

# International Journal of Self-Directed Learning

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# International Journal of Self-Directed Learning

# Volume 2, Number 1, Spring 2005

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# Preface

"Today, the most important skill is learning how to learn." With this comment, Thomas Friedman, author of the 2005 best-seller *The World Is Flat*, echoed the wisdom of decades of educators committed to the importance of developing lifelong learners. Malcolm Knowles declared in 1975,

The "why" of self-directed learning is survival—your own survival as an individual, and also the survival of the human race. Clearly, we are not talking here about something that would be nice or desirable....We are talking about a basic human competence—the ability to learn on one's own—that has suddenly become a prerequisite for living in this new world. (pp. 16-17)

Thirty years later, in a world of unprecedented proliferation of information and technology, instant worldwide communications, and intense global competition, lifelong self-directed learning is now, more than ever, a necessity for survival.

This issue begins with two articles that document the outcomes of efforts to incorporate facilitation of self-directed learning into preparation programs for those who teach others on opposite sides of the globe. One, based in a university in the United States, presents an innovative community learning partnership with a hospital. The other, based in a teacher training institution in Hong Kong, examines an effort to enhance the capacity for self-directed learning in student teachers.

These articles are followed by an examination of age and gender differences in self-directed learning and a report of the development and field-testing of instrumentation to assess the relationship of self-efficacy in learner autonomy and autonomous learning. A preliminary analysis of learner autonomy in online and face-to face settings explores the important area of distance education in an institution offering primarily graduate instruction, most of it online. The final article reports on an exploration of barriers, interrupters, and restarters in the learning projects of highly self-directed adult learners, using a modified version of Tough's interview schedule to explore topics not examined in previous versions.

In a flat world, Friedman points out, the individual worker is going to become more and more responsible for managing his or her own career, risks and economic security; therefore, the job of government and business is to help workers build the necessary muscles to do that. We would add that individuals are being expected to take on more responsibility in all aspects of their lives, and the job of educators is to incorporate the development of the attitudes and skills supporting self-directed lifelong learning as a central aim of education. To do less is to compromise the ability of tomorrow's workers and citizens to function effectively in a world we cannot even predict.

This journal represents an ongoing effort to promote research and reflective practice in selfdirected learning. We hope you find it helpful.

Huey B. Long and Lucy Madsen Guglielmino, Co-editors

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# **BREAKING THE INSTITUTIONAL MOLD: BLENDED INSTRUCTION, SELF-DIRECTION, AND MULTI-LEVEL ADULT EDUCATION**

Naomi Boyer and Maxine Kelly

# ABSTRACT

Educational programs for adults tend to be broadly focused on skill deficiencies rather than on comprehensive development to create systemic transformation and to increase organizational effectiveness. Conversely, the "Learning, Relationships, Mentoring, and Communication" (LRMC) Certificate Program aimed to alter both the hospital in which the program was implemented and the framework that traditionally determines University protocol. Partnership, innovation, and the replication of best-practice were the tools with which LRMC sought to transform individual, collective and organizational learning. This qualitative, design-based research addresses three outcomes of the pilot program implementation: student satisfaction, the extent to which organizational expectations were achieved and the success of multi-level learning experiences. The research design utilized multiple data sources and analysis by two researchers using qualitative techniques. Even at this initial stage, success has been recorded in all three areas, suggestive of the need to extend this service to other agencies.

As the demand for interdisciplinary, community-based collaboration and partnership invades the higher education spectrum, the conflict between established institutional structure and creative design intensifies. Requests for proposals from funding agencies at national, state, local and foundation levels have begun to place value on initiatives and research that demonstrate multidisciplinary perspectives, cross-organizational dialogue, and an intrinsic community service agenda. In spite of this new focus, most higher education institutions remain departmentally myopic and tied to the design of programs that are steeped in theory-driven, compartmentalized instruction that is disjointed from the community and workplace reality.

Guidelines that monitor and preserve the academic integrity of higher education institutions provide that differentiate clear but often rigid structures program levels (undergraduate/graduate/post-graduate) for individual courses or programs based on admission requirements, contact hours, academic rigor and grades. Because these structures are aligned with accreditation or state specifications, they presented challenging hurdles in designing a program that addressed both the interdisciplinary interests and multiple educational levels of the participants.

Many national and international organizations have found pathways around these antiquated notions, creating learning experiences that bring value and relevance to the community and workplace. The partnership between Lakeland Regional Medical Center and the University of South Florida-Lakeland (USF-L) has designed a program to provide skills to clinical experts providing learning for their respective departments. A certificate program titled, "Learning, Relationships, Mentoring, and Communication" (LRMC) has been created through a design, implementation and improvement process.

# PURPOSE

The purpose of this study is to examine the challenges and successes of the *Learning*, *Relationships*, *Mentoring*, *and Communication* (*LRMC*) program through three research questions:

- 1. How satisfied were students with a blended learning framework comprised of online, face-to-face and self-generated content delivery mediums for continuing their professional learning experiences?
- 2. Did the social, self-directed framework, inclusive of learning contracts and reflective instruments, provide appropriate learning documentation that satisfied both higher education and external organization expectations?
- 3. What were the resulting dynamics of including adult learners at varying stages of educational development (High School, Bachelor's, Masters and Doctoral Diplomas) in the comprehensive experience?

Adequately explored, these questions can document the outcomes of one approach to seeking University innovation and new partnership alliances which may serve as a useful resource for others. Broad generalization of results to other situations and settings is, however, not possible, due to the single-sample setting.

# SETTING

The Lakeland Regional Medical Center (LRMC) is a fully accredited (Joint Commission on Accreditation of Healthcare Organizations) 851-bed short-term hospital. This not-for-profit facility has served Lakeland and the surrounding communities with a wide scope of specialized medical services for more than 80 years. Although the hospital does not have any current medical school affiliation, its more than 2,000 professional and support employees offer significant contributions to the health and well-being of the community through a variety of community outreach, support and education programs. This culture of learning demands that hospital employees at all levels remain abreast of innovative treatments and technologies in order to effectively perform their service and teaching responsibilities. In an effort to enhance the instructional skills of departmental experts responsible for education, the hospital approached the University to collaborate on the design and implementation of a program that would have the structural underpinnings of accredited and recognizable higher education coursework with the flexibility and specificity of skill demanded in the hospital setting.

With its 17-year history of developing innovative community-centered educational programs USF-L was ideally framed for partnership with LRMC. Located 30 miles east of Tampa and 40 miles west of Orlando, USF-L is at the heart of the emerging Florida High Tech Corridor, and ideally placed to provide innovative need-driven learning experiences that are relevant to the intellectual and technologically advanced needs of today's workforce. Most of these community-anchored programs are portable, technology-enhanced, and delivered in settings and modes that are not traditional to higher education. In addition to developing coursework or programs based on community needs, the university actively serves over 2000 students with course offerings for more than 20 complete undergraduate and graduate degrees, granting degrees through the

Colleges of Arts and Sciences, Business, Education, Engineering, Information Technology and Nursing. It is ranked among the top 100 research universities in the United States and conducts independent and collaborative community-focused research in four counties (Polk, Highlands, Hardee and eastern Hillsborough). USF-L's profile and history provided the framework for partnership with LRMC and the consequent development of a program that would enhance the instructional skills of departmental experts in the hospital's education division.

# PROGRAM DESIGN

It was imperative to LRMC that the learning opportunities provided to their employees be of high academic quality, practical and flexible enough to accommodate the hospital work schedules and adult life styles. Accordingly, the program evolved collaboratively as the clinical expertise of LRMC staff from nursing, business, information systems and patient services was infused with concepts and principles of adult education. The program planning committee included core representatives from the Hospital (Vice-President of Family Wellness Center, Director of Hospital Education, Manager of Education) and the University (Associate Vice-President of Academic Affairs, Director of Distance Programs-Instructional Technology, Director of Marketing, Director of Community Research-Interdisciplinary Social Sciences/ Nursing, Chair of Communications, Chair of Adult Education, Dean Undergraduate Studies, Public Health) to ensure that the program addressed needs of both organizations.

Clearly, the program needed to be flexible, adaptive, challenging, relevant and practical to meet the needs of the LRMC learner. Essentially, learners had to be adept at "thinking on their feet," a concept strongly reflected in Problem-Based Learning (PBL) theories (Woods, 1991). According to Woods, learning prompted by the need to solve a problem is stored in memory patterns that are easier to recall and use so that knowledge segues to application--a core requirement for LRMC learners. In PBL, problems then become the stimulus and focus for student activity (Boud & Feletti, 1991). Although no longer peculiar to the medical field, PBL was first introduced at McMaster Medical School in the 1960s as a learning environment that combined small group, cooperative, self-directed interdependent, self-assessed problem solving that generated true transferable learning.

The primary problem experienced by the team in developing the proposed certificate program centered on aligning the hospital's needs/desires with university standards while retaining sensitivity to participant needs. Since radical change was not an option, it was essential to consider the needs and limitations of everyone involved in the partnership in order to create a program that would meet this array of expectations.

Adult learning theories of self-direction and andragogy establish the boundaries for exploration of the above described theories in the context of adult learning. Thus outlined, the socio-cultural emphasis is minimized without considering the learning process of the proposed research population. Self-directed learning has been defined 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" (Knowles, 1975, p. 18). The adult learning concept of andragogy includes key components of: interaction, task centeredness, individualization and self-directedness (Knowles, 1986). These components

are applicable to transformational adult learning regardless of the learning setting or instructional delivery method (Lane, 1997).

Knowles (1986) has suggested that adults have a deep psychological need to be self-directional, and designing educational programs toward this end increases ownership of the learning experience. Evidence suggests that when adults learn on their own initiative they learn more deeply and permanently than what they learn by being taught (Knowles, 1986). Students who become empowered to control their own learning experience become transformed as individuals and therefore more engaged in their own learning process (Moore & Kearsley, 1996; Lane, 1997; Palloff & Pratt, 1999).

While self-direction has been considered a function of independent learning, the blending of selfdirection with the aforementioned theories merges the concept of the individual with the collective, providing certain strategies and techniques that can be used for instructional practice. Traveling from an individual self-direction toward a concept of social, self-direction provides all of the value of active, constructed cognition as well as shared vision, language, and objectives. White and Weight (2000) note, "Working adults may be self-directed, but they also value the exchange of ideas and meaningful relations" (p. 43). These same meaningful relationships may also lead to deep knowledge construction with outcomes that far outweigh traditional instructional methods.

Thus collectively, theories on adult learning and problem-based learning were used to construct the pathway to valued and relevant learning for the LRMC project. The following concepts were included in the proposed program: (a) analyzing/determining educational needs, (b) designing education programs/differentiated teaching methodologies, (c) producing educational programs/interventions, (d) implementing educational programs, (e) evaluating educational programs, (f) communicating effectively (skills and concepts for leaders), (g) mentoring, coaching and supervision practices, (h) assessing educational programs, (i) teaching skills, (j) working on education teamwork, and (k) using technologies to enhance instruction. The resulting product was a blend of learning experiences rich with relevance for the LRMC employee. It was packaged to retain flexibility, featured smooth delivery and could be readily assimilated by the adult learner.

Working with adult learners in a format that addresses organizational demands, yet facilitates the successful learning of the individual poses interesting questions and options. One key element to this partnership that proved to add yet another dimension to this emergent program was the participants themselves. Employees selected for participation in this program were released from duty for face to face classes, but were expected to comply with established work protocol, readings, assignments, and online interaction. As with most adults, normal life routines, family demands, and health issues contributed additional stressors.

# PROGRAM IMPLEMENTATION

At the end of a year of planning and reflecting and designing, the "*Learning, Relationships, Mentoring and Communications*" (LRMC) certificate program was ready to be piloted. The hospital committed to pay all appropriate tuition, university fees, and texts. The LRMC program is comprised of 20 credit hours at the appropriate instructional level (undergraduate/graduate) and includes classes from the following departments or colleges: communications, adult education, interdisciplinary social sciences. Content from leadership and instructional technology is also integrated into the courses. There are five faculty members who teach in the program and a program coordinator who monitors the progress. While the duration of the certificate program is eighteen months, this particular study is focused on the first semester and the experiences derived at this time, and has both formative and summative value.

The instructional format was flexible and emerged as the program structure developed. Students enroll in two classes for the first semester and in one course in subsequent semesters, until the final semester, when they again enroll in two simultaneous courses. The courses on which this research is based are "Communicating Leadership" and "Integrative Learning Strategies." The latter class involved learning contract strategies, self-directed learning tenets, and basic instructional technology components.

Students in both classes were required to complete individual learning contracts to highlight specific areas of knowledge acquisition. A group-program learning contract was required of all participants that addressed the global objectives of the program. Students are expected to work on this global contract throughout the eighteen months of the program, culminating in the delivery of an evidential product to a self-selected team of University and Hospital personnel.

The format of each class was left to instructor needs and was selected based on content. The first two classes involved both face-to-face and online experiences. Face-to-face meetings for one of the courses, involved a full day five-hour session (from 9:00-2:00), which met six times during the semester, with additional feedback and assignment submission online. The other course met for two full days (9:00-2:00) at the beginning of the semester, with optional workshops available (2:15-4:15), five times during the semester, and a final half-day (9:00-12:00) session for sharing learning. Online dialogue, assignment submission, content, and feedback were facilitated through e-mail, discussion boards, content organizers (courseware tool), student homepages, and announcements. Blackboard (6.0) was used as the courseware tool for all course development. Participants were encouraged to log on at least three times a week to participate in online activities. Classes were held at either the university or the hospital, depending on the availability of space and technology equipment.

The instructional distinction was made between graduate and undergraduate students through the appropriate readings, assignments, and level of work identified on learning contracts. Graduate students were expected to complete additional presentations and readings with evidential products established at a higher level. Mentorship was available to students to maximize learning potential, but also reduce the anxiety of working in a class with peers from multiple educational levels.

# **RESEARCH DESIGN**

The research design for this project was qualitative; however, a design-based research protocol for global model building has been followed. The instructional design for the LRMC program was based on a model of social, self-directed learning, which involved a complex and dynamic systems approach that is represented by the formula (*Input + Process + Output= Outcomes* (I+P+O = Oc). (See Figure 1.) Such a model is appropriate to explore within the design-based research method (Sloane & Gorard, 2003). Of particular interest in this study was the transferability of this model to a program setting versus a course design.

Quality design-based research includes five main characteristics: 1) learning environments and "prototheories" are intertwined, 2) continuous cycles of design, enactment, analysis, and redesign occur, 3) the development of "sharable" theories that are relevant to both practitioners and other researchers is sought, 4) designs are useful in authentic settings, and 5) documentation provides an audit trail that "connects processes of enactment to outcomes of interest" (The Design Based Research Collective, 2003, p. 5). Thus all data collection activities for this study were embedded directly in the instructional design, thereby ensuring that reflections were an integral part of academic knowledge-building.



Figure 1. Model of Social Self-Direction

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Cobb, Confrey, diSessa, Lehrer, and Schauble (2003) explain, "Design experiments therefore constitute a means of addressing the complexity that is a hallmark of educational settings" (p. 9). Despite the flexibility of this research method, design-based research provides a protocol and standard for conducting interdisciplinary, team-based, practitioner/scholar, mixed method, and iterative type projects to frame and focus the inquiry.

While this study was part of meta-theory development and model design, the research questions focused on the appropriateness of model features in diverse environments. Expanding model usage to a full partnership program, involving multiple instructors within a health care environment, and including blended (online and face-to-face) environments were all new iterations of model adaptation. Only the data from first semester (two courses) in the program were used to investigate the research questions. All data collected were reviewed by two researchers to improve research validity.

Triangulation has been defined as the use of multiple investigators, multiple sources of data, and/or multiple methods (Gall, Borg, & Gall, 1996; Merriam, 1988). The use of triangulation in qualitative research improves overall internal validity. Therefore, the use of two researchers who will both code multiple sources of data (transcripts, e-mails, reflection contracts, online discussion rating forms) and the use of design-based research inclusive of multiple methods and studies, greatly improves the validity of this study.

# Sample/Population

The 26 program participants all work at the Lakeland Regional Medical Center an 851-bed health institution located in Lakeland, Florida. The participants have varying levels of educational achievement: high school diploma, AA, AS, bachelor, master and doctoral degrees. There are 9 undergraduate students and 17 graduate students. The group is comprised of those with high clinical expertise such as pharmacists, nurses and information technology specialists who are involved in the practice of educating others within their units on a variety of topics (See Table 1). The majority of these participants still perform active clinical work as well as educational duties. There are 25 females and 1 male. Their ages range from 26-64. Some are involved in other formal coursework at various universities while others have not been involved in formalized education for over 30 years. A large range of technology skill and training was represented.

Participants were selected by the hospital education administrators and were required to participate as part of the professional development activities instituted for continued employment. These hospital educators continued clinical rounds, despite educator status. At the outset, all students were enrolled as non-degree seeking students. An option was given for all program credits to be applied to two master's degree programs (Communications and Adult Education). Undergraduate students would need to deal directly with advisors to determine if credits could be applied to the various areas of interest. Other master's programs may also accept credits, but it is likely that not all credits would be applicable. Certificates would be offered at both the graduate and undergraduate levels from the University and would satisfy employer's continuing education requirements for some of the participants.

		Deg	gree Level			
Hospital Department	High School	Associate Degree	Bachelors	Masters	Doctorate	Department Total
Emergency Room (Nurse)		1				1
Respiratory Therapy		1				1
Instructional Technology			1	1		2
Pediatrics (Nurse)			2			2
Surgical/Operating (Nurse)			2	1		3
Pharmacist					1	1
Education (general)	1	2				3
Nurse Education Programs			1	1		2
Physical Therapy			1			1
Financial Service	1	1				2
Clinical Nurse				2		2
Obstetrics (Nurse)			1	1		2
Medical Cardiology		2	1			3
Information Services			1			1
Degree Level Total	2	7	10	6	1	26
Under	graduate	9		Graduate	17	

<i>Table 1.</i> Education Level and Clinical Expertise of Sample Grou	Table	21.	Education	Level	and	Clinical	Expertise	of San	ple	Grou
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# Data Collection

In order to study the three research questions outlined above, online discussion transcripts, course evaluation (researcher designed), evidential product review, course grades, and learning contracts/reflective instruments were reviewed. Students have also had the Learning Combination Inventory (LCI) administered as part of ongoing coursework as a means of defining learning patterns. Each of these instruments will be described further below.

# Online Discussion Transcripts/E-mail Reflections

Three main reflection questions were given to students in two formats. First, an e-mail was sent to students after the two face-to-face meetings of the "Integrative Learning Strategies" course to garner initial feedback. The orientation feedback question was: "What did you learn about yourself as a learner during the orientation and how will you apply it in your approach to this course/program? Do you anticipate using this information with others in your work setting or to arrange your instructional content?"

Two personal update questions were asked on the asynchronous discussion board, one at the mid-point during the semester and one at the end of the semester. All responses in the discussion room were visible to all group members. Participants were asked to hit reply to respond to the two postings questions below:

It is time for everyone to check in and tell me what you are working on individually and as a group. Since we have all of the learning contracts in with agreement, that tells me that you should all be moving forward on objective completion. So....please hit reply and give me a rundown on what you are working on, what you need further support on, and how you gauge your learning thus far. Looking forward to hearing from all of you.

As we approach the end, I would like to hear from EVERYONE on how things are wrapping up for you. At this point I think it is safe (because I think you now have sufficient information) to ask the following questions:

- 1. What did you learn in this class? (Keep in mind that your answers do not only have to be about technology issues.)
- 2. Did your work in this class have an impact in your surrounding settings (your hospital department, other departments)? Please specify where and how you find yourself using your knowledge and skills.
- 3. Describe how you did or did not use the information about your learning patterns (LCI) as you worked throughout the semester.

The transcripts from each of these questions (both on e-mail and discussion room forum) were compiled and analyzed for themes. All coding was completed by two separate researchers and then compared for themes. The following codes were used to structure the analysis of these open-ended questions: participant satisfaction (environment and structure), learning achieved, noted differences in educational level.

# Course Evaluation

Designed by the instructor, the course evaluation was completed by participants to rate course effectiveness, satisfaction, relevance, instructor feedback and online impressions. This evaluation included 10 Likert scale type questions and 5 open-ended questions. These evaluations were e-mailed directly to the instructor. Information from the open-ended questions was then coded along the same coding schematic listed above. General descriptive statistics were also generated from the rated questions. Traditional university required course evaluations were also administered; however, the data from these instruments were limited due to the nature of the questions and the low online responsiveness.

# Learning Contracts

The completed learning contracts (both individual and global) for each course was used as an indicator of differences in graduate versus undergraduate work. Documentation of completed learning contract products was assembled in portfolio format and available for review. Document analysis was completed to determine whether the learning contracts related to satisfaction levels and overall learning.

# Evidential Products

The products that accompanied completion of the learning contract provided rich data on the overall learning that was achieved. These products document the authentic experience of the participant and indicate a level of relevance to work activities.

# Reflection Contract

Students were asked to rate their own level of work accomplishment and evaluate objective completion on this form. Students assigned themselves grades and listed comments. This document was coded for the themes previously presented.

### Online Discussion Rating Form

This form provides the opportunity for participants to reflect on the online interaction throughout the semester. Information from this form provided data on satisfaction of online environment and activities.

