included a graduate student, a professor with approximately 5 years of experience and four senior professionals. Two of the professionals have significant industrial experience with the disciplinary field known as quality management. Academic backgrounds of the research team are mechanical engineering (3), manufacturing (1), business (1), and sociology (1). The workshop facilitator has over 15 years of experience in faculty development.

The learning objectives of the workshop were:

- Learners will improve their abilities to perform quality assessment in multiple contexts.
- The workshop will change the learners' valuing of assessment with the result that they engage in assessment more frequently after the workshop is over.
- The workshop will create a desire within the learners for an academic culture in which there is effective assessment at the classroom, course, program, personal, and institutional levels.

The workshop objectives were highly challenging because academic culture is dominated by evaluation and there is little practice or emphasis on assessment. Assessment, as taught at the workshop, is the process of providing guidance and knowledge for the purpose of improving a product or performance. Assessment integrates observations, analysis, measurement, communication, and dialogue-rich feedback. The primary purpose of assessment is to help an assessee improve his or her performance--that is, assessment serves the needs of an assessee. Assessment can be performed by a coach (expert assessment), a peer (peer-assessment), or by the assessee (self-assessment). To classify actions as assessment, there are three essential attributes:

1. Intent--Actions are taken with the purpose of helping the assessee improve performance in areas where he or she desires help.
2. Knowledge rich--Actions provide specific and detailed information to help the assessee improve.
3. Judgement free--Actions are free of judgments where judgement means comparison to a standard.

Evaluation, as taught at the workshop, is the process of judging or comparing against established standards and reporting the results of this judgment. Evaluation, which is very common in academic culture, has the a primary purpose of establishing that quality standards are met. Evaluation often has high stakes such as passing versus not-passing a class or attaining tenure versus tenure denial. In general, evaluation is threatening to the evaluatee and causes feelings such as fear and anxiety.

To classify a process as evaluation, there are three essential attributes:

1. Intent--the process serves the needs of the people other than the evaluatee.
2. Judgement--the process involves comparison against a standard with consequences if standards are not met.
3. Reporting--the process involves reporting the results of the comparison to appropriate stakeholders.

In summary, most people in higher education have the concepts of assessment and evaluation confounded. Thus, producing learning outcomes during the workshop was a challenge of “*first-order difficulty*.”

### **3. Literature Review**

Since the workshop objectives were highly challenging, creating an effective learning environment was essential. One way to think about a learning environment is through theories of learning.

To characterize *adult learning*, Albert Knowles<sup>5-7</sup> proposed a theory comprised of four postulates: (1) adults learn most effectively when they are involved in the planning and assessment of their instruction, (2) adults learn best by experience, including opportunities to make mistakes, (3) adults learn best when the the learning is problem-centered rather that content-centered, and (4) adults want to learn knowledge that has immediate relevance to their job or personal life.

The experiential learning theory of Carl Rodgers<sup>8</sup> involves four principles: (1) Significant learning results when the subject matter is relevant to the personal interests of the learner, (2) Learning which is threatening to self (e.g., new attitudes or perspectives) is more easily assimilated when external threats are at a minimum, (3) Learning proceeds faster when the threat to the self is low, and (4) Self-initiated learning is the most lasting and pervasive. Rogers defined *cognitive* or meaningless learning as a technique in which the learner is focused on demonstrating competence by repeating back material in a similar form to the way it was presented. Rogers defined *experiential* or significant learning as a technique in which the learner is focused on demonstrating competence by accomplishing a valued result. The principal distinction between cognitive and experiential learning is that the latter stems from the needs and wants of the learner. To Rogers, experiential learning is equivalent to personal change and growth. Rogers believed that all human beings have a natural propensity to learn; the role of the teacher is to facilitate such learning.

Both Rogers and Knowles posit that learning is growth or development of self. This type of learning theory, called humanism is concerned with learner's self-direction, inner motivation, self-reflection, personal growth, creativity, and autonomy. Other proponents of humanism include Abraham Maslow, John Dewey, and Steven Covey. In addition to humanism, the workshop also made extensive use of teams and community learning processes. This type of learning theory, known as constructivism, has several well known proponents: Etienne Wenger, Jean Lave, Jean Piaget, Jerome Bruner, and David Jonassen.

