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From Theory to Practice: Insights into Faculty Learning from the Mellon Library/Faculty Fellowship for Undergraduate Research

The literature of American Higher Education is rife with scholarly and popular books, journal articles, and web sites on the topics of adult learners and adult learning. Some address the topic from a theoretical perspective, sharing a range of observations on adult learners based on years of research representing a variety of disciplinary approaches. Others consider adult learning from a more practical, "how to" viewpoint, examining the conditions that need to be in place in order for adult learners to best learn. This paper addresses the work of leading American adult educational theorists, shares empirical data gathered on faculty learners over course of the four year Mellon Library/Faculty Fellowship for Undergraduate Research at the University of California, Berkeley and raises issues concerning the impact of both physical and social learning environments on adult learning.

Origins of American andragony

Andragogy is commonly described as "the art and science of helping adults to learn". It complements pedagogy, "the art and science of teaching", which comes from the Greek words meaning "to lead the child". While there is currently no single unifying theoretical model existing in the field of adult education in the United States, there are several existing schools of thought that have collectively informed the study and practice of adult education. Common to American adult educational thought is the belief that learning should be driven by the needs and interests of the adult learner. The work of early Twentieth Century educational reformer John Dewey was regarded as revolutionary during an era when "learning" consisted mostly of the rote memorization of facts and figures. Dewey believed learning resulted from the

learner's direct experience. Knowledge resulted from "doing," and the ways in which learners defined and solved problems was central to their learning. In Dewey's mind, learning was a process that began with a real life problem from which the learner generated a hypothesis, gathered evidence, and ultimately either confirmed the hypothesis or formulated a new one. Dewey also described a process of "assessing one's belief" as critical to the learning process. Later, this process came to be further developed and referred to in the literature by others as "reflection".

In contrast to Dewey, and with roots in the nineteenth century, Behaviorists observed the problem solving behaviors of animals and humans and from this, came to describe learning as a series of behaviors. Their work provided the theoretical framework for programmed or modular instruction in which learning is broken into small discrete steps which, when properly performed, are rewarded with positive reinforcement. Humanists, on the other hand, focused on creating an environment conducive to learning: providing the flexibility to match learning options with the learner's individual learning styles and preferences; creating a warm and supportive atmosphere; emphasizing interaction between teachers and learners and among learners themselves, and in general, building learning around the needs and interests of the learner.

Developmental Psychologists sought to describe how learning takes place within the human life cycle, whether in terms of discrete lifetime phases (e.g. leaving home, entering the work force, etc.) or in the stages of human psychological growth (e.g. dependency, conformity to rules, awareness of oneself in relationship to a group, recognition of personal inter-dependency, etc.). They sought to describe how these factors affect the learner's readiness to learn. Critical Theorists critiqued how teaching and learning were being conducted, primarily in relation to how they suppressed either individuals or groups of people. They viewed adult education's primary purpose as being social reform and characterized "reflection" as a critical process in adult learning where learners are encouraged to critically question the information and opinions presented to them by the dominant culture.

Malcolm S. Knowles is widely acknowledged as the father of American andragogy. While he originally characterized pedagogy (childhood education) and andragogy (adult education) as opposing entities, Knowles

later acknowledged that the seeming divisions between pedagogy and andragogy were not necessarily hard and fast and more naturally occur along a single continuum.

Knowles' mentors included Eduard C. Lindeman (The Meaning of Adult Education,New York: New Republic, Inc., 1926), who was among the first to identify the unique characteristics of adult learners. In his own work, Knowles recognized that some teachers appeared more effective in working with young adult learners than others. He made a set of observations about these teachers: they involved learners in participatory activities; they assumed a more informal role in the classroom; they were interested in their students as people; and they provided supportive help.