### Course Grades

Grades accompany all course completion activities and also serve as an output data source of documented learning. These grades, while minimally significant, do provide an indication of success at the various educational levels (undergraduate and graduate).

### Correspondence

Throughout the semester, students often e-mailed the instructor with feedback, concerns, and impressions. These reflective e-mails were coded much the same way as the discussion room and reflection statements.

### Assumptions and Limitations

There were a set of assumptions that guided the designed program and the presented research. First, the role of the regional university was to respond to expressed community needs. This was to include collaboration and development with area businesses, agencies, and organizations. Secondly, the experiences in the first semester were studied as a representation of the program and the expectation was that future semesters would support the foundation that was established in the initial stages of the program. Finally, level of impact of the program on the medical institution was assumed be accepted, encouraged, and warranted. The basic understanding was that the hospital would support growth, empowerment, and burgeoning leadership.

The small number of participants and initial phase of the program serve as a limitation of the research. Despite the assumptions described above, each could be seen as minimizing the conclusions of this research. Time, further application, and continual cross-organizational communication would be necessary to sustain the findings of this study. The inter-institutional, ongoing work routines also contributed to programmatic developments that were not anticipated at outset. Participants, in some cases, saw other participants on a daily basis and/or had access within the normal operating channels, thereby altering the impact of the program, and satisfaction with delivery mediums.

# FINDINGS

The data are reviewed by using each of the research questions as a schema for discussion. The instruments and open-ended questions utilized for data collection are interdependent; thus, the sharing of these results is based upon segments of the analyzed data as it relates to the three stated research questions.

# Research Question 1: Student Satisfaction

How satisfied were students with a blended learning framework comprised of online, face-to-face and self-generated content delivery mediums for continuing their professional learning experiences?

### Blended Framework

The online portion of the course was well received as a resource by most students, but not necessarily as a means of communication. Many of the students indicated that the discussion boards were time consuming and frustrating since they worked directly with one another and frequently had physical contact. The format of the discussion board, an open communication environment for planning, sharing, and posting of website resources, was not embraced by all participants but was fully embraced by others.

The online portion of the program appeared to support the technology growth of some participants by spurring them to attempt additional tasks using online tools and Internet skills. See one participant's response below (taken from the Online Discussion Rating Form):

I enjoyed the different perspectives everyone gave, it kept my juices flowing. The more often I went online the more comfortable I became with the Internet and the function of the Blackboard communications.

It is a great way to have a class and also to communicate with colleagues.

On the other hand, other participants were quite expressive on the Course Evaluations and Online Discussion Rating Form about their discomfort and frustration with these tools. For instance:

I don't think there was a lot of value to the discussions. It seemed like most people were typing a response just to type one. There wasn't a lot of value in it.

There is way too much information to go through. I think email is more beneficial. Did not like going through EVERYONE's comments. Took way too much time.

Some students preferred the face-to-face portions of the program due to the ability to actively engage with others without having to self-regulate personal activity (such as logging on, managing time, and completing projects). They also felt face-to-face communication was convenient because all of these individuals worked together; making it was easier to get together on an informal basis. Also, a factor that emerged was that since students were attending face-toface portions during their working hours, they did not resent the time (travel, class time, and activities) to the extent that a more traditional student might. By contrast, the work and online portions of the class required that they find their own personal time to complete tasks rather than participate during work time.

### Self-directed Learning

Student comments on the Online Discussion Rating Forms, Course Evaluations, and Final Reflections indicate that students appreciated the online resources and the ability to search for resources themselves, while also seeking further structure in optional in-seat workshops (provided upon student request). The following themes (and examples of supportive statements) were generated from these comments and reflective statements:

# The self-directed framework challenged participants to step beyond comfort zones into tasks that generated further competence and self-confidence.

While my former managers...introduced me to the use of the learning contract, I now feel more comfortable in their design and use. I do think they are a bit easier when there are defined objectives and even guidance in how to achieve the objectives (such as the posted technology resources...).

I am learning to detour now, rules can bend a little and taking a chance once in a while won't kill me....so you see, I am more confident in myself and I appreciate and respect the differences that we all have.

# The experiences appeared to create an environment where students could visualize an expanded career expectation and personal role extension.

I also like my work group because we each bring such complimentary [sic] traits to the work table. Our objective addresses needs in each of our areas of expertise; and I think the final outcome will make a difference in the institution.

As I outline my work for the projects that I'm involved with, it seems to flow more easily now that I have the resources and skills to find the necessary information.

Continuity between courses, content and real life allowed the generalization of knowledge to occur in a seamless fashion. This theme does not have any direct quotations from reflected materials included; however, this theme was generated from the responses and comments that wove between the two classes that were offered; the learning contracts, final products, and presentations showed a merging of content.

Overall, students appeared satisfied with the self-directed framework of the classes and enjoyed the facilitative role between the instructors and participants. Despite the appreciation of the self-directed frameworks and provision for self-exploration, there appeared to be a lingering desire for additional traditional instruction. This phenomenon can most likely be attributed to continued lack of confidence, fear, and uncertainty that has been found to coincide with transformational learning experiences.

# Research Question 2: Organizational Satisfaction with Learning Outcomes

Did the social, self-directed framework, inclusive of learning contracts and reflective instruments, provide appropriate learning documentation that satisfied both higher education and external organization expectations?

### Learning Documentation

Learning demonstrations on final self-identified products, self-perceptions (Final Reflective Updates), and final presentations were very indicative of a learning process that extended beyond superficial levels to internalized skills and analysis. Themes that emerged from the coding are indicated in italics.

An attachment and linkage to real, workplace projects and life change was indicated. The majority of participants completed products that met an assigned task within their jobs, using greater technology skills and an expanded awareness of communication. Products included some of the following: Newsletters for sharing of departmental items, PowerPoint presentations for training, orientation, and intra/inter-organizational sharing, spreadsheets for clinical purposes, PDA usage on the clinical floor, communication tools for sharing of resources. Participants reported increased efficiency, effectiveness, and professionalism. Further validity is indicated by the feedback received from others who were the recipients of the delivered service or product. One participant writes:

I learned way too much to express on paper. I am doing things I never thought possible. My children are amazed at my new skills as well. In the past I had to go to them for help with projects that involved the computer, now they stand back in awe as I put out these wonderful works of art.

The knowledge that was gained went beyond facts and figures to allow participants to reach farther, produce more, and gain confidence to try additional tasks.

New knowledge was being shared with others and participants expressed the ability to teach the accomplished objectives. Some participants expressed their learning in terms of their ability to teach others their newly learned technology skills. A web-site club was shared with another institution. Software was being demonstrated to others on the periphery of this program. The grading contracts included multiple comments indicating that students were rating their gained knowledge based upon their ability to educate others about what they had learned.

*Self-analysis and metacognition of learning increased throughout the process.* Both confidence and amazement were expressed in the final reflections that had participants delving into abilities, beliefs, and thinking beyond the completion of assignments. Student comments suggest increased confidence, learning new ways of accomplishing tasks and learning, and intentionally adjusted behaviors to adapt with others. There is a sense of the learning process that has become exciting and possible as indicated by the following statements:

Learning is invigorating! The more I learn the more I want to learn. I just want to be a sponge and soak it up.

The work in class has improved my monthly resident newsletter that I give to our new nurses. My flyer for our upcoming seminar has improved to the one that I developed four months ago.

Issues such as time management skills, personal responsibility and awareness of risk were threaded throughout all of the instruments that called for reflection. Learning comments mirrored the developmental process by expressing initial fear, trepidation and reservation and eventually confidence, competence and ability.

A greater sense of community and collective appreciation for talents and abilities of others emerged. One of the most interesting learning themes that emerged from the various data sources was the resulting group cohesion, social empathy, and respect. For these participants, some who had worked in this department for an extended time, there was a sense of interpersonal knowing that resulted from the experience. Comments indicated pride, amazement, and talents that would be further utilized as both class work and works tasks continued. The participants appeared to relish the chance to get to know the strengths and weaknesses of others and to diminish the barriers that were previously keeping these individuals from bonding as a synergistic group.

Wow! We sure have learned a lot! My learning outcomes are very similar to everyone who has responded already, but I think that the highlights for me have been the bonding and learning about each other in our team.

Impact, a point where personal learning and real world collide to create physical changes and direct reflection on others and the organization, was reported for the majority of these participants. This theme threaded the participant comments and reflections on the level of learning and the relationship of this learning directly back to their institution.

As a direct result of this program, I've had to become more organized everywhere. I've carried this not only to my school work and job role at LRMC but also to my home life. I am going room to room giving everything a spot.

We used our presentation from class (with some modifications) for a presentation to 7 area hospitals yesterday on the critical care orientation program....was filled with "oohs and aaaahhs" with the hyperlink and being able to access the program on the screen for the entire class to view! We had also hyperlinked a web site of EKG information....they loved it!

The course(s) by all means were meaningful. I feel a lot more comfortable with my computer skills, which has enabled me to get my work done in a timely manner. [The communication class] has me thinking outside the box more and only confirmed my beliefs on how important it is for communication between all parties involved.

The university expectation of appropriate contact hours, academic rigor, and successful completion of courses was achieved throughout the semester. Faculty involved in teaching during the semester expressed satisfaction with work products and overall student learning. All grades were B or higher and all students successfully completed the semester.

The hospital was also pleased with the learning that was surfacing throughout all work tasks. They were pleased with the level of challenge and impact of the experience on the organization. Some concerns were expressed with time commitments, the need to adjust cohort membership to include newly hired individuals, and new technologies that were being requested as a direct result of the content. This last issue is a propelling agent for institutional change, but requires substantial funds to accommodate new equipment requests, software licensure, and hospital community buy-in. Participants had also approached the hospital about additional training for management in the concepts that were broached in the "Communicating Leadership" course.

Research Question 3: Impact of Mixed Educational Levels

What were the resulting dynamics of including adult learners at varying stages of educational development (High School, Bachelor's, Masters and Doctoral Diplomas) in the comprehensive experience?

This question was the hardest to adequately support with data shared by the participants because in most cases the mixed educational levels were not an issue at all. Student fear at the outset of the project could be tied directly to the level of previous educational experience; however, this did not diminish the participation and active learning that took place as the courses progressed.

Any of the differences that were noted seemed to correlate with career stage rather than the formal education that had been experienced. Some of the participants who were closer to retirement were less apt to want to work as hard as was necessary to complete the assignments and readings. In one case, a student at the beginning of the semester contacted the instructor via e-mail to share fear at the pace, the assignments, and the technology. She wrote: "My educational preparation is not as extensive as some of my other classmates and perhaps this might be leading to my difficulties." By the end of the semester she shares a different view:

Where do I begin...From novice to expert? Not exactly, but since I started the course I feel like an expert in some areas!....I know my skills have increased tremendously and have broadened my horizons....I can honestly say, I feel more comfortable.

The path from abject fear and panic to pride and confidence was at times a bumpy one. The lack of previous experience with higher education opportunities may indeed have influenced the beliefs and perceptions at the start of the program. Overall performance, however, was not lacking, based on instructor comments. This pattern appeared to be common to those who had been out of formal educational settings a longer period of time.

# CONCLUSIONS

There were not only themes that were noted within the questions, but general themes that ran through all three of the listed questions. These three themes linked all aspects of the program and provided the critical impetus to find ways to sustain and replicate program options with other institutions.

- 1. Participants' learning appeared transformed as a result of their participation in the program during the first semester.
- 2. Communication and technology skills were noted as being improved, both on an internal and external basis.
- *3.* Social structures developed that allowed for the institutional acknowledgement of new knowledge and personal appreciation of talents.

While these three items are positive, it is worth noting that all aspects of the program were not necessarily valued by the participants (i.e. online dimensions, work required, level of external commitment). Despite the less positive elements, meaningful growth and development was noted. Higher education is often touted as being disconnected from practical application and the real world, yet the impact of this program was found to be meaningful and relevant for the vast majority of participants. Evidential products demonstrated connectivity to workplace tasks by showcasing increased skills. Supervisors listed improved capacity and authentication of work products.

It could be said that the program participation began the process of transforming beliefs and perspectives for the majority of participants. Given that this research was conducted after the first semester, further investigation and evaluation is warranted; but participants underwent a journey which began at a point of mandatory participation, overwhelming feelings, and frustration and led to growing confidence, appreciation, and altered behaviors.

The flow and importance of communication was expressed repeatedly by the participants as they listed ways that they were enhancing the sharing of information through technological software and communication tools (e-mail newsletters, etc.). The skills were evidenced through the cohort as a result of the learning experiences of the first semester.

The social element was deemed vitally important to many of the participants, which can be said to have developed as a result of both the face-to-face meetings, the challenges and tribulation which unified participants, and the group formation for global program contract development. Participants were able to maximize work productivity, enhance role interdependence, and reduce perceptions that were previously intimidating. A great deal of respect was generated for others' expertise

What is in the future? Unfortunately, at the beginning of the second semester a few of the students who experienced the greatest fear at the beginning of the courses decided not to continue in the program. A few additional students were introduced to the cohort. The partnership has plans to offer this program to other medical institutions and organizations that might be interested in tailoring a program that can be aligned with organizational needs. Continued research is necessary to map and chart the progress and learning of the participants along with some longitudinal data to determine whether program components and outcomes were truly transformational.

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# DEVELOPING SELF-DIRECTED LEARNING IN STUDENT TEACHERS

Magdalena Mo Ching Mok and Ching Leung Lung

# ABSTRACT

This paper reports on the design and implementation of a project for developing self-directed learning in student teachers. The study involved 20 student teachers currently enrolled at The Hong Kong Institute of Education. The study contextualized self-directed learning in the Education Projects module. Each student teacher designed and implemented a small educational research project. The Know Want Learn (KWL) method, concept map and a reflection question were used to collect data on the change in the self-directed learning capacity of student teachers. Data analysis revealed that student teachers had differential growth in self-directed learning competence. Further, both quantitative and qualitative changes were observed in student teachers' conceptualizations of educational research. Nevertheless, capacity remained for further improvement in their capacity for self-directed learning.

This report is part of a larger study on the design and implementation of an intervention focused on developing self-directed learning in student teachers. This portion of the study focuses on phase one, a semester class. Since the end of the last century, many countries in the Asia Pacific region have initiated education reform (Townsend & Cheng, 1999) and, without exception, the capacity for self-directed learning was accorded top priority in the reform agendas (Mok & Cheng, 2002). A number of factors have contributed to the emphasis on self-directed learning in Asia Pacific countries, including developments in knowledge and information technology, new conceptions of the learning process, and economic crises experienced by the region in recent years. The rapid growth in knowledge implies that school education is no longer able to prepare our students adequately for the knowledge and skills expected of them in the workplace (Mok & Cheng, 2002). Instead, students must be assisted in developing positive attitudes toward continuous engagement in learning throughout life, and be equipped with the ability to learn for themselves.

Advancement in information technology has redefined learning, curriculum, pedagogy and the function of schools (Caldwell & Spinks, 1998; Cheng, 1999). Whereas in the past the teacher held the key to knowledge, with the current easy access to information through the Internet, the role of the teacher now is more of a facilitator who supports the learner's planning, exploration, judgment and organization of relevant materials in the learning pursuit. No longer is learning confined by the physical location of the learner. Instead, teaching and learning can take place anywhere where there is access to the Internet, at home, in school, in a library or café, or on a plane. The "basic skills" need to be redefined in light of these advancements. Delors (1998) identified learning to know, learning to live together, learning to be and learning to do, as the four pillars of education for the world to progress from an industrial age to a knowledge-driven world in the 21<sup>st</sup> century.

In addition to technological changes, there are also new developments in the conception of how people learn. Notably, in the constructivist paradigm, learning is viewed as an ongoing process

which positions the learner as actively interacting with new information and developing new cognitive structures to incorporate new information (Bruner, 1966; 1996). The notion that knowledge is being actively constructed by the learner necessitates self-directed learning. Bruner (1966) highlighted motivation to be the "best stimulus" to learning over and above such external rewards as grades or competitive advantage (p. 14).

Further, socio-economically, the impact of the economic crisis at the end of the last century and the aging population associated with low birthrates in many Asia-Pacific countries have confronted political leaders with many challenges. Many believe the solutions lie in the provision of quality education. There is evidence that engendering in students a positive commitment to lifelong learning and empowering them with competence for self-directed learning throughout life is imperative in the new century. The Organisation for Economic Co-operation and Development (OECD), an international organization helping governments tackle the economic, social, and governance challenges of a globalized economy, emphasized self-directed learning in the recent Programme for International Student Assessment (PISA) study (OECD, 2000) and reports the huge scale of resources allocated to the promotion of new conceptions of learning among teachers and students in major national systems. The G8 governments and members of the European Commission declared their commitment to lifelong learning at the 2000 Meeting (Chairman's Summary of G8 Education Ministers' Meeting and Forum, 2000).

# Teachers' Roles in Self-directed Learning

Despite the new initiatives to reform education worldwide, progress in their implementation has been slow. Even in countries like Japan and Korea, whose students outperformed their Western counterparts in international achievement surveys (e.g. TIMSS, 1996, 1997), concern was expressed about the growing levels of truancy and number of school drop-outs (OECD, 2000). Similarly, Hong Kong political leaders and social elites are far from complacent about young people's creativity, problem solving ability and capacity for self-learning. Several studies attributed the inadequate professional preparation of teachers as a possible cause and advocated for increased attention to the professional development of teachers (Darling-Hammond, Wise, & Klein 1999; Fullan, 1998; Futrell, 1994; Mok & Cheng, 2001; Sergiovani, 2000). That teachers play critical roles in the successful implementation of education reform is supported by such studies as the Holmes Group report Tomorrow's Teachers (Holmes Group, 1986) in the U.S., and the U.S. Carnegie Report A Nation Prepared: Teachers for the 21<sup>st</sup> Century (Carnegie Forum, 1986). There is also research evidence in the U.K., the U.S. and Hong Kong that unless teachers change the ways they teach, students cannot become effective learners (Black & Wiliam, 1998; Cheng, 1996; Fullan, 1996; Hopkins, 2000; Hopkins & Stern, 1996; Lieberman, 1995; Lieberman & Miller, 1999; Pipho, 2000).

Schrader-Naef (1999) undertook biographical interviews with 140 adults and compared those who engaged in lifelong education with those who did not. Schrader-Naef (1999) found that family background and teachers played an important role in developing self-directed lifelong learners. Those who came from good family backgrounds had better chances for quality education and to engage in subsequent lifelong learning. The Schrader-Naef study (1999) is particularly informative because it found that teachers tended to accept the family background of children as given and failed to encourage them to pursue more formal education. Schrader-Naef

(1999) reported that although many adults realized the inadequacy in their formal education, they revealed strong reluctance to engage in further education because of negative school experiences, low self-esteem and poor self-efficacy in the ability to learn. In all, research evidence supports the importance for teacher education programs to incorporate explicit components on self-directed learning of teachers.

Although the government in Hong Kong has placed 'learning to learn' as one of the key education reform initiatives, there is no explicit directive with regard to self-directed learning in teacher education programs. The current study is part of a larger study on the development of self-directed learning among student teachers across teaching programs at the Hong Kong Institute of Education. The aim of this study is to develop in student teachers the competence, including the attitudes, knowledge and strategies, for self-directed learning. Specifically, this study was guided by two related research questions:

- 1. Did the teaching module of Education Projects at The Hong Kong Institute of Education contribute to the development of self-directed learning in student teachers?
- 2. What were the changes in the capacity of student teachers to undertake independent systematic inquiry in education?

# The Context of This Study

The study was conducted in the Education Project module of the two-year Bachelor of Education (Primary) Degree at the Hong Kong Institute of Education. That module aimed to develop the ability of student teachers to carry out systematic inquiry in their professional practice and to act constructively on the findings. The objectives of the module were to enable student teachers (a) to investigate, reflect upon and take action to improve their teaching; (b) to acquire skills necessary to conduct, report and present educational research; and (c) to develop positive attitudes about educational research. The six-credit module and was divided into two phases conducted in three semesters over one-and-a-half calendar years. Phase One was a component taught in Semester Two. Student teachers met for 12 meetings of 3 hours each. Teaching in Phase One involved lectures, group discussions and workshops. The assignment for Phase One comprised (a) an initial proposal submitted at mid-semester for an individual research project in education to be conducted by each student teacher in Phase Two (Feedback was provided for the proposal but it was not graded); and (b) a critical literature review submitted at the end of Phase One in the area of investigation chosen by the individual student teacher. Phase Two involved the implementation of the education research proposed in Phase One. A flexible mode of teaching was used for Phase Two. Student teachers met with the lecturer in small groups as needed for consultation. This study was carried out at Phase One of the module between January and June 2003, just before the student teachers graduated to enter the teaching workforce.

### THEORETICAL FRAMEWORK

This study was informed by the literature on self-directed learning or self-regulated learning (Boekaerts, Pintrick & Zeidner, 2000; Brockett & Hiemstra, 1991; Caffarella, 1993; Long, 1994b; Long, 1997; MacKeracher, 1996; Schunk & Ertmer, 1999; Schunk & Zimmerman, 1998); adult learning (Caffarella, 1993; Flannery, 1993; Merriam & Caffarella, 1999); lifelong

learning and the learning society (Knasel, Meed, & Rossetti, 2000); learning psychology or motivation psychology (Bloom, 1956; Haertel, Walberg, & Weinstein, 1983; Long, 1989; Schunk, 1996); feedback (Butler & Winne, 1995); self-assessment (McDonald & Boud, 2003; Paris & Paris, 2001); and metacognition (Gordon & Debus, 2002).