One way to think about learning is from the reference frame of the individual; another approach is from the reference frame of the organization. *Organizational learning* is when a community advances their identity, constructs shared knowledge, and increases levels of skills. Organizational learning can be produced when members of the community have a shared vision of the goal state, they collaborate to reach the goal state, and they assess. Handy<sup>4</sup> proposes that the only way to survive in dynamic internal and external environments is to become a "Learning Organization" (LO). The only set theory of organizations is that continual adaptation is necessary for survival. One way the internal environment of an organization changes is through employee attrition and the employment of new employees. Another way is through development of the people within the organization.

Garvin<sup>3</sup> states that a learning organization "*is an organization skilled at creating, acquiring, interpreting, transferring, and retaining knowledge, and at purposefully modifying its behavior to reflect new knowledge and insights.*" (p. 11). Even though survival is dependent upon being a learning organization, few organizations are truly good at learning.<sup>3</sup> In a learning organization, dialogue enables the transferring of individual knowledge into expanded group knowledge that can be recorded as explicit knowledge reflected in policies and procedures. Individual knowledge comes from two sources: training and doing. Firms who do not encourage employees to venture outside of stated policies and procedures and provide resources such as training to empower employees with the necessary skills and confidence to venture will not reap the benefit of learning by doing.<sup>4</sup> Thus, leaders of LOs have structured their organization in such a way that learning can happen.<sup>11</sup>

Rolls<sup>11</sup> states that this structure should be one where employees' self-esteem should flourish due to relationships with peers and managers that promote dignity and security because everyone in the organization is willing to listen to and recognize each others' values and listen to their ideas; all care about each other as people. Through such a structure, the culture becomes safe and a person can respectfully say what they think about products and processes because of their system of understanding, cultured humility and compassion.<sup>10</sup> In such a culture, change will be driven from the bottom and seen as an opportunity instead of a top down driven challenge. Because employees see change as an opportunity, it will happen.<sup>9</sup>

To establish such a culture where learning can happen and subsequently be implemented, leaders have to make a commitment to make learning a sustainable competitive advantage. The learning has to be supported with continually allocated resources to continually nurture learning. Re-

source guardians typically allocate according to a firm's accepted vision. Thus, the vision has to clearly state that the firm will continually be a LO and all within the firm have to embrace that vision. To achieve acceptance of the vision, leaders have to model learning, 'do as I say, not as I do' does not work any better in organizations than it does in classrooms or families. To discover if learning is taking place and how to increase learning in the future, assessment of individual learning and the new knowledge that is being implemented into policy and procedures through group dialogue needs to be performed on a routine basis. If some individual or group of individuals refuses to learn, the learning environment becomes endangered and those individuals must be dealt with--either convinced to learn or encouraged to work for the competition.<sup>12</sup> The positive learning environment described has to be maintained to promote dialogue and thus, learning.

In summary, the literature provides rich and deep insights into the nature of learning. Some of these insights describe organizational learning and some describe individual learning. The contribution of this paper is explore learning by thinking about design factors that can be built into a learning environment. The rationale for design factor is that understanding of design factors allows a teach to quickly create an effective learning environment built on how people learn best.

#### 4. Overview of methods

Methods for acquiring data are summarized in Table 1. As shown, Table 1 lists the name of the instrument used, the purpose for using the instrument, and an overview of the instrument. In addition, we gathered approximately 32 hours of direct observations of the participants while they were engaged in learning and in performance. Using multiple people on the research team plus multiple instruments helped establish higher levels of trustworthiness because the multiple data streams provided a way to cross check the knowledge that we were constructing.