Knowles observed that Educational Psychologists at the time were studying student responses to teaching rather than studying the learning process itself. With Cyril Houles, he began a study of how continuous learners go about their learning, and from laboratory work he conducted, he was able to collect more data about the unique characteristics of adult learners than had ever before been documented. By 1980, he had assembled enough data to organize around a framework of principles, assumptions, and strategies. He asserted that no single approach to adult learning is right or wrong and that the learning approach should be chosen deliberately, based on the given set of circumstances. If, for example, adult learners are faced with an entirely new subject content area, they may benefit initially from a more didactic and content-rich approach in order to ground their learning. In most situations, however, a more self-directed, "andragogical" approach will prove to be more engaging to the adult learner.

According to Knowles, the learner's characteristics should strongly influence the choice of approaches, methods, and materials. The following key components are included in his framework:

- the critical importance of self-directedness to adult learners
- the need to capitalize on the adult learner's past experience
- the adult learners' readiness to learn as being dependent upon their identification of a specific need or problem
- the interactive nature of adult learning
- the importance of learners and teachers co-planning the learning experience

- the fact that students – sharing their significant past experiences – can not only teach one another, but can also "teach the teacher."

Dewey	Behaviorists & Humanists	Developmental Psychologists	Critical Theorists	Andragogists (Knowles et al.)
Pragmatic Learning starts with a real life problem Learner learns by "doing" Emphasized problem solving & critical thinking skills as a means of broadening the intellect Learner questions personal beliefs What is learned is fully integrated into learner's life	BEHAVIORISTS Described learning as a series of behaviors Stress the importance of feedback HUMANISTS Advocate methods & techniques that "shape" learning Emphasize group work Choose interactive methods	Study changes occurring in humans from childhood to adulthood, e.g.: • problem solving skills • conceptual understanding • identity formation • moral understanding and how they affect the learner's readiness to learn	Emphasize: • reflection • growth • transformative learning Learning linked to societal change	Learning is interactive Teacher & learner mutually plan the learning experience Students can learn from one another and teachers can learn from students

Table 1: Adult learning | Informative schools of thought

Characteristics of child versus adult

The work of many of these researchers resulted in educators being able to profile the "typical" childhood learner and compare this with the profile of the "typical" adult learner. These sets of observations can prove very helpful in deciding how to plan learning experiences and activities for the advanced user.

Pedagogical Model Childhood Learners	Andragogical Model Adult Learners
Learners are externally motivated (e.g. by parents, teachers, grade competition, etc.)	Learners are internally motivated (by the desire to perform better, master a skill to use in their work, solve a real life problem, etc.)
Learners view learning as the mastery of subject content	Learners view learning from a problem-centered orientation
Learners' readiness to learn is determined outside of themselves (e.g. by teachers, school systems, curricula, etc.)	Learners' readiness to learn is determined by their need to know or do something that contributes their effective performance in some area of their lives
Learners are dependent	Learners are self-directed; being independent and self-directed is critical to their self-concept
Instructors decide • what is to be learned; • how it is to be learned; • whether it has been learned	Instructors take on a more of a facilitative role
Learners come with limited experience	Learners come with extensive experience which actively contributes to their and others' learning
Curriculum is organized around content units and structured sequentially	Curriculum is organized around life situations and problems not subject content

Table 2: Assumptions about childhood versus adult learners

Findings on faculty learners: the University of California, Berkeley Mellon Library / Faculty Fellowship for Undergraduate research

Over a period of four years, the Library at the University of California (UC), Berkeley has gathered empirical data on faculty learners as part of a new and larger initiative it undertook in partnership with other academic support units on the campus. The initiative is known as the Mellon Library/Faculty Fellowship for Undergraduate Research was founded on the principles that (1) the library can play a leadership role in creating learning environments that allow faculty to teach in new and more discovery-based ways; (2) the responsibilities for instruction in library research and information skills are shared by the entire campus; and (3) librarians can (and should) effectively partner with faculty in the design of courses, curricula, and assignments.