Contributing factors to self-directed learning of teachers can be grouped into five categories (Mok & Cheng, 2001), namely, cognitive factors, control factors, affective factors, procedural factors and content factors. Cognitive factors involve the learner's metacognition, self-understanding and beliefs about learning as well as his or her awareness and understanding of the task and the learning context. Metacognition refers to the level of understanding the learner has with regard to one's own prior knowledge relevant to the learning task, learning style, learning goal, as well as one's learning strategies, competencies, and beliefs about one's own capacity to learn (self-efficacy) (Butler & Winne, 1995), locus of control (Deci & Ryan, 1994) and attributional beliefs about learning outcomes. Research (Gordon & Debus, 2002) has shown that students with better metacognitive skills are more capable of deep learning. Individuals who have better knowledge and awareness about their own knowledge status and learning targets are more able to engage in regulating their own learning, which in turn has positive effects on learning outcomes and self-efficacy.

Feedback is an important resource for the learner building up his or her metacognitive level. Research (Black & Wiliam, 1998; Butler & Winne, 1995; Schunk & Ertmer, 1999) has also shown that providing the learner with a learning goal, constant feedback and periodic selfassessment (McDonald & Boud, 2003) of their progress is the most effective strategy to sustain self-efficacy, motivation and achievement in the learner. Cognitive factors also include the learner's level of understanding of the nature, expectation, the difficulty level of the learning task, the nature, source and amount of available resources in support of the learning task (Biemiller, Shany, Inglis, & Meichenbaum, 1998). The cognitive factors enable the learner to accurately appraise his or her own knowledge status in relation to the demands of the task, set the learning goal, plan for the learning episode, monitor progress and evaluate the level of achievement. The learner's actions (processes) associated with cognitive factors are evaluation (of own knowledge, task and learning conditions), memory, rehearsal and critical thinking. Boud (1995) considered self-assessment to be imperative for lifelong learning and effective learning and advocated it to be included in university courses. A specific component in the research design for this study was to heighten the metacognitive level of participants through a procedure called the Know-Want-Learn (KWL) method (Ogle, 1986; Carr & Ogle, 1987). Feedback is also included in the design of this study.

The control factors in self-directed learning refer to the learner's deliberate efforts to be in charge of the conditions and outcomes of the learning process. These include the learner's control of self, the learning task and the learning context. According to Kuhl and Goschke (1994), control of self during self-directed learning means (a) attention and intention control (focusing only on the task); (b) emotion and motivation control (aligning the motivation with the learning goal and avoiding emotional states that inhibit task accomplishment); (c) action control (keeping away from counter-intentional impulses and selecting learning strategies deemed beneficial to the task); and (d) volitional control (putting discretionary effort in achieving the goal). Control involves intentional effort, commitment, perseverance and willfulness in the

learning task. When the learner chooses a certain course of action, the learner subscribes to a causal relationship between the action and outcome and accepts responsibility for the outcome (Zimmerman, 1994). Control of the learning context refers to the selection and manipulation of the learning environment (physical, psychological, social and technological), management of learning resources (time, energy, help). Mok, Ma, Liu and So (2005) found that control of the learning environment was considered the most useful learning strategy among Hong Kong primary students. In this study, the learners were given some degree of control through the KWL method in which they specified the topics they wanted most to learn. Nevertheless, there was no design component involving control or collecting data on learner control otherwise. On the other hand, the principal researcher controlled learning task sequence by using a spiral curriculum through which the same topic was revisited at several time points during the semester and the extent of learning was monitored.

The affective factors in self-directed learning include the learner's motivation to learn (Dweck, 1986), attitudes toward learning, learning anxiety, test anxiety as well as the values placed on the learning task and the significance of the learning outcomes. Pascual-Leone and Irwin (1998) reviewed earlier studies by Brookfield (1994) and Knowles (1980) and concluded that motivational, affective and self-developmental factors are even more crucial for the adult learner than for younger learners. They observed that because of the social and professional status enjoyed by adult learners, they had higher stakes in being successful in their learning than their younger counterparts. The participants in this study were student teachers; and, as the module accounted for six credits, their success had major impact on the final award (e.g. the difference between First Class honors or Second Class honors) as well as on future employment opportunities. Consequently, the stakes were high for the participants. In order to facilitate the learners' self-monitoring of progress without increasing their learning anxiety, the ten researchbased principles of formative assessment advocated by the Assessment Reform Group (2001) and Black & Wiliam (1998) were observed in this study. That is, formative assessment was implemented to support learning and to facilitate the participants to become self-directed learners. With the exception of the final assignment, continuous feedback was provided on the learning tasks by peers and the principal researcher during the semester but the tasks were not graded. The learning tasks were all designed to have strong relevance to the module objectives and linked with the final assessment in order to engender in the learners positive task values.

# METHOD

### Sample

Participants for this study included 20 student teachers (5 males and 15 females) who were enrolled in a two-year Bachelor of Education (Primary) degree program. All were majoring in Chinese Language at the Hong Kong Institute of Education, the major provider of teacher education in Hong Kong. They were enrolled in Phase One of the Education Project module taught by the first author between January and June 2003. The student teachers had studied at the Institute for a Certificate in Teacher Education prior to the current program. Only three of them had prior teaching experience (between 1 to 3 years) in local primary schools. After graduation from the Bachelor of Education degree program, the majority of them expected to teach Chinese Language in primary schools in Hong Kong.

### Instruments

Two instruments were used in this study: the Know-Want-Learn (KWL) worksheet and the concept map. Data were also gathered through a reflection question at the end of the semester.

### The Know-Want-Learn (KWL) Worksheet

The Know-Want-Learn (KWL) (Ogle, 1986; Carr & Ogle, 1987) method was originally designed for enhancing expository reading. It was used in this study as a learning strategy to promote self-learning among student teachers. The KWL learning strategy has three components of self-assessment and reflection for learning, corresponding to each of the characters in the acronym KWL, as follows:

- 1. Know (K): Self-assessment and reflection on what the learner already <u>K</u>nows about the topic before learning. This is elicited by the question "What do you already know (K) about the topic?"
- 2. Want (W): Based on the self-assessment, reflection upon what the student still <u>W</u>ants to learn before and during learning. This is elicited by the question "What do you want (W) to know about the topic?" and
- 3. Learned (L): Self-assessment and reflection upon what has been <u>L</u>earned at the end of learning. This is elicited by the question "What have you learned (L) about the topic?"

The rationale for the three components in the KWL learning strategy is as follows:

*Knowledge (K).* The *Knowledge* component of KWL aims to heighten the learners' awareness by bringing to their consciousness their prior knowledge on the topic to be learned. Prior knowledge has been identified in the literature (Alexander & Judy, 1988; Weinstein & Mayer, 1986) as one of the most important contributors to subsequent learning. Self-assessment on prior knowledge helps the learner to consolidate what has been learned and provides a strong schema for new learning (Boud, 1995).

*Want (W).* The *Want* component in KWL aims to guide learners to ask relevant questions about the topic to be learned. In so doing, learners are guided to set their learning goals. Goal setting is one of the key steps for self-directed learning. A motivated learner is more likely to sustain effort in learning than an un-motivated learner. Garrison (1997) used a "collaborative constructivist" perspective to interpret self-directed learning. A collaborative constructivist perspective means that the learner takes the responsibility to construct meaning with support from others (e.g. the teacher) in confirming worthwhile knowledge. The literature (Boekaerts, 2002; Haertel et al., 1983; Long, 1989) underscores motivation as a key to successful learning and places it over and above sociological (e.g. peer influence) and pedagogical factors (e.g. quantity of instruction). The learner has to have the need to enter the learning task as well as the motivation to continue with the learning task. The Want component in the KWL method is to help learners establish the need and motivation for learning. Further, the learners in the class are

asked to share their individual lists with their classmates and, based on their discussion, compile a class list of topics that they want to learn. The sharing and interaction among learners promotes motivation to learn. In addition, the compilation of the class list gives ownership to the learners (Ogle, 1986).

*Learned (L).* The *Learned* component in KWL aims to provide synthesis and consolidation of new learning. Self-assessment on what has been learned helps construct the meaning of the new learning by anchoring it on prior knowledge and assessing both the content and extent of learning. What has been learned is explicitly addressed by the learner through self-questioning and self-reporting at the end of the learning episode in KWL. The KWL method has been used by a number of researchers (e.g. Jared & Jared, 1997) who reported favorably on the method.

# Concept Map

A concept map is a schematic representation of main concepts (represented by nodes) and interrelationships (represented by lines joining the nodes) among concepts within a specific domain of knowledge (Novak, 1990). Lines in concept maps are labeled to explain the nature of the relationships between concepts (Novak, 1990). The literature has documented at least three major uses of concept maps: (a) as a teaching/learning tool to organize and present main concepts in form of a conceptual framework (Fraser, 1996; Moen & Boersma, 1997; van Boxtel, van der Linden, Roelofs & Erkens, 2002), (b) as a diagnostic tool for formative assessment of student learning (Cowin, 1998; Fraser, 1996; George & Cowan, 1999; Laffey & Singer, 1997), and (c) as a research tool (Wallace & Mintzes, 1990).

Several authors had written about the benefits of concept maps as a learning and research tool. These researchers found that concept map contributed to making learning meaningful to students as students articulated their conceptual framework in their own words (Fraser, 1996; George & Cowan 1999) and took charge of their learning (van Boxtel, et. al, 2002). In the construction process, the learner was forced to focus on key components of learning and appreciate the relational structure among these components (George & Cowan, 1996; Stoyanova and Kommers, 2002). Further, the graphic and symbolic nature of concept maps are particularly appreciated by those learners who are visually disposed (George & Cowan, 1996). Stoyanova and Kommers (2002) observed that because the concept map resembles how knowledge is organized in the human mind, it supports mental imagery, links psychological constructs with external representations and stimulates self-appraisal of the learner. In this study, the concept map was used as a tool to facilitate students' self-assessment as well as a research tool.

### Procedures

This study spanned one semester of 12 lectures of the Education Project module. The design was based on the principles of self-directed learning.

### Design of the Instructional Intervention

At the first lecture of the module, student teachers formed self-selected small groups of four or five. The importance of teachers as researchers was discussed in small groups and then in the

whole class. Then student teachers were introduced to the method of concept mapping (Novak, 1990) as a reflective tool. They were then invited to reflect and represent their understanding of educational research in the form of a concept map, which was to be used as a starting point of their learning. It was then explained to the student teachers that they were to develop their self-directed learning in the module through designing and implementing an educational research project that was of interest to them. The background theory of self-directed learning was also discussed. In addition, the topics and dates for the whole semester were provided to the class to support student teachers in planning their learning for the module.

Subsequently, at the beginning of Lecture Two, student teachers were guided in a socially supportive environment to reflect upon what they already knew about the topic by completing the Know (K) column of the worksheet. They were also invited to write down what they would like to learn about the topic by completing the Want (W) column. They were permitted to modify the W column throughout the lecture. At the end of the lecture, student teachers were invited to self-assess what they had learned by completing the Learn (L) column of the KWL worksheet. In this way, the students became aware of their prior knowledge, learning motivation and learning outcomes through self-reflection and self-assessment during their learning process. The KWL worksheet was administered during Lectures 2, 4, 7 and 12. Results from Lecture Two only were included in this study.

Student teachers were supported in their learning using a spiral curriculum design (Bruner, 1966; 1996). They were guided through the lectures by a Self-Learning Research Worksheet, which included a column headed *Self-learning research steps, considerations and reflections*, a space per item for peer feedback and another space per item for self-evaluation. The eight questions in the Self-Learning Research Worksheet were:

- 1. What is the title of the research you intend to undertake at your school?
- 2. Why is this topic important to you?
- 3. What are the possible outcomes of your action plan?
- 4. How do you plan to conduct your research?
- 5. What will be the main sources of your data?
- 6. Do you expect to have cooperation from your colleagues? Where are the possible barriers? How are you going to deal with them?
- 7. Who would be your allies? How would you involve your school?
- 8. What ethical issues do you need to consider?

Student teachers completed the Self-Learning Research Worksheet, discussed it with group members for feedback, and then submitted these to their lecturer (the first author) who provided feedback. The Worksheet was not graded but was refined iteratively during several rounds of reflection-discussion-critique-submission-feedback. Student teachers modified their designs and refined their responses as they learned more and more about educational research methods. Eventually, the Worksheet became a basis for the student teachers' initial research proposal. The intention was that the individual proposals would provide a context for the student teachers to make sense of the educational research methods introduced in the lectures. It was envisioned that this would facilitate the transfer of learning from theory to practice. In addition, since the research topics were selected by the student teachers to be implemented in their own classrooms the following year during their field-experience, it was expected that student teachers would be more motivated. The Self-Learning Research Worksheet was a teaching tool rather than a research tool in this study and therefore not analyzed for such purposes.

At the end of the semester, student teachers were asked to respond to an open-ended question on their self-learning development: "*How has this module contributed to your development of self-directed learning*?

# Data Collection and Analysis

*Reflection question.* To address the first research question, data from student teachers' responses to the End of Semester Reflection open-ended question were inspected to identify themes. Frequency counts were tallied to prioritize the themes noted.

*KWL responses*. To address the second research question, the student teachers' responses to the KWL before and after Lecture 2 and changes in concept maps from Lecture 1 to Lecture 5 were analyzed. Responses to the KWL were subjected to content analysis using Biggs's (Biggs & Collis, 1982) SOLO (Structure of the Observed Learning Outcome) taxonomy framework. Many researchers have reported on the use of SOLO taxonomy for analyzing the levels of learning on educational research from students' responses to open-ended tasks. We had consulted specifically the work by Boulton-Lewis and her associates (2001), as well as work by Burnett (1999) in developing our analysis framework. Adapting the SOLO taxonomy to this study, the levels of learning on educational research methods were defined as follows:

- Prestructural (P): Responses at this level show no sign of understanding about educational research. The indicators are either the student teacher refuses to engage in the task, or mentions something not related to educational research.
- Unistructural (U): Responses at this level show only one aspect relevant to educational research, indicating only minimal amount has been learned. The indicators for this level are either only one point has been mentioned or only one single aspect is developed by the student teacher.
- Multistructural-Weak (M-): Responses at this level show emerging signs of learning of concepts relevant to educational research. There are, however, no signs of connection or integration among these concepts. The indicator for this level is that two or more separate points about educational research are stated without either elaboration on, or consolidation of, these points.
- Multistructural-Sound (M): Responses at this level show firm evidence of several relevant aspects of educational research learned; however, there is no attempt by the student teacher to connect or integrate the aspects. The indicators for this level include: (a) several points are stated with only simplistic development on one or two of the main points; or (b) several responses are stated which give a 'list' feel to the response, with simplistic development of a few of the main points; or (c) only one point is stated but it develops along the line of 'how' to undertake educational research.

- Multistructural-Strong (M+): Responses at this level provide convincing evidence that several relevant aspects of educational research have been learned. Although there is yet no overall integration of the independent aspects, there is clear evidence of attempts to integrate some of the aspects. Indicators for this level are either development of several of the main points through elaboration, extension and/or exemplification, giving a 'chunk' feel to the response, or more than one elaboration on 'how' to undertake educational research.
- Relational-Sound (R): Responses at this level show strong tendency towards integration of relevant aspects of educational research into a coherent concept or theme, although there may still be a small number of points not integrated in the overall structure. The indicators for this level of learning are elaboration, extension and exemplification of an important concept or theme in education research.
- Relational-Strong (R+): Responses at this level show clear evidence of integration of relevant aspects learned into a coherent concept or theme. The indicator for this level is a strong structure being developed throughout the entire response with no list or unconnected aspects.
- Extended Abstract (E): Responses at this level of learning show an extension of the learned concept or theme to a new area or domain. Indicators for this level of learning include the application of the concept or the transfer of learning to a new area, domain, or more abstract situations.

*Concept maps*. The concept maps drawn by student teachers at the end of Lectures 1 and 5 were analyzed to identify evidence of change in their complexity of knowledge about educational research. A number of scoring methods for concept maps have been reported in the literature (Novak, 1981; Novak & Gowin, 1984; Wallace & Mintzes, 1990). This analysis implemented the methods developed by Novak (1990, 1991, 1993), and Wallace and Mintzes (1990). The concept maps were analyzed according to the number of concepts identified in the map, the number of meaningful and valid relationships, levels of hierarchy, number of examples, and number of cross-links. Further, an overall score for each concept map is computed by adding these five attributes, giving a weight of 5 to the levels of hierarchy and 10 to the number of cross-links (Wallace & Mintzes, 1990). The scoring of the attributes is as follows:

- Concepts: meaningful and valid concepts (e.g. qualitative and quantitative approaches) in educational research are counted.
- Relationship: The relationship between two concepts is a scientific proposition that a link exists between them. It is shown in the concept map by a line joining the two concepts. The meaning of the relationship is clarified by the label put on the line. Relationships are scored by counting the number of links, with or without labels. Although labels help to clarify the meaning of the relationships, they are not included in the computation for this study. Instead, the number of link labels is reported separately.
- Level of Hierarchy: Concepts are hierarchically ordered from specific to general. Five marks are given per level of hierarchy. It is assumed that student teachers who have more levels of

hierarchy in their concept maps also have more sophisticated understanding about the concepts involved in educational research methods.

Examples: The number of illustrative examples is counted for scoring.

Cross-Link: A Cross-Link is the meaningful and valid relationships between a cluster of concepts and another cluster of concepts at the same or different levels of hierarchy. The number of cross-link labels is also scored.

Overall score is computed using the following formula:

Overall score = Concept + Relationships + 5 \* (Level of Hierarchy) + Examples + 10\* (Cross-Link)

### MAJOR FINDINGS

# Contributions of the Education Projects Module to Student Teachers' Development of Self-directed Learning

Data to address this research question were derived from student teachers' responses to the End of Semester Reflection open-ended question "*How has this module helped you in your development of self-directed learning*?" collected at Lecture 12. The sixteen student teachers who attended the lecture all responded to the item; four student teachers were absent. Content analysis of the written responses from student teachers identified three major themes, namely, management of resources, help seeking, and learner control. It must be noted that responses from student teachers might be classified into more than one theme. Other themes that emerged included goal setting, motivation and awareness of self-directed learning.

### Management of Resources

The strongest theme was the identification and management of learning resources for selflearning, with 15 occurrences among 16 respondents. An example in the student teachers' own words is "I learned to make reference to the literature including other people's theses, their approaches (to research) and look for reference materials and resources in the library (Student teacher ID 3)". Resources mentioned by student teachers were confined mainly to those available from the library or the internet, for example, journal articles, literature and books from the library, the internet, and e-journals. There was no mention of other resources such as newspapers, government reports, museums, etc.

### Help-Seeking

The next strongest theme was seeking help from others in support of one's own learning. This theme was represented in nine responses (out of 16). The target of help-seeking included two sources: peer student teachers and lecturers. There was no mention of such other sources as experts in the same field outside of the Institute, policymakers, or social elites. Help-seeking was associated strongly with issues or difficulties during the process of learning. For example, one student teacher wrote, "I learned how to seek help when met with difficulties (Student teacher ID 7)." Help-seeking was not interpreted as dependency on others. Rather, it was understood as a strategy for problem solving after one had tried. This was best expressed by one student teacher, "[I learned] to try hard to solve the problem when there are difficulties. If I

really cannot solve the problem, then I should seek effective help, explore and investigate from multiple perspectives (Student teacher ID 11)."

# Learner Control

The third major theme identified was learner control in the form of self-initiation, self-direction, self-initiation, self-regulation, self-exploration and freedom. There were six comments (out of 16 responses) that reflected this theme. For instance, one student teacher expressed his or her self-direction this way, "I search for materials relevant to my research topic; I set the research topic myself; and when there are problems, I've learned to take the initiative to seek help from classmates and the teacher (Student teacher ID 5)." Another student teacher said, "I initiated the meetings with my lecturer and that's why I need to self-regulate and plan my progress in advance (Student teacher ID 8)." Freedom to arrange for one's learning was highlighted by one student teacher (Student teacher ID 6).

Management of learning resources, help seeking and learner control were ways the learner exercised control during self-directed learning. Three of the student teachers mentioned setting the learning targets. Two of the 16 respondents indicated explicitly that they had developed deeper understanding of the meaning of self-directed learning. One of them said that self-directed learning was different from solitary learning and the other articulated the gradual process of goal clarification through reflection, observation, discussion with peers and making reference to e-journals.

# Changes in the Capacity of Student Teachers to Undertake Independent Systematic Inquiry in Education

The student teachers' capacity to conduct independent systematic inquiry in education was considered to be an essential building block for their continued self-directed learning in relation to their teaching practice. Evidence for change was collected from two sources. Evidence for substantive learning within lecture was gathered through the Know-Want-Learn (KWL) worksheets. Evidence for change in conceptions of educational research across lectures was gathered using the concept maps drawn by the student teachers.