Name of Instrument	Purpose	Overview
Pre/post Survey	Determine base levels of knowledge so that so that we can understand how perceptions and knowledge changed during the workshop	A survey with eight open-ended questions taken (a) before the workshop and (b) at the conclusion of the workshop.
Interview Instrument	Develop rich and deep understanding of factors that were mediating in the learning of the workshop participants	A four question semi-structured interview. Interviews, each 15 to 20 minutes, were held with five participants during the workshop.
Factors Survey Instrument	Rank order the factors, both pro and con, that mediated in the learning of the workshop participants.	A survey with a list of 24 factors (pro) and 14 factors (con) that were prioritized by workshop participants at the end of the workshop.
Workshop E-journal	Identify factors mediating in their learning, and levels of performance in assessment.	During the workshop, group dialogue was paraphrased, recorded in real time, and displayed using a projection system. After editing, the subsequent record is the E-Journal.

## 5. Pre/post survey instrument

### Rationale and process

The purpose of the survey was to explore the depth and breadth of learning during the workshop. The steps for developing and applying the pre- and post-survey instruments were:

1. Brainstorming--Knowledge topics that are essential to assessment at the classroom, course, program and institutional level were identified. Topics where people commonly have misconceptions were identified.
2. Survey Development--Open ended questions were selected because they would not bias the results. Nine questions were designed and edited to ensure that they were clear, appropriate to project goals, and that they did not bias the participants. The final set of questions is shown in Table 2.
3. Pre-Workshop Survey--Participants filled out the survey in approximately 15 minutes at the beginning of the workshop.
4. Post-Workshop Survey--Participants filled out the survey in approximately 15 minutes at the end of the workshop.
5. Data Analysis--Responses on each survey were coded. Pre- and post-surveys were matched by demographic data and compared. Data were tabulated for each survey pair. Results were interpreted.

### Pre/post survey--results and discussion

Questions on the survey and a summary of the data analysis is presented in Table 2. As shown, the table summarizes how conceptualizations of assessment shifted during the workshop.

Question	Discussion of results
1. What does assessment mean to you?	Coming into the workshop, participants had significant confounding of assessment and evaluation. Leaving the workshop, participants had reduced their level of confounding while improving understanding of the essence of assessment. Confounding had not been eliminated.
2. What does evaluation mean to you?	Conceptualization of evaluation was not changed during the workshop.
3. How is assessment practiced in your college functional area?	At the end of the workshop, participants recognized that assessment is less prevalent than they thought at the beginning.
4. Why is assessment important?	Conceptualization shifted significantly from assessment as a means to identify problems to assessment as a means to facilitate professional growth.
5. Rank order the five most important areas you assess.	Conceptualization shifted from assessment in one context (student) to multiple contexts including self, institution & program.
6. How frequently do you assess?	Both pre- and post-data showed wide variations in frequency.



7. What methods/approach do you use to assess?	Many different methods are used. Conceptualizations of what methods are assessment shifted during the workshop.
8. When assessing processes versus outcomes, when and how do you assess the process? When and how do you assess the outcomes?	Conceptualizations of what constitutes assessment shifted significantly during the workshop. There is very little assessment of outcomes.
9. How do others within your college functional area value assessment?	Post workshop data showed that the academic culture is evaluative--while faculty value assessment in principle, there is not much valuing of authentic assessment because people do not understand what assessment is.

## 6. Interview instrument

### Rationale and process

The purpose of the interview instrument was to identify key factors and to understand how the participants described these factors. The steps to design and apply the instrument were:

1. Interview Question Development--Questions were generated and selected according to four criteria: (a) non-threatening for participants--leads them to open up, (b) foster reflective thinking, (c) helps participant identify pro- and con-factors relevant to their learning, and (d) free of interviewer bias.
2. Interview Instrument--The instrument, presented in Appendix A, consisted of five main questions. The main questions evolved from the general to the specific in order to build rapport during the interview and generate a rich data stream in the allotted time frame. Each main question contained several sub-questions that were used to help elicit or redirect responses. The sub-questions usually not necessary; they were used three or four times during the interviews.
3. Interview Protocol--To conduct interviews in an identical fashion, a procedure was established. (a) The research questions were introduced to the interviewees and permission was obtained to use and record their responses. (b) A short introductory story was provided so that the interviewees would understand the purpose of the interview. (c) Questions were asked with every effort put on minimizing intrusion by the interviewer and maximizing listening according to guidelines for interview techniques.<sup>1,2</sup> (d) Two researchers participated in the interviews--one researcher conducted the interview and the other researcher observed for bias, operated a tape recorder, and transcribed observations.
4. Practice Interview--The questionnaire and protocol were practiced and improved.
5. Interviews of Participants--Five participants were selected with the criteria being diversity of experience, school, rank, and gender. Interviews were conducted between the second and fourth day of the event. Each interview lasted between ten and fifteen minutes. Data recording process included observation of non-verbal communication, notes hand-recorded by the interview observer, and audiotape recording of the conversation with subsequent transcription.
6. Analysis/Coding--The researchers reviewed the manually recorded data and identified 11 emergent themes. Preliminary analysis was followed by a detailed coding process that involved the transcribed interview data. This second coding process was done separately, with-

out reference to the initial coding process in order to remove any bias in the interpretation of the transcribed data. Although category titles varied slightly, it was notable that the same themes emerged.

### Interview instrument--results and discussion

Results are shown in Table 3. The top part of the table shows the factors that were positively impacting learning for each of the five interview participants, P1 to P5. The bottom part of the table shows the factors that were negatively impacting learning. Both parts of the table are sorted by the number of times the factor was reported.

Table 3 Factors mediating in learning as revealed by interview data					
	P1	P2	P3	P4	P5
<b>FACTORS AIDING LEARNING</b>					
Opportunity to try assessment many times--learn by doing	x	x	x		x
Purposeful improvement after each cycle of assessment	x		x	x	x
Teamwork	x	x	x		x
Receiving assessment feedback in real time		x	x	x	
Workshop is personalized to meet the needs of each participant--context engages people	x	x		x	
Vertical integration of concepts		x		x	x
Reflection time	x	x	x		
Community - shared purpose among participants	x			x	
Alignment of learning objectives with content	x			x	
Peer assessment		x			x
Modeling by facilitator	x				
Perception checks		x			
Coaching			x		
<b>FACTORS HINDERING LEARNING</b>					
Too much to master/content overwhelming	x		x	x	x
Lack of knowledge in background material	x			x	x
Perfectionism	x				
Not completing assigned homework	x				
Lack of technology for teams - computer/printer		x			
Spinning wheels - not asking for help		x			
Switching teams/projects too much			x		
Availability of facilitator			x		
Gender issues				x	

The benefit of learning in a team environment was one of the most significant themes emerging from the interview data. Teams were perceived to greatly elevate learning rates and to add richness to the learning experience. Closely related to the team concept was the overall value of real-time assessment as a means to increased performance and accelerated learning. Specific types of assessment (self, peer, coach) were mentioned by different interviewees, but the value of obtaining that feedback in real time was nearly universal.

*“I enjoyed working with the teams. I really felt that ... that really felt good to me as a learner. I felt like it really accelerated my learning. I couldn't see doing it by myself, you know sitting there trying to process this stuff alone. And part of the group is just practicing it being in the midst of other people are in varying degrees of confusion...It's kind of fun, to be in that group and to just be kind of exploring things together.”*

Learning by doing was also a key mediating factor in participant learning during the workshop. This concept was closely tied to the concepts of cyclic improvement through repeated application of concepts across multiple contexts and the importance of a learning environment aligned with personal needs and contexts.

Two more areas where participants found that their learning was enhanced were the fact that content could be vertically integrated across multiple contexts relevant to their educational practice, and that personal reflection time (both during and external to the workshop) was extremely important. The value of personal reflection time can be viewed as a natural corollary to working in a learning environment aligned with personal needs and contexts.

*“Certainly there's an element of reflection that I have to do in order to practice on something for the context that I'm engaged in. So having the projects like we had today, where I could work on a particular class, writing the objectives, going through and doing the outcomes for that. That's personalized for me and I can become fully engaged. That's how I learn.”*

Finally, two related factors were found to be hindrances to participant learning during the workshop. These were a lack of knowledge in the content area and an overwhelming amount of content to process during the event. This combination of factors was frustrating for all but one of the interviewees.