Stakeholders in American higher education have called upon faculty to assume new roles and responsibilities for the design of student-centered liberal education programs with particular emphasis on interdisciplinary problem solving and the development of transferable skills. Some have noted how faculty often are not trained as teachers and therefore require significant institutional support to meet these changing expectations. Closing the gaps between curricular (faculty) and co-curricular programs (library, general education, freshmen experience, etc.) while working with other academic support units (educational technology and teaching centers) can be an

effective means of supporting faculty as they move in needed, new directions to restructure courses and curricula that support independent discovery and self-directed learning.

At Berkeley, as elsewhere, higher education administrators and faculty are increasingly being required by a variety of stakeholders to demonstrate their value and effectiveness. That value, in addition to research distinction, is increasingly being defined in terms of student learning.

Beginning in 2002, the University Library at Berkeley initiated a campus-wide conversation with other academic support units interested in the developing interactive, research-based, and technologically facilitated learning experiences for undergraduates. The resulting group, named the Campus Academic Partners, drafted pilot and follow-on funding proposals, grounded in the development of a long-term, sustainable campus collaboration, the aim of which was to share skills and leverage resources to promote and realize the redesign of undergraduate courses and curricula which emphasize the development of library-based undergraduate research skills. The Partners realized that a scalable model for developing undergraduate research skills and discovery-based learning on the campus must begin with campus faculty, who oversee the curriculum and who are the primary agents of curriculum reform on the campus.

The collaborative infrastructure developed by the Academic Partners supports faculty interested in these new ways of undergraduate teaching that incorporate library research skills and the ability to analyze, evaluate, and use information ethically as key learning goals of the courses they design and teach. With support from the Andrew W. Mellon Foundation, the Academic Partners began their work by designing the Mellon Library/Faculty Fellowship on Undergraduate Research Institute. Offered each summer from 2003 to 2006, the six-day Institute was designed to model active learning and assessment strategies through the use of in-class activities, discussions, written reflections, media, and a range of assessment methods. Faculty selected as Fellows discussed a range of topics related to developing effective undergraduate research-based syllabi and assignments. They were encouraged to write learning outcomes for their courses and to design assignments that would challenge undergraduates to use the Library's print and digital resources and engage in the process of scholarly discovery.

By the end of the four-year Mellon Library/Faculty Fellowship for Undergraduate Research Project, forty-eight faculty from a wide range of disciplines participated in a series of activities beginning with the annual Mellon Library/Faculty Institute. Following the Institute, Fellows were partnered with Implementation Teams (iTeams) made up of librarians, instructional technology experts, pedagogy experts, and other academic support staff. The teams provided feedback and worked with faculty to refine syllabi and assignments, and integrate technology and assessment into course development where appropriate.

Fellows could submit post-Institute proposals for additional funding. Collections funds provided by the Library were used to acquire or digitize materials in support of Mellon-related courses. Innovation Funds provided by the Project were used to support scaleable and sustainable changes to the curriculum, departmental implementations, and teaching tools that incorporate information competencies, research skills and the use of campus information resources as integral components, and to assess the impact of research assignments on student learning and faculty teaching.

In these ways, the Berkeley Library aimed to foster campus wide changes in the curriculum and support the faculty in their emerging responsibilities for student-centered and discovery-based learning.

UC Berkeley data on faculty learners

In conjunction with the Mellon Project, an ambitious evaluation framework was developed and implemented over the course of the four year project. Details of the framework are available at http://www.lib.berkeley.edu/mellon/evaluation/2006_evaluation_framework.pdf.

The framework allowed us to determine the extent to which the project goals and objectives were met as well as to measure the project's and the Institute's impact on individual faculty members, on student learning, and on the campus culture of teaching.

From the original Pilot Project (2002-2003) through the final Mellon Faculty Institute (June 2006), both formative and summative evaluation data on faculty learners' learning preferences and suggestions for improvements was collected and analyzed by the Project Manager. This was carried out by administering pre-Institute, mid-Institute, and post-Institute surveys of

faculty participants. Copies of the survey instruments are available at http://www.lib.berkeley.edu/mellon/evaluations/surveys.html.