# Within-Lecture Changes in Student Teachers' Learning

Student teachers' responses to the K (*Know* question: "*What do you know about educational research methods?*") and the L (*Learn* question: "*What have you learnt [about] educational research methods at this lecture?*") columns of the KWL worksheets at the beginning and end of Lecture Two respectively were analyzed for content to identify evidence for within-lecture changes. Lecture Two involved an introduction to student teachers of different paradigms of and approaches to educational research.

Nineteen students were present at Lecture Two and all responded to KWL. One student was absent from the lecture. Analysis of responses to the KWL worksheet at Lecture Two showed that at the beginning of lecture, the majority of responses were at either the Multistructural-sound (M; 7 out of 19 respondents) or the Unistructural (U; 6 out of 19 respondents) levels on SOLO

taxonomy. There was no response at Relational or above levels. At the end of the lecture, the majority of the responses were at the Multistructural-sound (M; 7 out of 19 respondents) level. Three responses were at the Relational Sound (R) and another 1 at Relational Strong (R+) levels. These results are displayed in Table 1.

Count				Learned					Total
Know	Р	U	M-	М	M+	R	R+	Е	
D		1							1
P U	1	1		2					
0	1	2		3					0
M-		1	1	1					3
Μ				3	1	2	1		7
M+					1	1			2
R									0
R+									0
E									0
Total	1	4	1	7	2	3	1	0	19

*Table 1.* Change in Conception of Educational Research from "Know" to "Learned" during Lecture Two Using SOLO Taxonomy

Notes:

 $1. \qquad \mbox{The SOLO taxonomy levels (P: Prestructural, U: Unistructural, M-: Multistructural-Weak, M: Multistructural-Sound, M+: Multistructural-Sound, M-: Multistructural-Sound, M-$ 

Multistructural-Strong, R: Relational-Sound, R+: Relational-Strong, and E: Extended)

2. 19 student teachers were present at Lecture Two and all responded to KWL worksheet

3. Student teachers on the diagonal showed no evidence of progression at the SOLO taxonomy; student teachers above the diagonal showed signs of progression and those below the diagonal showed signs of regression.

About half (10 out of 19) of the student teachers made a progression from lower levels to higher levels of learning within Lecture 2. Seven out of 19 student teachers did not show any evidence of change in their conceptualization of the practice of educational research. Another two student teachers (2 out of 19) showed regression from higher to lower levels of learning according to the SOLO taxonomy. As can be seen from Table 1, the two student teachers who regressed to lower levels had low prior knowledge. One was at unistructural and the other at multistructural-weak Nevertheless, not all student teachers with weak prior knowledge regressed. Four level. progressed to higher levels, and three of them made substantial gain in their levels of conception about education research. Student teachers at multistructural-sound or above levels either stayed in the same level or progressed to upper levels at the end of Lecture Two. These results suggest that considerable individual differences existed. Some learners required a longer period of incubation than others for learning to manifest. Perhaps learners with weak prior knowledge were less stable in their levels of conceptualization such that regression could occur. It might also be that the alignment of teaching and learning was less favorable for learners with weak prior knowledge than for those with strong prior knowledge.

# Between-Lecture Changes in Student Teachers' Learning

The concept maps drawn by student teachers at the end of Lectures 1 and 5 were analyzed to identify evidence of change in their complexity of knowledge about educational research, as described under *Data Analysis*.

Eighteen student teachers responded at both Lectures 1 and 5. Their concept maps were analyzed and compared for evidence of change. Two forms of change were observed. The first change was an increase in the complexity of understanding. An example is taken from the two concept maps drawn by a student teacher (ID 8). Figure 3 depicts the concept map drawn by the student teacher at Lecture One. The concept map was rather simplistic with only 7 concepts derived from the central concept of educational research and arranged in 2 levels of hierarchy. The concept map drawn by the same student teacher at Lecture 5 was much more sophisticated in its detail and structure. The change from simple to sophisticated conception is presented in Figures 1a and 1b.



Figure 1a. Concept map of a student teacher on educational research at lecture one.



Figure 1b. Concept map drawn by the same student teacher on educational research at lecture 5.

There was significant increase in the number of concepts identified (pairwised *t*-value = 3.17, df = 17, p < 0.05), the number of relationships (pairwised *t*-value = 2.99, df = 17, p < 0.05), and the overall score of the concept map (pairwised *t*-value = 2.73, df = 17, p < 0.05). There was no statistically significant change in the number of examples, level of hierarchy, or cross-links. The results are presented in Table 2 and illustrated graphically in Figures 2a, b, and c.


Figures 2a and b. Changes in the number of concepts and relationships from lecture one to lecture five.



Figure 2c. Change in concept map scores from Lecture one to Lecture five.

		Mean	Min	Max	S.D.	Pairwise	df of	Sig. of	Corr.
						<i>t</i> -value	<i>t</i> -value	<i>t</i> -value	
Number of Concepts	L1	22.65	11	39	8.59	3.17*	17	0.01	0.71*
	L5	29.72	11	56	12.16				
Number of									
Relationships	L1	24.55	14	42	8.60	2.99*	17	0.01	0.64*
	L5	32.67	11	59					
Number of Links									
Labeled	L1	3.40	0	20	5.39	-1.39	17	0.18	0.86*
	L5	2.72	0	24	5.82				
Levels of Hierarchy	L1	4.85	3	9	1.73	0.64	17	0.53	0.56*
-	L5	5.00	3	8	1.33				
Number of Examples	L1	0.60	0	9	2.04	0.68	17	0.51	-0.20
1	L5	1.17	0	6	1.89				
Number of Cross Links	L1	0.10	0	2	0.45	-1.00	17	0.33	1.00*
	L5	0.06	0	1	0.24				
Overall Concept Map									
Score	L1	56.25	33	103	18.64	2.73*	17	0.01	0.68*
	L5	71.39	30	124	27.45				

*Table 2.* Comparison of Concept Maps Drawn by Student Teachers at Lecture 1 and Lecture 5

Notes: 1. 18 student teachers completed responses at Lecture 1 and Lecture 5

2. Results significant at 5% level are indicated "\*"

3. Overall Concept Map Score =

Concept + Relationships + 5\* (Levels of Hierarchy) + Example + 10\*(Cross Link)

The second type of change observed was qualitative in nature and involves the focus of the concept maps. Concept maps drawn by student teachers at Lecture 1 tended to focus on different domains of application of educational research (e.g. research on curriculum, assessment, and teaching methods), or on different stakeholders (e.g. teachers, parents or students). These foci were changed in Lecture 5 to educational research methods (e.g. objectives of research, approaches to educational research).

## DISCUSSION

This study aimed to assess development in student teachers of the competence for self-directed learning. The combined effects of globalization, new developments in the conceptions of knowledge and learning, the rapid growth in information and communication technology, and the international movement towards a strongly knowledge-based world economy, have made self-directed learning very important to learners in the 21<sup>st</sup> century. The capacity for self-directed

learning is as important to teachers as to students. Against this backdrop, however, research into self-directed learning is not without its challenges.

As pointed out by Long (1990), Boekaerts (1997) and others, self-directed learning is a complex process with several interrelated and interacting components. To focus on any single component without investigating the whole process does injustice to the other components and the entire self-directed learning process. In addition, the dynamic nature of the self-directed learning process requires close and long term monitoring, making such snap-shot data collection methods as Likert-type questionnaires on single aspects rather inadequate. The level of meta-awareness of the participants and their capacity to articulate the process also pose serious problems to the validity of the data collected using such other means as in-depth interview or self-reporting. This study has an additional limitation; one imposed by a major external event. The outbreak of SARS around March – April 2003 in Hong Kong had significant impact on the immediate daily routine of teachers and students as well as on long term societal values. Schools were closed for at least six weeks; almost 200 families were traumatized by deaths; and the inadequacy of the system to handle crisis was brutally exposed. It was obvious to the researchers that the priority of the student teachers was no longer on this study. The affective aspects of self-directed learning cannot be under-estimated. Although designed as a study spanning over 12 lectures in one semester, the data were compromised. Consequently, the interpretation of the findings in this study must proceed cautiously in the light of such methodological limitations.

In spite of the above cautionary notes, the findings from this study permit some cautious optimism. Although the changes were not as substantial as hoped for, evidence showed that student teachers could develop their competence for self-directed learning. The most significant changes involved advancements in student teachers' capacity in controlling their learning processes (information identification and help seeking) and their deepened conception of educational research. There were also burgeoning signs of growing metacognition. Despite these positive signs, there is still considerable room for further development.

It might also be informative to reflect upon areas of deficiency identified in this study. There was no affirmative evidence that the student teachers had developed strong motivation, positive attitudes or strong volition for educational research. There was no compelling evidence of student teachers' development in self-efficacy beliefs, or enhanced self concept on the ability to undertake independent systematic inquiry. The discourse tended to be descriptive rather than provocative or analytical. Evidence of growth in learning strategies was confined to the external (e.g. search for literature, references, and undertake literature review) and technical (e.g. questionnaire construction) rather than reflective or strategic. In addition, it was hard to detect developments in the capacity for control of motivation, emotion, attention or encoding from participants' responses. The overall picture tended to suggest that learning had begun but there The literature shows that self-directed learning is not a static were no major breakthroughs. phenomenon. It may change with the nature of the task. Since the module in this study focused on the procedures of educational research, participants' level of processing could be affected. Perhaps a stronger and more explicit intervention is needed. Given the importance of selfdirected learning to teachers, it is worth refining this study by enhancing the intervention strategies and to repeat the study across different modules.

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# AGE AND GENDER DIFFERENCES IN SELF-DIRECTED LEARNING READINESS: A DEVELOPMENTAL PERSPECTIVE

# Thomas G. Reio, Jr. and Ward Davis

## ABSTRACT

This exploratory study investigated age and gender differences in self-directed learning readiness across the lifespan. The Self-Directed Learning Readiness Scale and a demographic survey were administered to three groups of participants: high school students, university dental students, and adult educational center students (N = 530). Correlations, one-way ANOVAs, and ANCOVAs were employed to examine possible individual differences in self-directed learning readiness. After controlling for ethnicity, statistically significant age differences emerged demonstrating that those in their 30s, 40s and 50s had higher self-directed learning readiness scores than the adolescents and young adults. Tentatively suggesting a developmental trend among the age groups, the self-directed learning readiness scores increased significantly from adolescence until the 50s for both males and females. Overall, gender differences were not found, but a significant age x gender interaction indicated that the age 14-20-year-old females had significantly higher self-directed learning readiness scores than the males. Implications and recommendations for future research were discussed.

Garrison (1997), Merriam & Caffarella (1999), and Long (2000a, 2000b) lament the lack of clear direction in recent self-directed learning research. Due to its vital importance in adult educational theory building in particular, new research is required to understand the construct and its relevance to learning and development more precisely. Self-directed learning, like many psychological and sociological constructs (e.g., critical thinking, unemployment) lacks a unified definition of what exactly it might be, arguably to the detriment of the field. Most definitions, however, contain the following key elements: (a) self-directed learning is a process of learning based on adult educational principles and (b) that there is some element of personal control by the learner over the planning, monitoring, and management of the learning (O'Shea, 2003).

In one attempt at sense making of the voluminous, yet contrasting self-directed learning research, Merriam and Caffarella (1999) identify three major research facets of the construct: (a) goals of self-directed learning (Mezirow, 1985), (b) self-directed learning as a process (Garrison, 1997; Grow, 1991), and (c) self-directedness as a personal attribute (Guglielmino, Guglielmino, & Zhao, 1996).

Closely related to the philosophical position of the researcher, Merriam and Caffarella's (1999) first research facet or direction involves exploring the goals of self-directed learning as they relate to personal growth. The goals of (a) enhancing learner self-directedness, (b) fostering transformational learning, or (c) promoting emancipatory learning are the three aims of self-directed learning, with enhancing learner ability to be self-directed being the most common aim. According to this most common aim, an educator's job is to assist individuals in developing the requisite skills for engaging in self-directed learning such as planning, monitoring, and evaluating their own learning. The second research direction relates to the conception of self-directed learning as a process. For example, Garrison (1997) proposes a comprehensive multi-dimensional, collaborative constructivist model of self-directed learning comprised of three

overlapping dimensions: self-management, self-monitoring, and motivation. The idea is that each dimension contributes to self-directed learning by assisting learners in the process of "taking responsibility to construct personal meaning" through collaborative activities (p. 30). The final major research direction concerns self-direction as a personal attribute or as the psychological readiness to learn. Although there is evidence that self-directed learning readiness exists as a temporary psychological state, it is studied most often as a stable personality trait, suggesting that there may be individual differences in the propensity to be self-directed (Long, 2000a). Much of the research in this particular area has been conducted through empirical studies that employ the Self-Directed Readiness Learning Scale (*SDLRS*; Guglielmino, 1977). Although not without criticism (e.g., Brockett, 1985; Field, 1989), the measure in general has demonstrated acceptable psychometric properties (Chien, 2004), and considerable research and practical utility in the bulk of the research conducted with the instrument.

There is some evidence that age, gender, and ethnic differences in self-directed learning readiness exist among individuals (Long, 2000a; McCauley & Hezlett, 2001; Reio, 2004), but remarkably little effort has been expended to systematically increase our understanding of this phenomenon. Why do such differences exist? How might these individual differences manifest themselves in various learning contexts? Do situational influences like motivational levels or lack of learning resource access impact the expression of the tendency to be self-directed? An understanding about the nature of these differences could be a promising avenue of research in the field of education. Educational endeavors could be guided by new knowledge about the extent to which individual differences in self-directed learning readiness exist. The next step would be to determine how we might embrace such differences best in both formal and informal learning contexts.

In the field of educational psychology, new knowledge about the possible developmental nature of self-directed learning readiness could augment developmentally appropriate teaching practice. Psychological constructs closely related and integral to self-directed learning like metacognition (Flavell, Miller, & Miller, 2002; Garrison, 1997), reflection (Piaget, 1971), effective memory strategy use (Bjorklund & Douglas, 1997), motivation (Guthrie & Alao, 1997), self-regulation (Bandura, 1997) and attention (Panksepp, 1998) have clear developmental underpinnings, i.e., each has a well-studied positive developmental trajectory in normal people. Recent thoughtprovoking brain research also backs the notion that metacognitive, self-regulatory, and attentional capacities are developmental in nature; the frontal cortex that supports such cognitive processes does not mature fully until late adolescence or early adulthood (Goldberg, 2001; Goldberg, Harner, Lovell, Podell, & Riggio, 1994). Thus, we might not expect complete facility with such cognitive processes in spontaneous or structured everyday activity until the frontal cortex fully matures. The evidence suggests that self-directed learning might be developmental in nature, yet it is unclear to what degree. Notwithstanding, even if one were "ready" to engage in self-directed learning (e.g., metacognition, spontaneous strategy use, attention) in a maturational/biological sense, expression of this readiness might be dampened situationally by environmental constraints such as lack of experience in the subject area and learner anxiety (Candy, 1991), motivation (Garrison, 1997), cognitive learning style preferences (O'Shea, 2003), and traumatic brain injury (Kolakowsky-Hayner & Kreutzer, 2001).

We need more information about the developmental trajectory of self-directed learning readiness to guide theory building in the field and to guide our thinking about educational practice. Unfortunately, existing models of self-directed learning do not recognize the relevance of individual differences sufficiently and thus provide inadequate research direction when trying to develop a more complete picture of self-directed learning as a source of individual development (e.g., Cavaliere, 1996; Garrison, 1997). As teachers and parents, when is the best time (when is it developmentally appropriate) to initiate self-directed learning readiness at different stages of the lifespan? For example, might we expect older adults to exhibit higher or lower levels of self-directed learning readiness in the workplace or classroom? Should we expect gender and ethnicity to interact with possible age differences in self-directed learning readiness? Why or why not? An individual differences research approach might be a productive initial method to systematically investigate these important questions.

Recent individual differences findings about self-directed learning readiness have been contradictory (McCauley & Hezlett, 2001). In a study of prior knowledge, self-directed learning readiness, and curiosity's influence on classroom learning performance, Reio (2004) reported individual differences in self-directed learning readiness; being older, male, and Caucasian predicted higher self-directed learning readiness and classroom learning performance. Conversely, with a Korean version of the SDLRS, Yoo, Cheong, and Cheong (2000) found that the younger participants in their study of continuing education adults demonstrated the highest self-directed learning readiness. Utilizing both Chinese and English language versions version of the SDLRS, Guglielmino et al. (1996) compared Chinese and American scores on the measure; Chinese scores were lower. Age and gender differences were not reported. Further, Hoban & Sersland (2000) found that older students from two university samples had higher SDLRS scores, yet gender differences were not found. Finally, in a study of 12<sup>th</sup> grade students with exceptional educational needs, Bulik (1996) reported that there were no statistically significant differences in SDLRS scores between exceptional need males and their non-handicapped peers, while exceptional need females demonstrated significantly lower scores than their non-handicapped peers. Overall, there is substantial evidence that individual differences in self-directed learning readiness vary by age, gender, and ethnicity, but the extent of such differences and their possible interaction has not been examined sufficiently. In a preliminary effort to examine these possible individual differences, this exploratory study investigates age, gender, and ethnic differences and their possible interactions in self-directed learning readiness.

#### METHOD

#### **Participants**

The sample consisted of 61 high school students, 358 dental students, and 111 adult education center participants in the middle west region of the United States (N = 530). The high school sample was drawn from an academically-oriented school, while the dental sample was comprised of mostly first-year dental students. The adult education sample consisted of participants from seven adult educational sites across the state of Kentucky. The combined sample was 88.3% Caucasian, 10.9% African-American, and .8% Hispanic. Fifty-one percent of the participants were male (n = 272) and the mean age was 28.5 (SD = 8.3; range 14-59). Individuals participated

voluntarily under the condition of confidentiality; four declined participation at one adult education center. Twenty-two protocols were excluded from the study due to being incomplete on more than two of the research variables. Table 1 presents further demographic breakdowns.

## Research Measures

Self-directed learning readiness was measured with the *Self-Directed Learning Readiness Scale*-Form A (*SDLRS*; Guglielmino, 1977). The *SDLRS* is a self-report instrument containing 58 items. Respondents are asked to indicate their level of agreement to a 5-point Likert scale, ranging from 1 "almost never true of me" to 5 "almost always true of me" on each item. The 58 items are subsequently summed (17 items are reverse coded) to determine the total *SDLRS* score. To be clear, the *SDLRS* is designed to be a trait-like, global measure of self-directed learning readiness. A number of previous researchers have reported high internal consistency of the measure (e.g., .86; Reio, 2004). The Cronbach's alpha for the *SDRLS* in the current study was .81 (M = 223.75; SD = 24.34). A short demographic survey was also administered after the *SDLRS* had been completed.

Variable			Age Grou	ир				
	14-16 ( <i>n</i> =40)	17-20 ( <i>n</i> =48)	21-29 ( <i>n</i> =226)	30-39 ( <i>n</i> =145)	40-49 ( <i>n</i> =63)	50-59 ( <i>n</i> =8)	Total ( <i>N</i> =530)	
Male	20	28	118	68	34	4	272	
Female	20	20	108	77	29	4	258	

Table 1. Demographic Characteristics of the Sample

# Procedures

To best represent a broad range of participants, volunteers were recruited from a diverse set of educational sites. To be clear, this was a convenience sample of research participants, appropriate for exploratory research of this type (Crocker & Algina, 1986). The high school participants were recruited by a trained collaborator in connection with ROTC (Reserve Officer Training Corps) program applicants. The dental students were recruited at a series of orientation workshops for dental school by a second trained collaborator, while the adult education center participants were recruited through an evaluation project by the author. At each site, the participants were informed of the purpose of the study and asked to volunteer twenty minutes of their time to complete the two research instruments. Four individuals refused participation at an adult educational center due to work obligations.

# RESULTS

After screening the data for input errors and outliers, the research variables (*SDLRS*, age, gender, and ethnicity) were intercorrelated to search for the strength and direction of relationships among the variables. Age had a low, but positive statistically significant relationship with both self-

directed learning readiness (r = .24, p < .001) and ethnicity (r = .14, p < .001). Self-directed learning readiness also demonstrated a low relationship with ethnicity (r = .09, p < .03). These results indicate that both the older participants and the African-American participants in this study were more likely to perceive themselves as being self-directed. Gender did not demonstrate a statistically significant relationship with any of the variables. A 1 X 3 (sample group) analysis of variance (one-way ANOVA) was subsequently conducted to search for systematic differences between the three sample groups on the dependent variable. The results indicated that there was a significant main effect F(2, 524) = 7.04, p < .01, partial  $\eta^2 = .035$ . Post hoc investigation with relatively stringent Scheffé tests ( $\alpha = .01$ ) indicated that the high school student group had statistically significantly lower *SDLRS* scores than the dental student group only. There was not a significant difference in self-directed learning readiness scores between the two non-high school samples.