## **7. Web E-Log Instrument**

### **Rationale and process**

The purpose of the Web E-Log instrument was to document knowledge and results created during a workshop. Steps for developing and applying the Web E-Log were:

1. Design--Prior to the workshop, the web site was constructed and files were labeled to identify the time, date, and location of the event. The web site was set up to provide resources to participants: workshop information, schedule, and links for preparatory reading.
2. Data Capture--During the workshop, data were captured in real time by a designated recorder who typed the results onto a screen that was visible to all workshop participants. Recorders were selected from workshop participants and the recorder role was rotated during the event.
3. Data Posting--As the workshop progressed, journals and files were posted to the web page.
4. Data Analysis--At the completion of the workshop, files were reviewed and usage by workshop participants was tracked.

## **E-log--results and discussion**

For the workshop, 47 linked files were created--see reference 13 for the website URL. The Web E-Log influenced faculty behaviors during the workshop. During the first day, most participants were taking detailed notes. Early on the second day, participants were shown the web page where files were being posted, and introduced to a person who would post files they requested. By the end of the second day, there were only two external requests for files to be posted. On the third day, the web page was shown again, and some of the content on the page was displayed, and a poster board was provided where people could write file requests. By the end of the third day, there were over a dozen participant requests for files to be posted. Because of the Web E-Log, the participants were taking fewer notes as the institute progressed, thereby spending more time participating in group interactions.

By tracking bandwidth flow on the website, we were able to determine there was a significant (peak of 4x) increase in information accessed from the website for the two weeks following the institute. Even after reaching a steady-state condition, the amount of data being accessed through the web site has increased compared to before the institute. Rather than downloading and storing the files locally, it appeared that participants are using the site to access files on an as-needed basis.

## **8. Factor Survey Instrument**

### **Rationale and process**

The purpose of the factors instrument was to prioritize design factors. Steps for developing and applying the instrument were:

1. Identifying factors--Using the interview instrument, data from a workshop assessment done at the end of day 1, observational data, and the interview data, the research team identified 24 factors that were positively impacting learning and 17 factors that were negatively impacting learning.
2. Assessing factors--The research team examined and edited factors using criteria:
  - a. independent--factor is controllable by a facilitator
  - b. unambiguous--factor has the same interpretation by workshop participants
  - c. clear--the factor is understandable by workshop participants
3. Creating instruments--Create a short document so participants can rank order the positive factors. Create a separate instrument to rank order the negative factors. This was done using a one-page survey for each set of factors.
4. Gathering data--At the end of the workshop, participants filled out the pro and con surveys. Surveys were anonymous and participants were encouraged to provide open and honest feedback.
5. Processing data--Pro- and con factors were rank ordered. Factors that had a lesser effect were discarded.

## Factor survey--results and discussion

The factors that helped participant learning are shown in Table 4. This table shows the most significant factors sorted by priority. The numbers in Table 4 correspond to participant priorities. When a participant identified a factor as “the most important” this factor was assigned a value of 10. Similarly, the 7<sup>th</sup> most important factor was assigned a value 4.

FACTOR	Points	Surveys ranking factor $\geq 6$	Surveys ranking factor $\geq 8$	Surveys giving factor a score of 10
Assessment to improve participant performance in tasks relevant to faculty responsibilities	146	17	6	3
Modeling by facilitator	145	16	12	1
Teamwork--cooperative learning	138	13	8	5
Assessment to improve participants ability to assess	125	10	6	3
Community--common purpose in group	124	12	6	3
Learner-centered approach	111	11	8	4
Experienced people at the workshop	107	12	9	1

Table 4 shows that three factors (assessment, modeling, teamwork) were ranked as the most important. Notice that teamwork received the most selections (5) as “most important factor,” whereas modeling only received one selection as the “most important factor.”