The data was also used for the duration of the project to make informed changes in the Institute's requirements, organization, content, and learning activities. Interestingly, in response to the pre-Institute survey question asked of faculty, "What convinced you to apply for the fellowship?" one hundred percent of respondents highlighted "learning more about library resources" as being a powerful motivator.

Having studied the faculty's top-rated Institute sessions, we found that they shared the following characteristics:

- They involved OBSERVATION
  Top rated sessions included viewing films or videos related to the library, student learning generally, and Information Literacy learning in particular; they also included sessions which invited faculty to serve as observers of a student focus group discussion in which students critiqued a "real life" library research assignment and demonstrated how they would go about accomplishing the assignment.
- They were PRACTICAL
  Other top-rated sessions included peer presentations made by previous Mellon Faculty Fellows who were asked to share the particulars of how they had integrated the development of student Information Literacy skills into their actual course design and assignments. They included practical examples of how to accomplish this.
- They were CUSTOMIZED
  Faculty participants repeatedly mentioned their preferences for personalized, one-on-one feedback, either while working with their Implementation Teams (i-Teams) or in exercises that involved discussing their actual syllabi and assignments with faculty peers.

During the mid-point of each Institute, Mellon Fellows were asked to comment on what they wanted more of, and what they wanted less of during the remainder of each Institute.

Faculty learners wanted MORE:

- QUESTIONING about what Fellows knew and what they wanted to learn

- DISCUSSION – in pairs, in small groups, and in larger groups
- Interactive, HANDS-ON activities
- Practical experiences – rather than theories, they wanted to see CONCRETE EXAMPLES of model syllabi and assignments
- INDIVIDUALIZED FEEDBACK – from peers, Institute Facilitators, and i-Teams
- TIME TO WORK ON THEIR OWN syllabi and assignments
- BRAINSTORMING – learning from one another's ideas

Faculty learners generally wanted LESS:

- THEORETICAL ABSTRACTIONS – learners wanted to focus on to what could be practically implemented
- GENERALIZATIONS – learners preferred the concrete
- "POWERPOINT lessons" – learners preferred interaction to listening
- of "anything that felt like a LECTURE"
- STATISTICS – saturation with numbers and facts
- HASTILY run through DISCUSSIONS – ample time allotted to discussion – in pairs, small groups, and large groups

Having studied the faculty's lowest-rated Institute sessions we found that they too, shared some common characteristics:

- They were described as TANGENTIAL
  Their topics were viewed as only marginally connected to the Institute goals and faculty interests.
- The were PASSIVE
  Faculty learners generally disliked having to listen to lectures.
- They were related to the topic of ASSESSMENT
  Faculty learners mostly disliked the mention of standards, taxonomies, or attempts to measure student learning against formally stated learning outcomes.

At the conclusion of each Institute, Mellon Fellows were asked to comment on the most and least valuable aspects of the Institute.

Faculty learners MOST LIKED:

- QUESTIONS AND INSIGHTS FROM COLLEAGUES representing different disciplines
- LEARNING FROM PEERS – again, learners like plenty of time for discussions, reactions, and exchange

- INTERACTION with the Institute Facilitators, Library Partners, i-Teams
- Getting to know one another; building a COMMUNITY OF COMMON INTEREST
- INDIVIDUALIZED FEEDBACK from peers, facilitators and i-Teams
- TIME TO REFLECT and to focus their thinking
- HANDS ON PRACTICE – concrete activities with concrete feedback
- "Experiencing research from my students' perspective"

Faculty learners LEAST LIKED:

- Use of "ed speak" | educational jargon
- Discussion of standards and taxonomies (including the American Association for Higher Education's Information Literacy Standards for Higher Education (!) and Bloom's Taxonomy)
- Lack of context for some of the exercises
- "Formulaic" exercises; filling in worksheets
- Homework assignments
- "The big cookie that comes in our lunch box." (only one faculty member thought to add this comment.)