Following the correlational and one-way ANOVA analyses, a 2 (gender) X 6 (age group) between-subjects analysis of covariance (ANCOVA) was performed to ascertain the effect of gender and age (independent variables) on self-directed learning readiness when controlling for ethnicity. Ethnicity was handled as a covariate to increase statistical power (Cohen, 1988), as there was evidence of a significant relationship with the dependent variable in previous research studies (e.g., Chien, 2004), and a relatively low number of African-American and Hispanic participants in this research. To be consistent with previous cross-sectional research (Giambra, Camp, & Grodsky, 1992; Reio & Choi, 2004; Strauss & Bichler, 1988), we placed participants in six distinct age groups: 14-16, 17-20, 21-29, 30-39, 40-49, and 50-59. Age was therefore treated as a categorical variable (see Table 2).

After significant adjustment by the covariate of ethnicity, F(1, 517) = 3.94, p < .05, partial  $\eta^2 = .01$ ), self-directed learning readiness varied significantly with age, F(1, 517) = 6.95, p < .001, partial  $\eta^2 = .063$ . On the other hand, self-directed learning readiness did not vary significantly with the gender variable, F(1, 517) = 3.16, p = .076. Further, the interaction between gender and age was statistically significant, F(5, 517) = 3.77, p < .01, partial  $\eta^2 = .035$ . The magnitude of effect size for each variable was in the small to low-medium range (Cohen, 1988). See Table 3 for a summary of the results.

					Age (	Group						
	14-1	6	17-	20	21-2	29	30-	39	40-4	19	50-5	9
	M	F	М	F	М	F	М	F	М	F	М	F
<u>SDLR</u>												
М	197.8	216.1	207.3	219.0	221.8	221.8	231.9	228.3	226.1	233.6	229.8	223.0
<u>SD</u>	29.0	24.3	25.4	26.4	23.0	21.9	22.2	22.3	22.7	19.4	25.1	22.4

*Table 2.* Means and Standard Deviations for *Self-Directed Learning Readiness Scale* by Age Group and Sex of Participant

*Note*. N = 530.

Comparison of the adjusted means revealed that the self-directed learning readiness scores increased with each age group until the 50s. Thus, there was a statistically significant difference between the 14-16, 17-20, and 21-29 year-olds (their adjusted scores were lower) and the 30-39 and 40-49 year-olds. The gender and age interaction suggests that the younger females were more likely to indicate higher levels of self-directed learning readiness than the younger males, while evening out in the 20s and 30s.

Source	SS	df	MS	F	р	$\eta^2$
Between Treatment	s 33637.13	12	2803.09	5.40	<.001**	.111
Ethnicity	2047.87	1	2047.87	3.94	<.050*	.008
Age	3607.34	5	3607.34	6.95	<.001**	.063
Gender	1642.72	1	1642.72	3.16	<.077	.006
Age x Gender	9775.35	5	1955.07	3.77	<.010**	.035
Error	268473.89	517	519.29			
Total	26764289.00	530				
*p < .05. **p < .01.						

*Table 3:* ANCOVA Summary Table (N = 530)

## DISCUSSION

In this exploratory study, we examined possible systematic changes in the tendency toward selfdirected learning readiness across adolescence and adulthood. The findings support Long's (2000a) claim that there are indeed individual differences in self-directed learning readiness. After statistically controlling for the possible confounding effects of ethnicity, the adolescent and young adult age groups demonstrated the lowest level of self-directed learning readiness, while those in the 30s and 40s exhibited the highest. The oldest participants' scores were not significantly different from the other age groups, supporting the notion that older adults may be as ready to engage in novel learning experiences as those who are younger (Reio & Sanders-Reio, 1999). Further, the age differences were consistent by gender, as *SDLRS* scores generally increased for both males and females until the 50s. There was not an overall gender difference in self-directed learning readiness; however, the gender and age interaction suggested that age 14-20 males in this study were less self-directed than the younger females. The findings that the youngest participants, particularly the males, indicated the lowest level of self-directed learning readiness is consistent with previous research with learning-related variables (e.g., cognitive novelty seeking; Reio & Choi, 2004) and warrants future investigation.

These results provide preliminary evidence for age differences in self-directed learning readiness, and lend tentative support for the notion that self-directedness might have a positive developmental trajectory over the lifespan, i.e., it is possible that self-directedness increases until the 50s, consistent with self-directed learning theory (Long, 2000a; Merriam & Caffarella, 1999). In addition, the findings suggest that this possible developmental trajectory is consistent by gender as well; self-directed learning readiness scores increased significantly for both males and females.

From a maturational/biological perspective, the finding that the two youngest age groups of participants had the lowest *SDLRS* scores is not surprising, inasmuch as self-directed learning readiness might be closely related to certain aspects of executive control functioning (in the frontal cortex) that mature in late adolescence and early adulthood (Goldberg, 2001; Long, 2000b), e.g., metacognition and self-regulation. A promising avenue of research would be to explore individual differences (e.g. age and gender) in how frontal lobe maturation is directly linked to self-directed learning readiness and how situational variables might delay or enhance the development or expression of self-directed learning skill. This new information could be at the forefront of designing new and more effective learning endeavors, particularly for those: (a) with developmental delays due to prenatal exposure to teratogenic environmental agents (e.g., alcohol, cocaine, nitrates), (b) who are recovering from traumatic brain injury (Kolakowsky-Hayner & Kreutzer, 2001) or (c) who might have attentional deficits. To the best of the author's knowledge, attentional deficit disorder (ADD) has not been studied as it relates to self-directed learning readiness, although there is mounting evidence that ADD is linked to frontal lobe size, maturation, and function (Goldberg, 2001; Panksepp, 1998).

As an extension of Candy's (1991) view about the situational nature of self-directed learning, it would be interesting to explore how certain discrete emotions or general moods interact with self-directed learning readiness. Self-directed learning readiness as a personality trait interacts with situational variables, such as one's emotional state, to motivate self-directed learning-related behaviors. Reio (2004) found that one such emotional state, curiosity, mediated the relationship between self-directed learning readiness and classroom learning performance. Anxiety, anger, optimism, hope and many other emotions might influence the expression of self-directedness, but this research has not been currently undertaken.

Systematic investigation of how self-directed learning readiness relates to self-efficacy, selfesteem, self-concept, self-worth, and self-regulation (emotional and cognitive) clearly is needed to further our understanding of the construct and how it is linked to meaningful learning. Additional psychometric studies might identify possible underlying dimensions of self-directed learning readiness (e.g., Field, 1989), which in turn could be connected to similar psychological constructs like self-efficacy to understand best how self-directed learning readiness relates to cognition and emotion.

As Merriam and Caffarella (1999) noted, investigating self-directed learning readiness in the expert/novice paradigm might be a productive new research line. To date, little has been done because of the lack of theoretical support to guide educational research and practice. Alexander (2004), however, has introduced an important new psychological model for viewing the *process* of learning for becoming an academic domain area expert (e.g., biology, history, or chemistry). Knowledge, interest, and strategic processing variables interact situationally across three stages (acclimation, competence, and proficiency-expertise) of this expertise development model. It would be interesting to explore this model as a lens to understand how self-directed learning becomes part of this expertise development process.

As in any study, there are limitations. First, the self-report nature of the Self-Directed Learning Readiness Scale might be problematic as it is a measure of perception, not actual behavior. Because this was an exploratory study and the measure had been used successfully in a number

of previous research studies, it was deemed appropriate to employ the *SDLRS*, but the findings should be applied cautiously to similar research samples only. A possible confounding variable in this research might be socioeconomic status, which was not measured because of logistical issues at the high school and adult education centers. In general, the research suggests that those from lower socioeconomic groups tend to score lower on the *SDLRS* (Brockett, 1985; Merriam & Caffarella, 1999), yet the precise reason is unclear. In future research, it would be useful to design a study specifically addressing the socioeconomic status issue as it relates to and interacts with other individual difference variables. Again, due to logistical constraints, ethnicity was not sufficiently addressed in this study to guide future research because of low participation rates among minority members. Likewise, we had little participation from older adults (i.e., age 50 and above). New research should attempt to methodically increase both minority and older learner participation and avoid the use of convenience samples to increase the generalizability of these results.

The three research samples employed were purposely diverse, perhaps unintentionally interjecting bias into the study, although the method is consistent with previous studies where diverse samples were combined into one large sample for analytic purposes (e.g., Guglielmino et al., 1996). Further, a source of possible bias might relate to the nature of the samples; i.e., one is derived from a "compulsory" (high school) learning environment, while the remaining two are from "self-selected" learning environments. The combination of one's developmental level and his or her decision to pursue a formal learning program (e.g., at an adult education center or through graduate school study) might make that person more likely to score higher on the *SDLRS*. Although this notion merits consideration, this possibility seems less likely because there was not a statistically significant difference between the high school and adult education participants' SDLRS scores in this study; only the dental school participants' scores were significantly higher. It is plausible too that the score differences might be more a function of the dental school participants' prior educational attainment, yet our analyses did not detect statistically significant differences between educational attainment level and self-directed learning readiness.

In summary, evidence has been presented that supports the view that there were individual differences in self-directed learning readiness among the research participants. After controlling for the possible confounding effects of ethnicity, self-directed learning readiness scores increased significantly with each age group until the 50s. This effect was consistent for both males and females. There was not a statistically significant difference overall between male and female SDLRS scores, although young male scores were lower than young female scores. The results strengthen the view that there might be a developmental trajectory in self-directed learning readiness, i.e., it increases across adolescence and adulthood for males and females. Future research will determine the degree to which brain maturation, personality, and situational influences interact to produce this increase.

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# THE RELATIONSHIP BETWEEN SELF-EFFICACY AND AUTONOMOUS LEARNING: THE DEVELOPMENT OF NEW INSTRUMENTATION

# Michael Ponton, Gail Derrick, J. Michael Hall, Nancy Rhea and Paul Carr

#### ABSTRACT

Previous work has shown that cognized goals and outcome expectancies motivate engagement in specific behaviors through the mediating influence of self-efficacy. Autonomous learning represents a specific set of behaviors as measured by intentions to show resourcefulness, initiative, and persistence in one's learning; thus, self-efficacy in autonomous learning should precede a learner's participation in autonomous learning activities. The purpose of the present study was to develop a self-efficacy in autonomous learning instrument thereby enabling future research to test this hypothesized causal relationship. Two pilot studies were conducted in this developmental process: the first pilot study (N = 77) focused on instrument parsimony while the second study (N = 51) was conducted to confirm item homogeneity and internal consistency of the resultant instrument. The results suggest that the final form of the *Appraisal of Learner Autonomy* is both valid and reliable, thereby enabling future research into this psychological factor associated with learner autonomy.

In 1992, Confessore asserted that in order for self-directed learning to lead to a personally satisfying conclusion, the factors of desire, resourcefulness, initiative, and persistence must be manifest. Over the past 5 years, researchers have developed valid instrumentation to assess these factors (Carr, 1999; Derrick, 2001; Meyer, 2001; Ponton, 1999), with continuing levels of refinement (cf. Park & Confessore, 2002), in an attempt to supply the field of self-directed learning with new research-based insights into these aspects of autonomous learning.

Ponton (1999) defined learner autonomy as "the characteristic of the person who independently exhibits agency [i.e., intentional behavior] in learning activities" (pp. 13-14) and stated that autonomy represents a subset of the attributes associated with self-directedness. Ponton suggested that autonomy, like self-directedness, represents cognitive and affective qualities of the agent while autonomous learning refers to subsequent conative manifestations. The term "conative" is used with aspects of autonomous learning because "conation refers to his [sic, i.e., the agent's] behavioral intentions" (Fishbein & Ajzen, 1975, p. 12) and ensuing intentional activity.

A recent path-analytic study conducted by Ponton, Carr, and Derrick (2003), however, concluded that a measure of self-efficacy in autonomous learning was needed "to better describe the relationship between motivation and conation" (p. 13). This recommendation was based upon the lack of context with respect to adult autonomous learning associated with Meyer's (2001) desire measure and the important role of self-efficacy as a predictor of human performance (Bandura & Locke, 2003). Meyer created the *Inventory of Learner Desire* (ILD) as an assessment of the degree to which an agent can act intentionally, independent of any particular contextual manifestation; thus, its explanatory utility within the context of autonomous learning was

questioned (Ponton, Carr, & Derrick, 2003). Contrary to the ILD, the *Inventory of Learner Resourcefulness* (ILR; Carr, 1999), the *Inventory of Learner Initiative* (ILI; Ponton, 1999), and the *Inventory of Learner Persistence* (ILP; Derrick, 2001) were constructed to assess intentions of respective subscales within the domain of adult learning.

Hoban and Sersland (1998) performed a study to determine if a correlation existed between readiness for self-directed learning (assessed via the *Self-Directed Learning Readiness Survey*) and self-efficacy for self-directed learning. As part of this investigation, the 10-item *Self-Efficacy for Self-Directed Learning Questionnaire* (SSLQ) was developed. A statistically significant correlation was found (r = 0.49, N = 86, p < .001) between the two measures for a sample of students who were tested at the beginning of their teacher credentialing program. This research suggested that self-efficacy is an important construct in understanding a student's readiness for self-directed learning.

For the purposes of investigations on the larger population of adult learners, however, the SSLQ is inadequate due to items that are expressly related to structured education. References to "teacher" (item 2, Hoban & Sersland, 1998, p. 17), "fellow students" (item 4, p. 17), "student directed cooperative groups" (item 6, p. 17), "instructional videotapes" (item 8, p. 18), and "graduate courses" (item 10, p. 18) suggest that the SSLQ's validity is related to its use on adults participating in formal graduate education. However, the concept of autonomous learning as an agentive activity is not limited to students participating in educational programs. While such students certainly can exhibit autonomy in their learning, other adults may do so as well. Thus, a new instrument was required to measure self-efficacy within the construct of autonomous learning.

The purpose of the present study was to develop an instrument to measure self-efficacy in autonomous learning. Such an instrument would use the guidelines presented by Bandura (2001) in developing self-efficacy scales and testing would be performed to support validity and reliability. The hypothesized role of self-efficacy with autonomous learning will be presented along with results from the instrument development activity.

# CONCEPTUAL FRAMEWORK

Fishbein and Ajzen (1975) provided a simple model relating beliefs, attitudes, intentions, and behaviors. They described beliefs as a cognitive process in which objects are assigned attributes that provide a discrimination function; that is, cognition is one's knowledge. Attitudes are a learned affection of favor or disfavor with respect to different objects based upon the discriminating attributes where such attitudes may influence (in addition to being influenced by) beliefs. Attitudes toward objects then influence the intentions of the agent and subsequent behaviors where the consequences of behaviors provide feedback to one's belief system. This model is presented in Figure 1.

Figure 1. The model of Fishbein and Ajzen (1975).



Based upon past research, Bandura (1997) summarizes the mediating influence of self-efficacy on cognitive motivation. An agent will not engage in performances and adopt performance goals that are thought to lead to desirable outcomes unless the agent feels efficacious in effecting a successful performance (cf. Ponton, Edmister, Ukeiley, & Seiner, 2001). People do not engage in perceived futile endeavors but rather choose activities that they feel will lead to satisfying ends. Through self-reflection, people process different sources of efficacy information (i.e., mastery experiences, vicarious experiences, verbal persuasion, and physiological/emotive arousals) and form beliefs about their level of capability in diverse arenas. Using this knowledge, favorable or unfavorable attitudes toward engagement in select behaviors are developed that influence activity choice. Thus, self-efficacy precedes conation.

Self-efficacy is a domain specific assessment. One's perception of capability in turning on a light switch is typically much different than an assessment of capability in running a 4-minute mile. Therefore, assessments of efficacy must be contextualized to the activity of interest. The context of autonomous learning is no different. If one believes that engagement in autonomous learning activities will lead to desirable outcomes and feels capable of successfully doing such learning, then it should be expected that self-efficacy in autonomous learning should precede such learning.

As previously mentioned Meyer's (2001) instrument of desire is not contextualized to adult autonomous learning but rather is an assessment of an adult's ability to exert influence over his or her life by considering the three subscales of freedom, power, and change. Her instrument represents "an attempt to measure the degree to which an agent can act intentionally" (Ponton, Carr, & Derrick, 2003, p. 2) or as Park and Confessore (2002) asserted, "[Meyer's] work on desire to learn has been treated as an effort to understand the *precursors* to the development of intentions related to learning" (p. 289). Unfortunately, without a behavioral context, one's general belief concerning the ability to act intentionally will probably provide little explanatory utility in understanding specific conative manifestations such as autonomous learning. If autonomous learning is determined by a summation of the ILR, ILI, and ILP and using the presented arguments of context, it is hypothesized that the largest effect on autonomous learning will be through the path

Desire  $\rightarrow$  Self-Efficacy in Autonomous Learning  $\rightarrow$  Autonomous Learning

where self-efficacy should mediate the influence of desire on autonomous learning. Because of the past lack of suitable self-efficacy instrumentation, research on testing the hypothesized path analytic model represents future work.

#### DEVELOPMENT OF THE APPRAISAL OF LEARNER AUTONOMY

#### First Pilot Study

The *Appraisal of Learner Autonomy* (ALA; Appendix A) was constructed using the ideas presented by Bandura (2001) and modeled after the *Exercise Self-Efficacy* Scale (ESS) (Bandura, 2001, p. 11) by permission (Bandura, personal communication, October 6, 2003). As per Bandura's (2001) guidelines, the title of the ALA does not include "self-efficacy" to avoid response bias (Bandura, p. 6), the scale is in gradations of "can do" to reflect a measure of capability (Bandura, p. 4), the scale ranges from 0-100 to improve predictive utility (Pajares, Hartley, & Valiante, 2001), the text is domain specific to autonomous learning to improve both predictive and explanatory utility within this construct (Bandura, p. 1), and the items represent performance impediments to maximize discrimination between respondents (Bandura, p. 3).

The introductory statement in the ALA reads:

...please rate how sure you are that you can get yourself to participate in a learning activity when nobody else requires you to do so. Note that a learning activity is <u>any</u> [emphasis in original] activity that you believe will help you to learn something that you want to learn. (Appendix A,  $\P$  1)

This statement reflects the position of Ponton, Carr, and Confessore (2000) that autonomous learning is an agentive activity where agency refers to behavior that is intentional and based upon a multitude of sociocognitive determinants. Self-efficacy is asserted to be relevant to autonomous learning as manifest agency because "perceived self-efficacy is an important part of that constellation of unmeasured determinants of performance" (Bandura & Locke, 2003, p. 91).

Social cognitive theory posits the existence of three types of barriers to agency: cognitive (i.e., self-inefficacy), situational (i.e., temporary), and structural (i.e., inadequate resources) (Bandura, 1997); however, in general, the items presented in the ESS scale include situational impediments applicable to any type of adult activity. The original 21-item version of the ALA (Appendix A) included 20 items directly associated with the complete ESS that were either (a) taken verbatim (ALA items 1-3, 7, 8, 11-15, 19, and 21), (b) contextualized to learning as opposed to exercise (ALA items 4, 9, and 10), (c) separated to avoid double-barreled items (ALA items 5, 6, 17, 18), or (d) rewritten slightly (ALA item 16). Only ALA item 20 is new and reflects a structural barrier (i.e., monetary cost) as suggested by Darkenwald and Valentine (1985) as a deterrent to adult learning.

Bandura (2001) argues that self-efficacy scales are face valid; however, research directed at establishing predictive validity (e.g., future work with self-efficacy and autonomous learning) help support a scale's validity. Bandura suggests the use of factor analysis to determine item homogeneity (i.e., content validity) and Cronbach's alpha coefficient as a measure of internal consistency (i.e., reliability). A pilot test was performed on the original 21 items to determine a resultant instrument for the present study.

The first pilot group consisted of 77 participants selected (i.e., several convenience samples) from Regent University (n = 51) and Arkansas State University at Jonesboro (n = 26). With respect to the Regent University participants, some participants were staff members and not all student participants were from a given academic discipline (approximately 60% of the participants were students studying in the library and thus unknown to the researchers). All Arkansas State University participants were in-service teachers. The demographics of this pilot group are presented in Table 1 where the majority of the participants were female (P = 65%), White (P = 84%), and had a bachelor's degree (P = 56%). The average age of this pilot group was 34.96 years (SD = 12.13) and ranged from 21 to 63.

Table 1.

phics				
n				
27				
50				
65				
7				
2				
3				
Highest Educational Attainment				
14				
43				
20				

Descriptive statistics for each of the original 21 items are presented in Table 2. Because no item means are 100 (i.e., "certain can do"), it can be asserted that the ESS impediments represent obstacles within the context of adult autonomous learning. Because homogeneity of items is hypothesized to exist, principal component analysis was performed to uncover uncorrelated common factors that account for a maximum amount of variance in the subgroup of items (Dunteman, 1989) where the first principal component represents the best condensation of the variables (Gorsuch, 1983). However, because the principal component analysis was performed on the correlation matrix and because parsimony was desired, items of non-normal character were identified for removal using the Kolmogorov-Smirnov Z (K-S Z) goodness-of-fit test. Because the score for each participant will be the summation of all items, the negative implications of committing a Type I error for each item's respective K-S Z test were assumed to be minimal; therefore, the K-S Z test of normality was based on  $\alpha = 0.1$ . The results (see Table 2) suggest that items 1, 2, 4, 5, 7, 14, 15, 16, and 19 may be assumed to follow a normal distribution. The resultant 9-item ALA is presented in Appendix B.