Factors that impaired student learning are shown in Table 5. Similar to Table 4, this table shows those factor that emerged from the data as “most significant.”

FACTOR	Points	Surveys ranking factor $\geq 6$	Surveys ranking factor $\geq 8$	Surveys giving factor a score of 10
Definition of Terms (concept attainment)	183	23	13	6
Preparation by participants	154	16	9	3
Breadth of Content--too much	141	14	12	4
Pace of content--too fast...	140	12	9	5
Need for an organizing structure (schema)	136	15	7	1

As shown in Table 5, concept attainment was the largest barrier to learners. Concept attainment means that learners can classify examples into concept categories, thereby demonstrating the

ability to distinguish assessment from evaluation. Data from this workshop and other experience have revealed that nearly all professors have assessment and evaluation confounded.

The research team believes that the next three factors (preparation, amount of content, and pace) were related to the following cultural assumption: *During formal learning, the learner needs to acquire nearly 100% of the content.* During learning situations that are not in formal setting (example--learning to design; doing a research project) people acquire a foundation of knowledge and then they learn by doing. Hence, the factors (preparation, amount of content, and pace) were dropped as significant for an effective learning environment. An improvement in the workshop is to help the participants discover that they can construct their knowledge as they go without the usual academic practice of front loading most of the content.

The last factor (schema) was highly significant. In addition to emerging in Table 5, there were significant conversations during the workshop and several participants began constructing their own one-page diagrams to identify the common features of assessment in varied contexts (course, self, program, etc.)

## **9. Summary discussion--finding design factors that impact learning**

### **Rationale and process**

The project objective was to “explore learning” by identifying and prioritizing controllable variables that impact learning. A summary of the complete process is:

1. Identify data needs--Before the workshop, the research team identified types of data needed and instruments to measure these data.
2. Data processing--During the workshop, the team processed the rich flow of incoming data and created ways of communicating these results using “design-elements” communicated through the point of view of the participants.
3. Design factor prioritization--Using the factors instrument, the team acquired data for prioritizing.
4. Synthesis--The team processed data from the factors instruments (e.g. Tables 4 and 5). The team then make decisions on combining factors, discarding factors and on prioritizing factors. Finally, the resulting factors were written in positive language that informs a teacher what they need to do in order to create an effective learning environment.
5. Connections--The team connected the design factors to the knowledge from the literature review.

### **Results and Discussion**

Table 6 presents the design factors. The left column shows the design factors, sorted into priority order. The right columns show how design factors align with the knowledge that is presented in the literature review. A value of 3 is a “significant relationship” and a value of 1 means that there may be a relationship, but the relationship is not apparent. Note that each numerical values is a basic guidelines based on judgments of the authors.

Table 6: Design Factors compared with literature review. Ranking scale: 3 = significant relationship with design factor; 1 = possible relationship with design factor.

DESIGN FACTOR	LITERATURE SOURCE			
	Knowles: adult learning	Rogers: experiential learning	Constructivism	Organizational learning
<u>Assessment</u> --put the learner in the role of performer and help them improve their performance through quality assessment	3	2	3	3
<u>Concept attainment</u> --help the learner distinguish between concepts that are commonly confounded	1	1	1	1
<u>Modeling</u> --live the way you want your learners to be (walk the walk)	2	1	2	2
<u>Collaboration</u> --set up conditions so that people work together	1	1	3	3
<u>Schema</u> --provide “maps” that help learners see how the concepts and ideas fit together.	1	1	1	1
<u>Common purpose</u> --help learners understand that they share common goals	1	2	2	3
<u>Learner-centered approach</u> --focus instruction on outcomes desired by the learners	3	3	3	2
<u>Experienced people</u> --bring experienced people into the learning environment and use them to help newcomers	0	1	2	2

Table 6 shows that a specific design factors aligns with some learning theories, but not with all learning theories. For example, the factor labeled “common purpose” is well aligned with organizational learning, but not with Knowles’ androgogy. This finding suggests that design factors inform learning in a different way than learning theories. In particular, design factors bridge theories of learning and provide an alternative way to think about the design of effective learning environments.