Finally, at the end of each Institute, the Fellows were invited to contribute suggestions for improving any and all aspects of the Institute. Based on their suggestions, the Steering Committee made the following improvements to the annual Institute over the course of the project:

- Shortened the duration of the Institute from nine days to five days;
- Eliminated tangential topics;
- Severely reduced the amount of required reading and homework assignments;
- Provided more opportunities for discussion among faculty peers;
- Provided more personalized, one-on-one consultation and feedback on syllabi and assignments;
- Reduced the number of lecture sessions;
- Linked technology discussions to the participants' individual needs;
- Worked to build personal rapport more quickly between the Institute Facilitators and Fellows.

Physical and social learning environments

In addition to planning the course content, flow, and learning activities for adult learners, and to be fully effective, instructors of adults must also plan for the physical learning space and consider their own behaviors within the classroom to ensure that these elements supporting adult learning are in proper alignment.

Several studies have reported that communication between instructors and learners and among learners is adversely affected by the negative feelings they experience as a result of inhospitable learning environments. German studies in the 1970s found evidence that physical environments impact both human perception and human behavior. The term “office landscape” was coined to describe features of the built space that can either facilitate or hinder the ultimate purpose of that space. The same concept can be applied to “learning landscapes”.

In the early 1990s, Roger Fulton commented on the lack of critical research on learning and physical environments and observed that instructors are frequently unaware of the possible value or harm to learning caused by the characteristics of the physical spaces in which learning is meant to occur. He also noted the absence of model that explored the relationships of physical environments to learning. In response, Fulton developed the SPACIAL model to integrate the findings from a wide range of disciplines studying the impact of space on human psychology, aesthetics, social psychology, human factors engineering, and architecture. The SPATIAL model hypothesizes that learners’ satisfaction, participation, and achievement within instructional settings are all affected by their individual perceptions of the learning space, that learners’ perception of space are subjective, and that the positioning of the instructor within the classroom and the layout of the room itself are modifiable. It suggests that physical environment is but one tool in the educator’s toolbox that can be manipulated to better support instructional design, encourage discussion and facilitate other learning activities that are important to adult learners. While the SPACIAL model acknowledges that there is no perfect physical environment that meets all learners preferences, physical space can still impact learners’ participation in coursework and their satisfaction with the learning experience. Since interactivity is frequently a crucial factor in adult learning, special attention

must be paid to room arrangements that support interactivity. Environments with adjustable furniture afford learners more self-determination and customization; both are qualities that they seek in learning. While the traditional rectangular classroom with a lecturer's podium situated at the front of the room reflects an authoritarian or institutionalized learning environment, moveable furniture, rounded seating arrangements, and face-to-face site lines all support the active and social learning that are preferred by adult learners.

In *Creating Environments for Effective Adult Learning*, Rodney D. Fulton and Richard S. Vosko include the following types questions for instructors' consideration as they perform diagnostics on a classroom's features and suitability:

- What messages about learning are suggested by the conditions of the space?
- Is the space well lit and comfortable? Does the noise level accommodate listening and talking? Can you control for heating, air conditioning, and ventilation?
- Is the space arranged in such a way as to support the planned for learning activities?
- Have distractions and barriers been mitigated? Are there clear site lines for everyone in the room?
- Can learners take charge of learning spaces and make changes to meet their preferences?
- Do learners appear to be uncomfortable, distracted, or anxious to leave? Have they been asked whether they are comfortable?
- Does the space provide the necessary equipment to support planned learning activities?
- Have accommodations been made for special needs of the learners?
- Can learners easily find their way to the instruction room?

Beyond the physical learning environment, social learning theorists describe the adult educator as more than a mere dispenser of knowledge. For them, the adult educator is one who -- beyond the physical learning environment -- strives to create a social learning environment that projects encouragement and inclusiveness and adopts the qualities of a facilitator rather than an expert. This plays out in the respect they afford the learner's experience, needs, opinions, and feelings, in their recognition of how the learning

experience is being perceived by the learner (enhanced by administering mid-course evaluations, taking corrective action, and following up with post-course evaluations), and by presenting themselves to the learner in a genuine way.