Because principal component analysis was performed on the correlation matrix, results may be dependent upon sampling variability (Kim & Mueller, 1978). According to Kline (1993), a minimum subject-to-item ratio necessary for good factor analysis is 2:1 (p. 121) although he

states that there are large disagreements among researchers concerning this ratio. However, because the pilot group sample size to item number was approximately 9:1 (i.e., 77:9), the sample size was assumed to be sufficient for principal component analysis.

Table 2.	
Descriptive Statistics and Kolmogorov-Smirnov Z Test of the Original 21 Iter	ms
for Pilot Group 1	

Item	М	SD	Skewness	Kurtosis	K-S Z	р
1	62.16	24.01	-0.36	-0.43	0.997	0.274
2	66.14	24.96	-0.50	-0.62	0.994	0.277
3	81.94	18.71	-1.12	0.71	1.748	0.004*
4	66.56	24.55	-0.54	-0.45	1.017	0.252
5	58.56	25.64	-0.38	-0.44	0.885	0.413
6	74.69	20.50	-0.95	0.68	1.638	0.009*
7	58.51	26.77	-0.36	-0.61	1.173	0.127
8	65.55	25.55	-0.81	-0.04	1.462	0.028*
9	72.47	21.88	-0.80	0.20	1.258	0.084*
10	57.78	26.86	-0.47	-0.84	1.483	0.025*
11	57.22	32.43	-0.33	-1.17	1.288	0.073*
12	78.52	22.95	-1.23	0.87	1.738	0.005*
13	67.04	22.65	-0.76	0.06	1.500	0.022*
14	57.45	28.68	-0.53	-0.68	1.165	0.132
15	65.00	24.51	-0.77	0.08	1.222	0.101
16	68.05	23.97	-0.44	-0.61	1.163	0.134
17	72.99	25.73	-1.03	0.45	1.569	0.015*
18	80.78	21.21	-1.50	2.38	1.646	0.009*
19	64.35	24.98	-0.47	-0.46	1.203	0.111
20	77.99	22.28	-1.37	1.86	1.626	0.010*
21	68.68	23.67	-0.72	-0.21	1.422	0.031*

*Note.* Skewness SE = 0.27; kurtosis SE = 0.54. K-S Z refers to the Kolmogorov-Smirnov Z test with associated *p*-values. \*p < 0.1.

Table 3 presents the results of the principal component analysis performed on the nine items where normality was assumed. (Note that the item numbers in Table 3 correspond to the 21-item instrument presented in Appendix A and not the reduced 9-item instrument presented in Appendix B.) The Bartlett Test of Sphericity and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) were used to assess the suitability of the correlation matrix for factor analysis. For factor analysis, the MSA index should be greater than 0.5 (Cureton & D'Agostino, 1983, p. 389) and Bartlett's  $\chi^2$  should have a low *p*-value thereby enabling a rejection of the null hypothesis of no difference between the correlation matrix and the identity matrix (Norusis, 1988). As presented in Table 3, MSA = 0.84 and Bartlett's  $\chi^2(36, N = 77) = 322.98$  with p < 0.001; thus, the pilot group sample was assumed adequate for principal component analysis. Gorsuch (1983) indicates that a minimum factor loading level of 0.3 (p. 210) is popularly used to

define a salient loading. The results presented in Table 3 indicate that all nine items load above this criterion (minimum loading is 0.546) thereby supporting item homogeneity.

Table 3.
Principal Component Analysis of the Reduced
9-Item Instrument for Pilot Group 1

Item	Factor Loading	
1	0.817	
2	0.761	
4	0.546	
5	0.810	
7	0.814	
14	0.644	
15	0.713	
16	0.633	
19	0.728	

*Note.* Only one component extracted explaining 52.43% of the total variance. Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) = 0.84; Bartlett's Test of Sphericity approximate  $\chi^2(36, N = 77) = 322.98, p < 0.001$ .

As suggested by Bandura (2001), Cronbach's alpha coefficient was computed to assess internal consistency. Kline (1993) suggests that alpha should be high at around 0.9 but not less than 0.7 (p. 11). Using the pilot group data, Cronbach's alpha was computed to equal 0.88 for the nine items associated with Table 3.

Based upon an analysis of the results of the pilot study, the ALA was reduced to nine items. These items were found to be homogeneous via principal component analysis and internally consistent via Cronbach's alpha coefficient thereby supporting content validity and internal reliability, respectively. The resultant items are presented in Appendix B and were used for a second pilot study.

# Second Pilot Study

A second pilot study was conducted using the 9-item version of the ALA. Fifty one graduate students attending Regent University participated in the second study. The purpose of this second study was to determine if the observed item homogeneity and internal consistency found in the first pilot study was present when the shortened ALA was used.

The 9-item ALA (Appendix B) was sent to all graduate students (approximately 500) attending programs in Regent University's School of Education (see Table 4). The majority of the second pilot group was female (P = 80%), white (P = 69%), and had a graduate degree (P = 69%).

The descriptive statistics for the second pilot study are presented in Table 5. Note that item numbers 1 through 9 (Appendix B) correspond to item numbers 1, 2, 4, 5, 7, 14, 15, 16, and 19

(Appendix A), respectively. Comparing Table 5 to Table 2, the means for all nine items for pilot group 2 was larger than for pilot group 1. Because parsimony was not a goal of the second pilot study, item reduction via normality analysis was not performed.

Table 4.	
<u>Pilot Group 2 (<math>N = 51</math>) Demogra</u>	phics
Variable	n
Gender	
Male	10
Female	41
Racial/Ethnic Group	
White	35
Black	13
Hispanic	1
Other	2
Highest Educational Attainment	
High School Diploma	0
Bachelor's Degree	16
Graduate Degree	35

Table 5.Descriptive Statistics for the 9-ItemALA from Pilot Group 2

Item	М	SD	
1	70.35	21.76	
2	76.27	18.70	
3	72.37	19.83	
4	72.67	20.21	
5	67.74	21.66	
6	65.39	24.37	
7	79.31	18.52	
8	75.96	20.79	
9	71.18	22.13	

The results of the principal component analysis are presented in Table 6. For this analysis, MSA = 0.76 and Bartlett's  $\chi^2(36, N = 51) = 217.38$  with p < 0.001; thus, the second pilot group sample was assumed adequate for principal component analysis (Cureton & D'Agostino, 1983, p. 389; Norusis, 1988). According to the 0.3 criterion of Gorsuch (1983), all nine items have salient factor loadings; thus, items homogeneity is tenable. Cronbach's alpha coefficient was computed to equal 0.86 for the second pilot group; thus, internal consistency is supported as well.

Table 6.
Principal Component Analysis of the 9-Item ALA
for Pilot Group 2

Item	Factor Loading	
1	0.707	
2	0.734	
3	0.656	
4	0.797	
5	0.775	
6	0.623	
7	0.765	
8	0.490	
9	0.718	

Note. First component explaining 49.28% of the total variance.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) = 0.76;

Bartlett's Test of Sphericity approximate  $\chi^2(36, N = 51) = 217.38, p < 0.001.$ 

#### CONCLUSION

Based upon two pilot studies, the 9-item *Appraisal of Learner Autonomy* appears to be a valid and internally reliable instrument. Further research can now be undertaken in conjunction with the *Learner Autonomy Profile* to determine the tenability of the hypothesized causal relationship that self-efficacy mediates the influence of desire on the conative manifestations of resourcefulness, initiative, and persistence in autonomous learning. Support for this model will provide a greater level of understanding into methods of fostering learner autonomy via the sources of efficacy information.

The present investigation was performed as a logical next step in ongoing research to understand the psychological aspects of autonomous learning. Without adequate instrumentation, conjectures will not lead to tenable theories that support future empiricism into uncovering viable methods of empowering agents to further achievement. Self-efficacy has been argued to mediate all forms of cognitive motivation; thus, a research-based understanding as to its role in autonomous learning is essential if we are to continue to move forward in developing lifelong learners.

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(0, 100)

#### APPENDIX A

Appraisal of Learner Autonomy [Pilot Group Version]

In responding to the items below, insert any score (0-100) using the following scale:

0	10	20	30	40	50	60	70	80	90	100
Cannot	Moderately									Certain
do at all	certain can do								can do	

In each of the following situations, please rate how sure you are that you can get yourself to participate in a learning activity when nobody else requires you to do so. Note that a learning activity is <u>any</u> activity that you believe will help you to learn something that you want to learn.

1.	When I am feeling tired	(0 100)
2.	When I am feeling under pressure from work	
3.	During bad weather	
4.	After recovering from an injury that interrupted my learning	
5.	When I am experiencing personal problems	
6.	After I have experienced personal problems	
7.	When I am feeling depressed	
8.	When I am feeling anxious	
9.	After recovering from an illness that interrupted my learning	
10.	When I feel physical discomfort during my learning activity	
11.	During a vacation	
12.	After a vacation	
13.	When I have too much work to do at home	
14.	When visitors are present	
15.	When there are other interesting things to do	
16.	When I am not getting near my learning goals	
17.	Without support from my family	
18.	Without support from my friends	
19.	When I have other time commitments	
20.	When I have a limited amount of money	
21.	After experiencing family problems	

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(0.100)

## APPENDIX B Appraisal of Learner Autonomy [Final Version]

In responding to the items below, insert any score (0-100) using the following scale:

0	10	20	30	40	50	60	70	80	90	100
Cannot	Moderately								Certain	
do at all	certain can do							can do		

In each of the following situations, please rate how sure you are that you can get yourself to participate in a learning activity when nobody else requires you to do so. Note that a learning activity is <u>any</u> activity that you believe will help you to learn something that you want to learn.

		(0-100)
1.	When I am feeling tired	
2.	When I am feeling under pressure from work	
3.	After recovering from an injury that interrupted my learning	
4.	When I am experiencing personal problems	
5.	When I am feeling depressed	
6.	When visitors are present	
7.	When there are other interesting things to do	
8.	When I am not getting near my learning goals	
9.	When I have other time commitments	

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# A PRELIMINARY ANALYSIS OF LEARNER AUTONOMY IN ONLINE AND FACE-TO-FACE SETTINGS

# M. Gail Derrick, Michael K. Ponton, and Paul B. Carr

#### ABSTRACT

The research of Ponton (1999), Carr (1999), and Derrick (2001), established a definitive understanding of the specific characteristics associated with initiative, resourcefulness, and persistence in autonomous learning. This framework provides a quantitative measure of specific behaviors associated with autonomous learning; that is, those behaviors that are self-directed, self-regulating, and independent. The purpose of this study was to examine what, if any, differences exist in learner autonomy with doctoral students engaged in either online instruction or face-to-face instruction. Learner autonomy was assessed using the Learner Autonomy Profile (LAP). The purpose of this paper is to present the findings from the study and discuss implications for course structure and pedagogy.

In order to develop lifelong and autonomous learning behaviors, it is important to understand the relationship of learning theories in conjunction with education practices and course design, particularly with online learning. Course design and delivery, regardless of the setting, should provide opportunities to develop initiative, resourcefulness, and persistence in learning (Derrick & Pilling-Cormick, 2003). This is of particular importance for students seeking a doctoral degree. The ability to successfully engage in rigorous, independent research and study is a primary objective for obtaining a doctoral degree. The very nature of the degree implies that the successful graduate is able to think, act, and perform in a particular manner and demonstrate specific attributes and qualities. The primary attribute is associated with independent thinking and scholarship.

The generation and availability of information obtainable through technology and the worldwide web continues to have profound implications for teaching and learning. Knowledge is no longer a finite constant to be transmitted in an incremental and hierarchal method but an exploding evolution. Information and knowledge are growing an exponential rate with new information generated more rapidly than ever and even more quickly becoming obsolete. The implications for educators suggest we rethink what knowledge is essential and what requisite skills and attributes for learning are needed for today and the future. The focus of education requires an emphasis on *knowing how to learn*.

The teaching and learning focus must change, placing less emphasis on the answer and more emphasis on learners who are able to work independently and autonomously. Greater emphasis on the learner and the structures and mechanisms that sustain and develop the qualities and attitudes required for the future are necessary. The shift in thinking has focused on the internal conditions (attitudes and beliefs) that are necessary for sustained and enduring learning rather than the external surroundings and settings. The educational process should equip students with the attributes and skills for independent learning so that the learner becomes the teacher and the teacher the learner.

# LITERATURE REVIEW

The early research in lifelong learning examined the external conditions and settings under which the learning occurred. During the 1960's, research focused on how and why adults engage in learning activities. Houle (1961) prepared a series of lectures on what kinds of men and women retain alert and inquiring minds throughout their lifespan. He classified learners into three subgroups; goal-oriented--those that were engaged in the learning due to an external requirement or need; activity-oriented--those that were engaged in the learning because of the social aspects associated with the endeavor; and learning-oriented--those that were curious and enjoyed learning. This work was followed by a nationwide study, undertaken by Johnstone and Rivera (1965), who determined that "self-learning" activities comprised a major part of the learning that was being undertaken by adults in the United States.

Tough (1979) built on Houle's earlier work by focusing on the behavior of adults while planning their learning projects. He found that 20 percent of adult learning was planned and organized by someone other than the learner, while 80 percent was self-planned and self-guided. Tough's research became the basis for numerous studies that verified the existence of self-learning, and exposed the prevalence and pervasiveness of self-planned and executed learning activities.

Houle (1961) writes, "Effort to explore the reasons why some people become continuing learners has made it clear that there is no simple answer to this complex question. Each person is unique and his [or her] actions spring from a highly individualized and complex interaction of personal and social factors" (p. 80). According to Houle (1961) behind any decision to learn something new lies a complex network of motives, interests, and values, and behind them, yet another layer of complex inter-linked factors; "a cataract of consequences" (p. 29). If the goal is to produce lifelong learners, then we must provide opportunities that foster autonomous learning endeavors—that is, facilitate the development of resourcefulness, initiative, and persistence in any learning, formal or other learning. We learn due to a gap of where we are and where we want to be. The key is to make the learning the intrinsic motivator despite external requirements or conditions.

## Autonomous Learning

Confessore (1992) stated "self-directed [autonomous] learning manifests itself in people who feel a need to learn something" (p.3). He additionally asserts that success is ultimately dependent upon the individual's personal desire, initiative, resourcefulness, and persistence. Confessore's (1992) research was critical in establishing support for the factors associated with autonomous learning and ultimately provided a framework for development of the individual inventories that comprise the Learner Autonomy Profile (LAP).

Autonomous learning is regarded as a behavioral syndrome of co-occurring behaviors (i.e., desire, resourcefulness, initiative, and persistence). Each factor assesses specific attributes and provides both individual factor as well as an overall score of learner autonomy. Ponton (1999) developed the Inventory of Learner Initiative (ILI), Carr (1999) developed the Inventory of Learner Persistence

(ILP), and Meyer (2001) developed the Inventory of Learner Desire (ILD). These individual instruments produced a single valid and reliable instrument, the Learner Autonomy Profile (LAP).

## Desire in Autonomous Learning

Meyer (2001) defines desire as the ability of the learner to exercise influence in their personal life through the processes associated with freedom, power, and change. Meyer's instrument is not contextualized to learning and is viewed as a precursor to learning. Meyer (2001) attempts to measure the degree to which an agent (individual) can act intentionally.

## Initiative in Autonomous Learning

Ponton (1999) defines initiative as a behavioral syndrome of five co-occurring behaviors: goaldirectedness, action-orientation, active-approach to problem solving, persistence in overcoming obstacles, and self-startedness. Ponton's research describes the importance of establishing goals and working towards the accomplishment of those goals; how quickly an individual transfers the intention to engage in some learning activity into action; the role of self-motivation; assuming the responsibility for finding solutions to barriers or obstacles that may occur in learning; and sustained action despite the presence of obstacles. This implies that the learner must be able to quickly begin the action of learning through the establishment of learning goal, find adequate solutions to problems, and be able to motivate one's self.

# Resourcefulness in Autonomous Learning

Carr (1999) identified the behaviors of learner resourcefulness as anticipating future rewards of learning, prioritizing learning over other activities, choosing learning over other activities, and solving one's problems in learning. The resourceful learner is able to recognize the anticipated future value of the learning, keep the learning a priority despite other goals or obstacles, postpone activities that may be exciting or fun for the future value of the learning, and solve problems related to the learning endeavor.

## Persistence in Autonomous Learning

Derrick (2001) asserts that persistence in a learning endeavor is the volitional behavior that enables the individual to sustain the effort and perseverance necessary to remain focused on the achievement of a goal, despite obstacles, distractions, and competing goals. Derrick (2001) posits that the factors associated with persistence in autonomous learning are volition, self-regulation, and goal-maintenance.

Volition is the strength of the desire or reason for and against acting upon the desire to learn. Volitional control is the commitment to a goal and is attained by the regulation of self. Self-regulation of those enduring behaviors necessary for goal attainment is contingent upon volition. The strength of the desire for acting in a particular way influences the level of volition required to self-regulate the behavior. Individuals persist with learning that is challenging through regulation of cognitive and behavioral processes.

# BACKGROUND

Regent University is located in Virginia Beach, Virginia and is primarily a graduate institution. There are approximately 180 doctoral students enrolled in the School of Education. The method of delivery is primarily via distance learning using a Blackboard platform although there are newly formed cohorts that spend the first year of instruction in a face-to-face setting or a hybrid setting. Online students are located throughout the world although many are within driving distance of the main campus. The current face-to-face cohort is a hybrid model that includes the first year of coursework in residential instruction and the remainder of coursework via distance instruction. The rationale for this model is that most of the students are only familiar with a traditional setting for instruction and the hybrid model is viewed as a bridge between traditional instruction and preparation for distance instruction.

Students in the doctoral program begin their initial coursework with a research course the first semester and an educational statistics course the second semester. These courses are viewed by many students with trepidation and fear, and as a barrier to successful completion of the degree. Students are primarily public K-12 educators knowledgeable with curriculum and instructional issues; however, have limited experience using and analyzing data.

The design and pedagogy of courses both online and in face-to-face settings often fails to fully articulate what the student should be able to do and demonstrate to the larger learning continuum. Specific content skills are assessed; however, this in and of itself is not sufficient for preparation for independent scholarship and research. It is not enough to state the difference between a quasi experimental design and true experimental design but to apply and evaluate that content in different contexts and research scenarios. Knowing a specific fact(s) is not the same as using information, nor does it indicate that a learner possesses the prerequisite attitudes and attributes to continuously and independently engage in learning through the lifespan. The investigators in this study carefully constructed the doctoral research course in the face-to-face and online delivery to assess the same content skills and thinking but also to provide opportunities that foster and develop autonomous learning behaviors.

# THE RESEARCH STUDY

The doctoral research course was taught by the same professor for both online and face-to-face delivery and structured to deliver and assess the same general competencies. Assignments for the course were specific but designed with the delivery mode (online or face-to-face) as an important consideration. Often, a major impediment for learning is the lack of consideration for the pedagogical structure of online and/or face-to-face courses. Each delivery method (online or face-to-face) was designed to achieve the same competencies; however, the course design and pedagogy was adapted to the delivery method. The course has specific content goals in concert with the goal for development of autonomous learning behaviors.

The attributes and qualities of learner autonomy include desire, resourcefulness, initiative, and persistence in learning. These qualities are manifested in learners who can <u>independently</u> do the following:

1. Choose a topic of interest

- 2. Learn about the topic
- 3. Evaluate the adequacy of the learned material
- 4. Evaluate the adequacy of the learning
- 5. Synthesize learned material from different (and perhaps conflicting) sources and data types (i.e. statistics and theories)
- 6. Organize, in writing, the learned ideas in a logical, coherent, and organized manner
- 7. Develop and defend both orally and in writing, a presentation of the learned ideas.

The online and face-to-face research courses were designed to provide opportunities for students to work towards these larger goals. For example, students in the face-to-face instruction were provided opportunities to work collaboratively in groups while students in the distance courses worked independently in similar assignments. The purpose was to have the face-to-face students work towards a learning goal, provide feedback, and evaluate the material and the learning, but in a collaborative setting. The distance students were in a more structured and prescriptive setting to work towards self-regulation and management of a learning goal, feedback via dialogue, self-evaluation of the content and self-evaluation of the learning.

Current doctoral students enrolled in the research course either online or in a face-to-face setting were asked to register and complete the Learner Autonomy Profile (LAP) at the beginning of the semester and at the end of the course. The LAP also collects demographic information such as gender, age, marital status, and educational level. These variables have been previously considered as possible influences on learner autonomy. The Learner Autonomy Profile assesses a learner's intentions with regard to desire, resourcefulness, initiative and persistence in learning. The LAP consists of four inventories that assess specific attributes of learner autonomy including the Inventory of Learner Desire (ILD) (33 items), the Inventory of Learner Resourcefulness (ILR) (53 items), the Inventory of Learner Initiative (ILI) (44 items), and the Inventory of Learner Persistence (ILP) (34 items). Each item is scored using a Likert Scale that ranges from 0 to 10 with 0 representing "Never" and 10 representing "Always." Table 1 presents the demographic information of online doctoral students (N=27) who completed the LAP at the beginning of the semester. These students have only had online instruction.

11	
6	
21	
13	
14	
-	6 21 13 14

Note: (*N*=27)

Descriptive statistics indicate that the group is 22% male and 78% female. The marital status for the group is 48% single and 52% married. The ages range from 27 to 59 with a mean age of 44 and a median age of 45. The group is primarily female, married and approximately 44 years of age. A comparison of the 18 face-to-face students indicates the demographics are very similar to online demographics (see table 2).