Table 6 shows that some design factors such as “schema” are not aligned up information that was reviewed in the literature review. The reason is that the literature review omitted two broad families of learning theories--cognitivism and behaviorism. The design factor “schema” is aligned with cognitivism. This suggests that the workshop design could have been improved by incorporating principles from both cognitivism and behaviorism.

### Impacts of the workshop

At the conclusion of the workshop, participants were given the opportunity to describe their experience. The words that consistently emerged were “changed my life, transformed me, a transformational experience...” Overall, the end of the workshop felt like a religious revival. These

data support the conclusion that the workshop was successful in producing outcomes in a challenging area of faculty development.

The next workshop (October, 2005; theme was program assessment; 2 days) provided evidence of the impact of the assessment workshop (May, 2005). To convince faculty members to attend the May workshop, organizers spent considerable effort in recruiting. For the October workshop, there was no recruiting, yet the attendance more than doubled. Following the October workshop, faculty groups went forward to the administrations (provost level) at all three institutions and lobbied for the administrations to get involved in assessment so that assessment could be continued, propagated, and advanced at all three institutions.

## 10. CONCLUSIONS

The purpose of this research project was to identify design elements (factors) that mediate in learning by professors in the area of assessment. The five most significant design factors are:

1. Assessment--design the environment so that the learner becomes the “performer” in activities that are relevant, complex, and challenging. Then, provide each learner with the opportunity to experience assessment at a level of quality that produces noticeable improvements in their performance.
2. Concept attainment--design pedagogical strategies that help learners distinguish concepts that are typically confounded. In the context, this means distinguishing assessment from evaluation. Help professors learn when assessment is the appropriate process, when evaluation is the appropriate process, and how to align assessment with evaluation so they work together synergistically.
3. Modeling--as a teacher, actively practice that which you are teaching (e.g. assessment in this case study) in your day-to-day life--live the change you want your learners to experience.
4. Collaboration--set up effective team-based learning so that professors can work and learn together.
5. Schema--design the environment so that learners see how concepts and principles are related. For assessment, the schema would show commonalities of assessment practice across contexts: self-assessment, classroom assessment, course assessment, program assessment, and institutional assessment.

Other design factors that rose to high levels of significance include:

6. Common purpose--design the workshop so that the community of learners establish shared understanding and valuing of the learning outcomes.



7. Learner-centered approach--find the outcomes desired by each learner and set up conditions to meet outcomes of each individual.
8. Experienced people--set up conditions so that experienced people can guide newcomers as they learn in the performance area.

Because the case study research method is qualitative, the purpose of this project did not include generalizing the findings to other contexts. However, most of the design factors listed above appear to be relevant to the design of learning environments in other contexts. Future studies will continue to identify the factors needed to create enriched learning environments.

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## Appendix A: Interview Instrument

The interview questions, in bold, were asked to each participant. The probe questions, in italic were guides for follow up questions. That is, probe questions may or may not have been asked.

**1. Take me back through the history in your career that brought you to this institute. What types of professional development have you previously experienced?**

*What is your background working with faculty in professional development?*

*What is an area of strength or expertise for you in the science of learning?*

**2. Can you describe some details of what you have gained from this institute?**

*What about your gains as a learner?*

*Is this experience similar to your expectations?*

*What is your previous learning experience in this type of environment?*

**3. Can you walk me through the personal learning process you have gone through as a participant in the institute?**

*Have your feelings about doing assessment changed during the institute?*

*How did you feel at the beginning, middle, and end of each day?*

**4. What factors most helped/hindered your learning during the institute?**

*Why?*

*How?*

*Here is a list of potential factors that may help you...*

*What were some challenges you faced in the last few days here? Why?*

*What activities gave you the most success in achieving your goals here? Why?*

**5. Can you describe a specific incident that sparked significant growth for you during the institute?**

*How about growth potential?*

*If no incident comes to mind, how about a task or exercise?*

*Why was this incident significant?*

*What will the future impact of this incident be?*