Climate setting is a crucial activity to be addressed at the beginning of a course involving adult learners. It is here that the instructor can allay any anxieties that adult learners might bring to the classroom. It is generally recommended that during the initial class meeting that the instructor demonstrates the course's value by addressing how it will meet learner-defined problems and needs and contribute to the learners overall effectiveness. At the same time, the instructor should provide an overview of the course and seek learners' reactions to it. The instructor can make clear that (s)he and the learners share responsibility for defining course goals and activities and that learners are encouraged to express themselves freely and contribute to decision making affecting the course, thus fulfilling the adult learner's desire for self-direction. So too, it is generally recommended that the instructor reinforce that learners are encouraged to share their experience with the course topics, and that individual opinions and personalities will be respected. In these ways, a relationship is established where all members of the class, including the instructor, are co-learners, and where the "instructor" role is shared by all.

Burton R. Sisco, in *Creating Environments for Effective Adult Learning* suggests instructors consider questions similar to the following in this regard:

- Why might learners want to take this course? How can I ascertain their personal learning goals?
- How can I relate/customize the learning experience to participants' unique needs and experience?
- How are learners in the class either alike or dissimilar from one another and how might this affect discussions and sharing? What steps might I take to mitigate this?
- How can I make learners feel welcomed, at ease and comfortable with shared planning and participation in the course?
- What can I reasonably expect from learners in terms of commitment to completing work outside of the classroom?
- How much time should I allot to hands-on practice and personal application of course concepts, theories, and information?

- What can I say or do to convey my genuineness and commitment to the learners?

Practical implications of andragogy

In concluding, I would like to share what I consider to be some of the practical implications of an andragogical approach to planning the learning experiences of advanced user's.

IF … adult learners view learning from a problem-centered orientation …
THEN …

- The Instructor needs to clearly understand how advanced users are identifying and framing the problems they wish to have addressed through the learning experience and what their individual goals and challenges are.
- The learning experience needs to be designed around these learners' identified problems and questions rather than focused on the instructor's content knowledge.
- The instructor must set the scene for learning by explicitly stating how the course and individual exercises and assignments have been designed to directly address the learners' needs.

IF … adult learners' readiness to learn is determined by their need to know or master something that will contribute their effective performance …
THEN … Instructors should …

- make connections between the information and activities shared within the course or workshop and their direct contribute to the effective performance of learners over time
- arrange for other advanced users who have already applied the lessons of the course to share how this has contribution to their effectiveness
- build in reflective exercises for the advanced users that will allow them to surface this information themselves

IF … the best adult learning is interactive learning …
THEN … Instructors should …

- arrange the learning space to maximize discussion and hands-on work
- encourage discussion and draw learners into the learning community with questions not lectures

- incorporate a variety of individual and group activities within the course and allow sufficient time for participants to apply what they have learned to their individual circumstances
- provide individualized feedback from the instructor and from the learners' peers

IF … adult learners come with extensive experience upon which to build …
THEN … Instructors should …

- design exercises to elicit relevant experiences that might inform the advanced learners' learning
- think about interactive exercises that will cause the participants to reflect on past relevant experience
- listen carefully and make connections between the adult learners' previous experiences and the course content

IF … being self-directed is critical to the adult learners' self-concept …
THEN …

- Instructors will need to adopt the role of facilitator in the classroom.
- The power of determining the direction the course will take must be shared between the instructor and the participants.
- Offering a choice of learning activities should be considered.
- The instructor should remain flexible and adaptable to suggestions for changing the course plan and activities that are offered by the participants.

For more information on the Mellon Library Faculty Fellowship for Undergraduate Research, please consult the web site http://www.lib.berkeley.edu/mellon/.

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