<i>Table 2.</i> Face-to-Face Doctoral Students Demographics					
Variable	п				
Gender					
Male	5				
Female	13				
Marital Status					
Single	6				
Married	12				

Note: (N=18)

Descriptive statistics indicate that this group is 28 % male and 72% female. The marital status is 33 % single and 67% married. The ages range from 26 to 59 with a mean age of 43 and a median age of 44. The groups are very similar with regard to the demographics. The group is primarily female, married, approximately 43 years of age.

The four factors assessed by the Learner Autonomy Profile are desire, resourcefulness, initiative, and persistence. The results of each factor and the total LAP scores are presented in Table 3.

Table 3. Mean	Factor and	Total LAP S	Scores Online	<b>Doctoral Students</b>
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Desire *	Resourcefulness*	Initiative*	Persistence*	LAP Total
263.42	429.36	351.38	289.75	1070.50

Note: (N=27) \* represents the total mean score for each factor.

An analysis of the data from students who are students enrolled in face-to-face instruction provide the following results with regard to the individual factors and overall mean LAP score (see Table 4).

Table 4. Mean Factor and Total Lap Scores of Face-to-Face Doctoral Students

Desire*	Resourcefulness*	Initiative*	Persistence*	LAP Total	
264.45	425.52	345.87	284.00	1055.40	

Note: (N=18) \* represents the total mean score for each factor.

The results indicate a lower overall mean LAP score for face-to face doctoral students as compared to online doctoral students. Note, the desire mean was slightly higher but not significantly.

Additional analysis included a pre and post LAP score analysis to determine if significant changes in learner autonomy occurred as a result of the delivery method. Since learner autonomy is viewed as a developmental process, it was expected that some changes would have occurred as a result of course design in both online and face-to-face settings. Students completed the LAP in the beginning of their research coursework and at the end of the course. There were not sufficient cases to conduct a t-test analysis and reported results are limited to mean scores only of those in each group who completed both a pre and post LAP. The results are presented in Table 5 and Table 6.

Table 5. Mean LAP Score of Online Students Who Completed Pre/Post LAP

Desire*	Resourcefulness*	Initiative*	Persistence*	LAP Total
266.37	423.12	343.25	280.64	1047.02

Note: (N=12) \* represents the total mean score for each factor.

Desire*	Resourcefulness*	Initiative*	Persistence*	LAP Total
258.75	400.37	329.083	271.70	1001.16

Table 6. Mean LAP Score of Face-to-Face Students Who Completed Pre/Post LAP

Note: (N=6) \* represents the total mean score for each factor.

It was interesting to note that the online students overall had a higher level of autonomy across each factor and with the total LAP score. The limitations of the study are the inequality of groups and the limited number of respondents. It is expected that future data will yield more authoritative information that allow the researchers to draw conclusions from the data.

The researchers were not able to collect adequate pre and post test LAP scores from both groups for any definitive recommendations. The research into facilitating autonomous learning behavior in online and face-to-face setting will continue to be explored with regard to the structure and pedagogy of the courses. The focus is to provide learning opportunities that enhance efficacy and autonomous learning behaviors that will lead to successful goal attainment.

It is interesting to note that although there is limited paired LAP data for both groups, the students who did complete the pre and post LAP had overall lower mean scores than the larger sample groups. This could indicate several issues, a major concern being that learner autonomy decreased in both groups as indicated by the pre and post results. More research is needed with a larger sample in order to make definitive statements about the stability of autonomous learning over time.
The differences in learner autonomy were evident in the mean factor scores and the total LAP scores. The face-to-face cohort members were viewed as traditional learners and expected more of a teaching mode of instruction. It could be that independent learners self-select to learn in the online environment knowing that more self-regulation is necessary for success. The course pedagogy will continue to be refined and restructured as we gain more insight into developing autonomous learning in different mediums and settings.

#### CONCLUSION

Although the data were not sufficient in numbers to make a definitive statement, it did provide information that was confirming in some regards. As professors in the doctoral program, it was generally felt that online students were more independent in their learning orientation from the onset of the program, while face-to-face students needed more facilitation in their development of autonomous learning behaviors. It was generally considered by the faculty that students are aware of how they learn best and self-select the appropriate setting. All of the students are excellent students; this is evident by their very admittance to a doctoral program. However, many had not had the opportunity to exhibit any form of independence in their learning. The idea that autonomous learning is a developmental process becomes important in course design. Once given the opportunity and freedom to learn in this manner, it is almost impossible to go back to the traditional ways of learning.

In order to inspire or motivate students for lifelong learning, we must equip them with the necessary internal skills for lifelong and independent learning. Our goal is for them not to need us any longer than absolutely necessary. If educators were able to understand their personal levels of autonomy related to resourcefulness, initiative, and persistence, a belief regarding what they learn, how they learn, and their ability to learn in any environment or setting would greatly enhance their views and attitudes towards learning. We must facilitate their movement to a posture that it is not about the answer; it is about finding the answer independently with a high degree of belief regarding their abilities for future learning. Once learners are able to understand their own capacities with learning, any learning, they are fundamentally changed with regard to their personal view of their capabilities and competence. The learning reinforces beliefs and efficacious behaviors for lifelong and sustained learning (Derrick, Ponton, & Carr, 2003). Learning is the intrinsic motivator and serves to enhance one's self-efficacy for future learning. Learning is the reward.

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# COMMON BARRIERS, INTERRUPTERS AND RESTARTERS IN THE LEARNING PROJECTS OF SELF-DIRECTED ADULT LEARNERS

# Lucy Madsen Guglielmino, Darwin Asper, Brian Findley, Charles Lunceford, Robert Steve McVey, Steven Payne, Gerri Penney, and Leatrice Phares

# ABSTRACT

This study examines in depth the learning projects of a purposeful sample of 14 individuals perceived to be highly self-directed learners. After responding to the *Self-Directed Learning Readiness Scale (Learning Preference Assessment)*, the subjects were interviewed using a modification of Tough's interview protocol. The major modification of interest to this paper was the addition of open-ended questions designed to explore barriers to the pursuit of adults' learning projects and causes for the restarting of interrupted learning projects. Quantitative data, including SDLRS scores and numbers of learning projects were calculated. Common themes in the responses to the open-ended questions related to the barriers and restarters were identified.

Self-direction in adult learning has been a topic of increasing interest and investigation by scholars and practitioners of adult education since the mid-1900's. It has been represented in a variety of terms such as self-education, andragogy, self-directed learning, independent study, autonomous learning, self-planned learning, adults' learning projects, independent study, lifelong learning and autodidacticism, but each emphasizes the self-imposed responsibility of the individual learner in the learning process.

In 1961, Houle's qualitative analysis of the continuing learning of adults ignited a growing interest in and examination of self-directed learning. *The Inquiring Mind* began a major new stream in adult education research near the same time period in which books such as Toffler's *Future Shock* (1971) and *Learning for Tomorrow* (1974) began to implant in the national consciousness that the rapidly increasing pace of change was altering our world at an unprecedented rate, and that our educational systems were not responding adequately to the new challenges. In a 1988 afterword to a reprint of his book, Houle acknowledges that explorations of "self-directed study, in which an individual or group accepts responsibility for designing and pursuing an educative activity" comprise the best-known sequence of investigations flowing from his 1960's research (p. 92).

Johnstone and Rivera's (1965) reporting of a major quantitative study of participation also provided an impetus for research in sdl. Their data, gathered in 1961 and 1962 in an unprompted survey, indicated that 8% of the adults sampled reported they were involved in at least one major self-education project. Johnstone and Rivera's conclusion that self-instruction was probably the most overlooked activity in adult education was also an invitation to researchers.

Tough (1971, 1978, 1979), a student of Houle's at the University of Chicago, examined some of the transcripts on which *The Inquiring Mind* was based as he formulated his detailed research on adults' learning projects. Tough developed an interview schedule to collect information on the number and duration of learning projects conducted by adults, their reasons for learning, the methods of learning and types of resources used, and who the primary planners of the learning

were. The findings of his investigation and 10 others conducted using the same interview protocol revealed that the unprompted response of the learners in Johnstone and Rivera's survey represented only the tip of the iceberg. Responses to the detailed interview schedule, with multiple probes and prompts, indicated that "almost everyone undertakes at least one or two major learning efforts a year, and some individuals undertake as many as 15 or 20. The median is eight learning projects a year," (1979, p.1), and the majority are self-planned. Tough defined a learning project as the dedication of at least seven hours in the previous twelve months to deliberate learning on a topic as the minimum criterion for inclusion as a learning project. His interview schedule has been used in a wide variety of contexts, in which the almost universal involvement of adults in self-planned learning has been verified.

Knowles, another student of Houle, also contributed greatly to the spread of interest in selfdirection in learning. His many books and articles asserting the need for and natural proclivity toward self-direction in adult learning continue to be among the most widely-read publications in the field of adult education. His assumptions of andragogy have been widely quoted, and his definition of self-directed learning is probably the best-known:

In its broadest meaning, "self-directed learning" describes 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. (1975, p.18)

As Tough explored the process of self-directed learning and Knowles advocated the importance of incorporating the facilitation of self-directed learning into adult classes and provided guidelines for its implementation, Guglielmino (1977/78) focused on assessing readiness for self-directed learning. She conducted a Delphi survey, using a panel of experts which included Houle, Tough, and Knowles, among others, to arrive at a consensus on the characteristics needed for a high level of self-direction in learning. The complex of psychological characteristics and skills agreed upon by the expert panel and supported by the literature formed the basis for the construction of the *Self-Directed Learning Readiness Scale (SDLRS)* (1977) and a working definition of the highly self-directed learner which includes both psychological characteristics and skillsets:

A highly self-directed learner, based on the survey results, is one who exhibits initiative, independence, and persistence in learning; one who accepts responsibility for his or her own learning and views problems as challenges, not obstacles; one who is capable of self-discipline and has a high degree of curiosity; one who has a strong desire to learn or change and is self-confident; one who is able to use basic study skills, organize his or her time and set an appropriate pace for learning, and to develop a plan for completing work; one who enjoys learning and has a tendency to be goal-oriented. (p.73)

As research on self-direction in learning increased, Knowles' definition and Tough's outlining of the steps involved in adults' learning projects came to be criticized by some scholars as presenting an overly linear view of the process of adults' self-directed learning (Candy, 1991; Danis & Tremblay, 1988; Mocker & Spear, 1982). Spear and Mocker's (1984) qualitative research provided a new perspective. They explored triggering events and motivating forces of adult self-directed learning as Tough had done, but also attempted to determine "*how* resources were acquired by the learners, and *why* and *how* decisions were made regarding the learning

process" (Spear, 1988, p. 200). After studying the projects of 78 self-directed learners who had not earned a high school diploma, they reported a lack of evidence of detailed preplanning "except in rare instances and then only in a vague fashion" (p. 200). They found that the learners in their study seldom considered a variety of alternatives in the selection of resources to use in their projects, usually using a single resource that was readily at hand in their immediate environment. They therefore postulated that self-directed learners, rather than preplanning their learning projects and proceeding in a linear fashion, tended to select a learning course "from limited alternatives which occur fortuitously within their environment," and that these alternatives structured their learning projects (p. 201). Spear's 1984 article softened this deterministic view to some extent, but maintained the assertion of strong environmental influence on the content and process of adults' learning projects. In contrast, Long (1989a) proposed the learner's psychological control as the critical dimension in self-directed learning.

All of these research efforts have expanded understanding of the process of self-directed learning and increased awareness of the methods used for learning and the ways in which adults' learning projects progress. There has been little attention paid, however, to the barriers that must be overcome by successful self-directed learners once they have begun a learning project and the events or circumstances that may interrupt the progress of their learning projects, either temporarily or permanently. Tough, who first described the episodic nature of adults' learning projects, confirmed the lack of attention to barriers encountered and how they are addressed by adult learners.

The increasing need to develop continuous, lifelong learners who are able to recognize and address their learning needs and remain effective and productive despite rapid change in all aspects of their lives is not likely to abate; in fact, as the rate of change continues to accelerate, the need for self-direction in learning will become more urgent. Research that has linked high levels of self-direction in learning with desired variables such as life satisfaction (Curry, 1983) and high performance (Guglielmino, P. & Klatt, 1994; Guglielmino, L., 1996), especially in jobs involving a great deal of change (Durr, 1992; Guglielmino, P., Guglielmino, L., & Long, 1987; Roberts, 1986) has fueled continued interest in exploration of the process of self-directed learning. Greater understanding of the self-directed learning projects and the ways in which they can be overcome. Additional insights could assist both professionals attempting to design and facilitate learning opportunities for adults and adult learners themselves as they attempt to address the learning needs and interests that continuously arise in our complex society.

#### PURPOSE

The purpose of this study was to investigate the learning projects of individuals considered by their peers to be highly self-directed adult learners, with special attention to exploring barriers to the pursuit of learning projects.

# **RESEARCH QUESTIONS**

- 1. Could the individuals chosen for the study because they subjectively identified as highly self-directed learners by the researchers be described as above average in self-directed learning in terms of the normative data available in the literature?
- 2. What barriers are commonly faced and overcome in adults' learning projects ?
- 3. What conditions or circumstances lead to interruption of learning projects?
- 4. What causes interrupted learning projects to be restarted?

### DEFINITIONS

#### *Highly self-directed learner*

Individual a) perceived to be highly self-directed by one of the researchers in this study, b) subsequently scoring in the Above Average or High range on the *Learning Preference Assessment* (self-scoring form of the *Self-Directed Learning Readiness Scale*), and c) having completed more than 8 learning projects in the year prior to the interview.

## Learning Episode

A learning episode is a period of time that is devoted to a cluster of sequence of similar or related activities, in which more than half of the person's intention is to gain and retain certain definite knowledge and skill (Tough, 1979).

#### Learning Project

A deliberate effort to gain and retain a knowledge or skill to which a learner had devoted at least 7 hours, usually in a series of related episodes, during the year prior to the interview. Of special interest in this project were barriers, interrupters, and restarters in learning projects.

#### Barrier

Any circumstance or condition which made a learning project difficult to continue, something that the learner had to surmount in order to persist in the learning initiative.

#### Interrupter

Any circumstance or condition which causes a learner to interrupt or end a learning project.

#### Restarter

Any circumstance or condition which causes a learner to resume an interrupted project.

# CONTEXT

This research was designed and conducted as a part of a Florida Atlantic University doctoral course in self-directed learning in Spring, 2003. After studying a wide variety of definitions of self-direction in learning and examining the stream of research and the contributions of major researchers on this topic, the researchers conducted a teleconference with Allen Tough as a prelude to including a modification of his interview schedule in a broader investigation of the learning projects of highly self-directed learners. During the teleconference Tough confirmed the paucity of research on barriers to the continuation of self-directed learning projects that the group had noted. Additional interview data were gathered by two other doctoral students in adult education who were not a part of the class.

#### METHODOLOGY

## Sample

The purposeful sample of 14 adults was chosen from among individuals known to the researchers and perceived by them to be highly self-directed learners. The subjects interviewed were three males and eleven females (age  $48.7\pm8.5$  years; education level  $15.9\pm0.3$  yrs). Five subjects were high-level administrators, 4 were teachers, and the others were a retiree, an administrative worker, a health professional and a clerical/sales/technical worker. One occupation was unspecified.

## Instrumentation

# Self-Directed Learning Readiness Scale/Learning Preference Assessment

The Self-Directed Learning Readiness Scale (Guglielmino, 1977/78) is a 58-item, Likert-type instrument designed to assess individual attitudes, values, skills and personality characteristics supportive of self-direction in learning. The self-scoring form is called the *Learning Preference Assessment* (Guglielmino & Guglielmino, 1991a), this is the title used when discussing the instrument with individuals responding to it in order to avoid response bias. Expert judgment was used to ensure the content and construct validity of the instrument. Based on input from a Delphi panel of 14 experts in the field of self-directed learning, a list of characteristics of individuals with high levels of readiness for self-direction in learning was created. In a three-round process, the panel arrived at consensus on the characteristics they deemed important for self-direction in learning, including attitudes, values, abilities, and personality characteristics. Those items emerging from the Delphi panel with a rating of desirable, necessary or essential were used as a basis for the *construction of the* SDLRS *items*.

An internal reliability of .87 (Cronbach alpha) was reported for the pilot instrument as well as the 58 item version used today. Most published studies on populations over twenty years old report similar reliability figures that fall within a range of .72 - .92. In addition to internal reliability estimates, Finestone (1984) and Wiley (1981) reported test-retest reliability coefficients of .82 and .79 respectively. Based on a population of 3,151 individuals from the United States and Canada, a split-half Pearson product moment correlation with a Spearman-Brown correction produced the highest reliability figure of .94 (Guglielmino & Guglielmino, 1991b). Although

there have been some criticisms of the SDLRS, (Brockett, 1987; Field, 1989), the vast majority of studies have supported the reliability and validity of the instrument (See, for example, Delahaye & Smith, 1995; Durr, 1992; Finestone, 1984; Graeve, 1987; Hassan, 1982; Long & Agyekum, 1984; McCune & Guglielmino, 1991; Posner, 1989/90; Russell, 1988).

The *SDLRS/LPA* is the most widely used quantitative instrument in the study of self-directed learning (Merriam & Caffarella, 1999). Overviews of research using the instrument can be found in Brockett and Hiemstra (1991), Merriam and Caffarella (1999) and Delahaye and Choy (2000).

# Tough's Interview Protocol

The second instrument was a modification of the Interview Schedule for Studying Some Basic Characteristics of Adult Learners developed by Tough (1971, 1979). It focuses on obtaining as complete a report of an adult's learning projects in the prior year as possible through the use of questions followed by extensive prompts. Once a list is compiled, researchers are instructed to then ask detailed questions about each of the projects mentioned, assessing such things as motivators for the project, time spent, planner(s), current status, amount learned, level of satisfaction, level of enthusiasm, and major source of subject matter. Interviewers use supporting reference documents listing categories of responses from which interviewees can choose in response to certain questions regarding motivations, methods, and learning environments. Some multiple choice questions are included as well. Tough's interview schedule and modifications of it have been used widely in adult education research.

#### Additional Questions on Barriers, Interrupters and Restarters

The researchers designed open-ended questions to gather data on barriers and restarters of learning projects. Two sets of questions were used, in two different parts of the interview. The first set was:

- 1. Were there any barriers that made it more difficult for you to continue your learning project? If so, please describe.
- 2. How did you overcome these barriers?

Later in the interview, participants were asked: "Was the learning project interrupted or restarted at any point?" Probes were: "Please explain," and "What caused the interruption or restart?"

The use of questions related to both "barriers" and "interrupters" was designed to elicit information on a broad representation of hindrances to the completion of learning initiatives, from those that were more easily overcome and did not cause long delays in continuation to those that were perceived as causing an interruption in the project. Some overlap in responses was expected.

# Data Collection

After the research procedures were approved by the Institutional Review Board, researchers contacted their chosen interviewee(s), explained the purpose of the proposed interview ("to

respond to some inventories and talk about things you have tried to learn during the past year") and asked if they would participate and allow their comments to be recorded. If they assented, a mutually agreed-upon time and location were selected.

At the interview, interviewers first greeted the interviewee, then explained the consent form and asked for a signature. They then reiterated the purpose of the research and asked the subjects to complete the *Learning Preference Assessment (SDLRS)*. Subjects placed their responses on machine-scannable answer sheets. Upon completion of this scale, each researcher conducted the structured interview with the subject. The researcher verbally asked the questions on the interview form.

Each learning project was not explored in detail as in Tough's interviews; instead, after learning efforts that required fewer than 7 hours over a 12-month period were eliminated, learners were asked to identify their "most meaningful" and "most useful" projects. Researchers asked the indepth questions on a minimum of five of the learning projects selected for one or both of these categories.

The additional questions created by the researchers to explore barriers, interrupters and restarters were asked during the same session. The questions were asked in relation to each of five learning projects which the participants had selected as "most useful" or "most meaningful." Broader, open-ended questions were asked first, and researchers were encouraged to listen and record the unframed responses of the learners before probing for additional information, if needed, to address the research questions. Researchers made notes on responses and the subjects' comments were audiotaped for later transcription.

# Data Analysis

#### Self-Directed Learning Readiness Scale (Learning Preference Assessment)

The *SDLRS/LPA* data and the other quantitative data that had been coded onto machinescannable sheets were scanned and downloaded to a disk. Using Statistical Package for the Social Sciences (SPSS), the *SDLRS/LPA* was scored and the results compared with the average adult mean and the means of other groups. Items without a response were coded as a 3; if more than 6 items were unanswered, the instrument was discarded. Frequency counts were made of the other quantitative data and means and ranges were calculated as appropriate.

#### Tough's Interview Schedule

Numbers of learning projects meeting Tough's criteria and total hours spent on learning projects in the 12 months prior to the interview were tallied and group means and medians were calculated.

#### Additional Questions on Barriers, Interrupters and Restarters

Researchers worked in groups of two or three, with responsibility for analysis of 5-6 interviews, including the one(s) they conducted. After re-reading the transcripts, they first coded each item

of information noted as a barrier, interrupter or restarter. After the individual notes were recorded, all the groups met to jointly sort and categorize the responses. Teams of researchers then assumed responsibility for identifying themes within the categories, grouping the notes accordingly and drafting an initial description. All researchers then examined the themes via an electronic blackboard and provided longer quotes from their transcripts as needed to explicate the themes. Some modifications were suggested during this step.

## Limitations and Delimitations

The study focuses only upon a sample of individuals who are perceived to be highly self-directed learners within the life circles of the investigators. Generalization is limited by the size of the sample (14), its lack of diversity (white, middle-class, Florida), and the subjectivity of the self-analyses of sample subjects.

While objectivity is always challenging in reporting and interpreting interviews (Merriam & Simpson, 1995), efforts were made to reduce bias in the gathering and analysis of information. The researchers were asked to use the structured interview schedule provided and to record initial responses to each question before proceeding with other questions for clarification, thus avoiding projection of expectations or prompting based on personal knowledge. The taping of interviews and analysis of transcripts by multiple researchers also contributed to the reduction of any individual researcher bias connected with the interviewee.

# FINDINGS

#### SDLRS Scores

The SDLRS scores were not tabulated until after the interviews. The subjects selected by the researchers from among their circle of acquaintances had *SDLRS* scores which placed them well above the mean. The group mean score for the *SDLRS* was 239.7, which ranks the group in the  $81^{st}$  percentile. This is higher than the general adult population mean score of 214 as determined by the developer of the *SDLRS* and higher than the mean score of 222.7 derived from a meta-analysis of 29 different studies using the *SDLRS* with adult populations who were primarily professionals and students involved in higher and continuing education (McCune, Guglielmino, & Garcia, 1990). As a further comparison, the mean score of a sample of the top entrepreneurs in the United States was 248.6 (Guglielmino & Klatt, 1994). Correlation data revealed a significant (p>0.01) relationship between education level and *SDLRS* score.

#### Numbers of Learning Projects

The interviewees had completed an average of 13.8 learning projects in the prior year which met the seven-hour minimum, with a range from 8 to 26 projects. The median number of learning projects for the group was 13. Hours spent on each learning project averaged 56.1, with a range from 14.5 to 183.4 and a median of 38.1.

#### Learning Project Barriers

The major barriers identified could be categorized into seven themes. They were time, lack of accessibility or adequacy of human or material resources, aspects of the learners' interactions with other people, personal limitations, issues related to the use of formal learning activities as part of a learning project, technical difficulties and loss of intensity. Other specific barriers were identified with less frequency. The themes are briefly described, followed by illustrative quotes from interviewees.

#### Time

Time was primarily reported as a barrier in the sense that there were other higher-priority demands on the learner's time:

Caused by your job, it is very hard to get this stuff on the web by just squeezing it in to your day.

 $\dots$ Time was a common barrier to all of them, trying to get them done when you wanted them done. It was common to all of them.

Finding the time to read and practice the suggestions.

Just other priorities of life.

Individuals who chose formal offerings as a part of their learning projects also reported the need to find offerings at times they were able to attend. Learners reported that they were able to manage their time better if they assigned priorities, causing a learning initiative sometimes to temporarily take a back seat to a higher priority demand. For instance, one stated, "Life shattering events could come in every now and then and then I would just move on again." They also reported that using self-discipline not to waste time and specifically scheduling their future expenditures of time were quite functional. They reported that they also were able to use idle times, such as a school break, to catch up with their other life demands and devote time to their learning initiatives.

#### Lack of Accessibility or Adequacy of Human or Material Resources

Some learners reported coming to a point in their projects at which they needed a subject matter expert to explain or clarify learning material for them and finding such an expert sometimes was problematic.

We don't have access to the IT people.

Conflicting information and the need of an expert to sort out the valid from the invalid was a difficulty.

Some mentioned difficulty in accessing needed materials or resources.

Sometimes, simply having difficulty in finding an authoritative source in a book or on the computer constituted a barrier to learning.

Locating a training program for learning sometimes was a challenge.

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Others reported that once the proper resource was found, it was difficult to understand. Unclear technological manuals were specifically cited. Also mentioned was, "conflicting information regarding the procedure in question and the outcomes." In one case, inability to find adequate models for comparison (as part of a learning project related to the purchase of a major appliance) caused extra and frustrating effort:

There could have been more and different models on the sales floor to choose from because they really don't have very many, just low, medium and high. Not very much in between.

#### Interactions with Other People

Learners reported that various types of interactions with others within their life circles were competing priorities. Most generally, their family responsibilities and general social interactions, events and obligations took time away from their learning projects.

Spouse and family demands for shared time, or forced coordination with the spouse's schedule, required adjustments by the learner:

Yes, there's ... some barriers in terms of ... family relationships and other social relationships that have to be adjusted, and of course there's the practicality ones in terms of change of events and combining two lives...

Working into other people's schedules for required interactions forced them to adjust their own schedules. For example, one person stated,

Yes, some days when I had plans to go, when I had time off from work and the kids had time off to go investigate the public school, they (the public school) were off a lot of the time.

Difficulties in communicating with others sometimes caused misunderstandings, misinterpretations and missed communications. One person who was trying to assist his parent with a health problem listed her reticence as a barrier:

My mother, who was reluctant to share information so that I could help her.

#### Personal Limitations

Several learners reported that inadequacies in personal skills or abilities made progress difficult. One reply to the question about barriers was simply, "Ability." Others specified barriers related to technical or process knowledge:

Well, one barrier I can think of was with Quark Express. I just did not understand converting pictures into CMYK format and how to improve their resolution.

I had one snafu when I mixed the mastic; I didn't measure.

Sometimes, the learning required a degree of skill or creativity which they feared they might not have (the psychological barrier of fear of failure):

Only knowing that I could fail in the back of my head, but I don't know if you consider that a barrier.

Physical barriers were sometimes cited, as was a lack of confidence in general ability:

Physical barriers that prevented me from doing some exercises, I have some fused disks in my spine.

Yes, it is on hold now, I got some pinched nerves.

You need the physical skills in order to do it.

#### Issues Related to Use of Formal Learning Offerings as Part of a Learning Project

Learners sometimes found that there were unexpected costs associated with the learning projects. One learner who had chosen a formal session as a part of a learning project reported finances as one of the barriers encountered:

...It was... financial. You had to be able to afford to go. You had to be able to get yourself there. You had to be able to...get off work....to go to the particular learning center....

Others reported the need to find offerings at times they were able to attend. One learner who used a formal class as a part of a learning project reported that philosophical differences with the instructor made learning more difficult. The distance in driving to a learning location was also cited.

#### Technical Difficulties or Malfunctions

As might be expected in our technological age characterized by heavy dependence on computers and other technological equipment at work or for learning, technical malfunctions or failures frustrated learning sessions:

Yes, the computer program did not work properly when installed. That prevented instruction on how to assess test scores.

Sometimes I couldn't get the internet to respond.

#### Loss of Intensity

Some experienced indecisiveness. Others had trouble persisting when progress was not clear. Some found that their earlier passion for learning the subject material had waned.

#### **Other Barriers**

A number of other, more unusual events or circumstances were reported, such as the stress of 9-11 and the war on terrorism:

A lot of stress involved with the war and not knowing if we were going. For a while I was just treading water when I should have been taking the time to do more research...

The weather and seasons of the year were mentioned as barriers to a gardening project:

Just weather. Sometimes we could not go out because of weather.

An individual who became responsible for operating a dinner theater mentioned the extensive learning required to comply with a government regulation:

Getting a liquor license....I learned quite a lot about securing mass quantities of alcohol.

Prior learning sometimes had to be forgotten, or over-ridden by new learning. One respondent stated:

Ah, the major barrier is.... in a sense, past learning because of other games and other activities and you have to remember that those don't apply to this.

## Learning Project Interrupters

As expected, there was some overlap between reported barriers and interrupters, but some qualitatively different categories emerged from the question on interrupters as well. The interrupters most analogous or related to barrier categories are listed first: life events [time], personal limitations and lack of human or material resources. Reported interrupters that seemed to offer new perspectives included change in goal or priority of goal, conscious redirection or reframing, other learning projects, and perception of danger. Completion or satisfaction was a response offered by several learners. Other interrupters that were not reported frequently enough to merit a separate category are also reported.

#### *Life events* [*Time*]

An analysis of the transcripts indicates that it is not major life events that most frequently interrupt learning projects; rather, the interrupter is expressed by learners as "daily activities," "events of the day that need addressing," "other day-to-day priorities," "various daily life hassles," or "child, dog, cat, husband," summarized by one learner as "just life and everything else that goes on. You have to start and stop." These comments reflect the episodic nature of learning projects and are analogous to the barriers categorized as "Time."

"Regular work responsibilities" and "other work issues" were typical ways of reporting that the press of regular job responsibilities often interrupted work-related learning projects. For example, one interviewee commented on having to suspend learning related to organizing a fundraiser for her organization on occasion to keep up with routine job responsibilities. Another, responsible for a new initiative related to the design and implementation of employee morale and development programs commented:

This process has continued for a year, progressing from one day to the next. While there have been no lengthy gaps to interrupt, the events of each work day have kept the learning from being continuous.

Less urgent and time-bound personal learning goals were often set aside temporarily, despite strong interest, because of the demands of daily life. One learner reported on his unhurried learning to use a global positioning system (GPS) as a safety feature when boating:

Yes, because there was no hurry on my part. So it was like it was not a high priority and I guess in my day to day activities...

Conversely, some learners reported that their projects had to be completed within a certain time frame, so they "had to work through the usual interruptions."

Major life events were also mentioned as interrupters, but with less frequency: One learner reported on his impending marriage as both the motivation for a number of learning projects and an interrupter for others. Another commented:

What happens is... life happens: for instance, with my daughter going to college I kind of put things on the back burner; so when I have time, 'cause creativity, of course, takes a different kind of mode in your brain, and so when I, my brain, can go back into that mode, that's when I start writing again.

#### Lack of Resources--Human and Material

Funding was reported as an interrupter in two learning projects that required financial assistance; and waiting for materials or equipment were mentioned (waiting for a book that had been ordered or waiting for a computer to be installed or repaired).

The human interrupters noted were (a) lack of availability of a joint decision-maker, (b) lack of a knowledgeable resource person for a particular aspect of one project, (" we waited a few weeks till the specialist appointment, so that was one interruption. Kind of on hold for a couple of weeks..." and (c) an individual or group to practice a new sport with:

the time frame where I got some instruction and was only playing with one person. Another opportunity presented itself and then finally the opportunity to play in a actual game setting, so ...so there were various interruptions between work and...and other events.

#### Personal Limitations

Frustration with a tough problem and inability to immediately discern ways to gather the needed information was reported as an interrupter by two learners:

Actually, with Microsoft Word, I stopped several times with my frustration like I'd hit a wall that I couldn't figure it out.

I was teaching myself and when I'd hit a wall I'd have to get away from it for awhile before I'd try to tackle my way through a stumbling block.

Physical limitations were also cited ("I got some pinched nerves").

## Completion or Satisfaction

Interestingly, completion of the project to the learner's satisfaction was a frequent response to the question about interrupters. Terminology such as "I met my immediate need," "I met my goal," "Satisfaction—I'm now ready for the next version that can do even more," and "Completed the project" were used to express meeting of the learning need. This apparent contradiction will be discussed later in the paper.

## Reframing or Redirection

As learning progresses, some learners discover alternative paths and reframe their project or redirect their learning to explore those alternatives. In one case, a major learning project named by the learner as "preparation for back surgery" was interrupted by the discovery of a possible viable option:

I learned about physical therapy and chose that path for recovery first. During this time, I stopped doing research on surgery hoping that it was not necessary.

She later resumed her research on the benefits and dangers of surgery when the alternative therapy did not lead to relief, then redirected her efforts to "sporadic [research] on exercise and strengthening programs" when the surgery was successful and the pain was lessened.

Another learner reported interrupting a learning project related to purchasing a home to study the process of building a home.

#### Change in Priority of Goal

Changes in priorities of work-related projects also often cause one to interrupt the other, as noted in the previous example of organizing the fundraiser.

Personal priorities were also mentioned. One learner set aside an urgent and concentrated study of prostate cancer when new tests showed no sign of cancer. In reference to a project related to the creation of mosaic tile designs, another learner reported his delay in beginning to construct a table with a mosaic top as a first effort and then his focused effort when a deadline loomed:

I had the desire almost two years ago, and I bought the little kit and the instructions and never did anything with it. Then when my Mom's birthday was coming up, I decided I would finally tackle trying to do the mosaic table. So I guess I had a deadline in front of me.

#### Other Learning Projects

It became evident that, for these active, involved learners, one learning project often interrupted another. The project with the highest priority at the time, or the one that had a time deadline received priority and the others were temporarily set aside. However, these learners often managed numerous projects simultaneously, without gaps that they considered to be interrupters. A learner who was simultaneously engaged in many highly creative projects commented on moving from one to the other based on time and inclination. Others commented: I teach several classes. Focusing on one is not easy. I have to prepare for them all.

....I don't do one thing all of the time-[I go] from one to another, back and forth.

#### Perceived Danger

Two learning projects, both travel-related, were interrupted by concerns about the possible danger in traveling to the countries involved or the general concern about international travel because of the war in Iraq. In one case, part of a learning project was abandoned (presumably for the duration of the war); and in the other case, it was redirected to a country considered to be safer and was carried out:

I discovered Costa Rica could be a little dangerous for young girls in the cities, so I didn't want to take my child.

The war. We were really deciding whether we should go or not. We really didn't decide to go through with it until 3 days before departure because of the war. We did decide not to go to other countries besides France because of it.

#### **Other Interrupters**

One learner who was required to participate in many class-based learning activities because of his work (law enforcement) and exhibited a strong growth orientation decided to pursue an advanced degree in his specialization of criminal justice. He later left the program, stating,

I got turned off to the program due to a mismatch of philosophy with the instructors. I found the instructors to be very political.

Other interrupters mentioned included the change of seasons (for a gardening project), a need for a change in organizational policy before a new training approach could be implemented, and lack of support.

#### Learning Project Restarters

The major restarters listed were time, lessons and/or formal training, learning from family members and other people, patience and persistence. There was a wide range of other restarters that were not mentioned frequently; therefore, they will be reported under other restarters.

#### Time

Time, which had been listed as both a barrier and an interrupter when it was lacking, was also cited as a restarter:

Other priorities died down that gave me the time to devote back to this project.

Another time-related restarter was facing a deadline. Two learners commented on this aspect of time:

I guess I had a deadline in front of me.

I have to finish it before the end of May so that we can still use those funds.

#### Lessons and/or Formal Training

Learners stated that taking "lessons" or having "formal training" was or could be the impetus to restarting some learning projects:

I'd try to tackle my way through a stumbling block ... once I had the formal training.

#### Learning from Other People

Some learners restarted their interrupted projects by seeking help from other people. They "worked with family members," "talked to somebody else" or learned from others:

For Microsoft Word, I talked to my sister 'cause she used to teach it

Other learners talked to co-learners or learned from others:

For Crystal [a software program], I talked to other students in the class who might have had a better understanding of the tools than I did.

#### Patience and Persistence

Some learners, as reasons for restarting projects, implied personal qualities or character traits such as "trying to be patient" and persistence. Despite feeling that their meaningful learning was interrupted and they were not making progress toward their learning goals, they persisted in their search:

I kept asking questions. I kept reading material that was even remotely related... till I hit on...I don't know, the light bulb just went off one day.

#### Other restarters

Various additional reasons were cited as an impetus to restart learning projects. Clarification was a theme mentioned, such as "clarification of rules," or a "further understanding of the desired end." Other restarters included finding an "alternate approach to solving the problem," a personal decision that the project was "safe," saving money, and restarting in a new direction because of an unsatisfactory outcome.

#### DISCUSSION AND CONCLUSIONS

The first point addressed in this section relates to the accuracy of the researchers' perceptions in selecting subjects who were highly self-directed learners. The remaining points relate to the findings on barriers, interrupters and restarters identified in the research.

It must be emphasized that this initial research used a sample of convenience, focused on those perceived to be (and subsequently verified as) highly self-directed learners. No attempt was made to control the choices of subjects by the researchers; they were merely asked to select subjects in their circle of acquaintances or in their workplaces whom they believed to be highly self-directed learners. The resulting sample, while representing both genders and diversity in age and occupation, is not a representative sample in terms of race or ethnicity.

## Accuracy of the Interviewers' Selections of Highly Self-Directed Learners

The data collected from SDLRS scores, numbers of learning projects conducted, and number of hours spent in self-directed learning validated the researchers' perceptions that the subjects chosen were highly self-directed learners.

The learners in this study compared favorably to others in terms of numbers of learning projects conducted and SDLRS scores. In comparison to the mean of 8.3 projects reported by Tough (1979), the sample for this study reported 13.8. The average number of hours reported per project, however, was lower: 56.1 as compared to 100. In Tough's discussion of "high learners" (1979, p. 28), he refers to "some men and women [who] learn to an extraordinary degree," completing as many as 15 or 20 learning projects per year and spending up to 2000 hours on the learning. In this study, more than one-third of the learners reported fifteen or more projects, and 2 of the 14 learners reported more than 20. Two of the learners (not the same two) also reported well over 2000 hours of learning. The SDLRS scores reflected this high level of learning activity, with a mean of 239.7, placing them in the 81<sup>st</sup> percentile, less than nine points below the mean of the top entrepreneurs in the United States (Guglielmino, P., & Klatt, 1994).

# Variety of Learning Projects

Despite exceptionally demanding careers, the learners interviewed found time for a wide variety of learning projects, ranging across all aspects of their lives. One highly creative learner combined projects related to managing a performing arts center, researching and writing a book and a play, learning to ride a Harley, learning to use a Palm Pilot and a new cell phone, remodeling a building, learning a ticketing software program, selection of artists for a seasonal series, training a new employee, redecorating a home, helping a child adjust to college, relandscaping a parent's home, researching surgery options and reviewing French in preparation for traveling overseas, in addition to ongoing projects such as relationship skills and cooking skills.

Another reported 26 different projects that met Tough's 7-hour criterion, related to such diverse topics as building a home, teaching a firearms course, learning new techniques for disabling snipers, researching various historical topics, exploring alternative energy sources such as hydrogen fuel technology, and preparation for teaching a children's Bible class.

# Near-Universality of Reported Barriers or Interrupters for Each Learning Project

In the five "most meaningful" or "most useful" projects of each of the 14 learners (a total of 70 projects), a variety of barriers, interrupters and restarters were present in nearly every learning

project of any significant length or complexity. Some barriers and all of the interrupters caused pauses of various lengths in the projects. These reported pauses reflect Tough's finding that adults' learning projects are usually episodic, with most consisting of more than three or four episodes, spread over at least two or three days (1979, p, 15) and Spear's (1984) finding of "clusters" within adults' learning efforts.

The responses to the questions about barriers and interrupters usually came quickly and were numerous, compared to the fewer responses about ways in which the barriers were overcome or the projects restarted. This observation suggests that adult learners might benefit from the ability to become aware of how learners engaged in similar efforts were able to move forward despite barriers and interrupters.

## **Overlapping Categories of Barriers and Interrupters**

The questions relating to barriers and interrupters were asked at different points in the interview, with several other sections between them. Learner responses revealed an overlap between some categories of barriers of interrupters. The interrupters most analogous or related to barrier categories were life events [time], personal limitations and lack of human or material resources. As an example, time, in its various manifestations, was one of the most common barriers. If it was not overcome (usually by prioritizing), it could become an interrupter. Exceptions appeared to occur only when the project was stringently time-bound. When asked about interrupters in a project in which the individual had to present the result of the learning within one week, for example, the response to the question about interrupters was, "I had to work through the [potential] interrupters."

While it is probable that some learners may not have clearly distinguished between barriers and interrupters as defined by this study, their responses to both questions added richness and depth to the data. The question related to interrupters, in particular, provided some interesting further avenues to explore.

# Congruence of Reported Barriers to Continuation of Learning Projects of Highly Self-directed Learners to Barriers to Participation in Adult Education Reported in the Literature

While the scope of this article does not permit an extensive comparison of barriers and interrupters to the continuation of learning projects reported in this study to the barriers to participation reported in the literature of adult education, some brief observations will be made. Two of the reasons most often cited for lack of participation in adult education are lack of time and lack of money (Johnstone and Rivera, 1965; Long, 1983: Merriam and Caffarella, 1991; Valentine, 1997), possibly because these are considered to be socially acceptable reasons. Time was the most-cited barrier to participation in learning projects in this study and among the interrupters, competing life events, also involving an aspect of time, was the most frequent. In contrast, money issues were cited only a few times as a barrier or interrupter in this study. When money was mentioned, sometimes it was in connection with a formal offering. It is likely that the larger number of self-directed projects accounted for the few reports of finances as a barrier or interrupter. The lack of diversity of the sample (all middle class) probably contributed to the difference as well.

The barriers reported in this study could all be categorized in Cross' (1981) typology of *situational, dispositional, and institutional* barriers, although not necessarily as unitary groups. The largest number of classifications fell into the situational category: time, lack of accessibility or adequacy of human or material resources, aspects of the learners' interactions with other people, technical difficulties and the physical aspect of personal limitations. Falling into the dispositional category were the barriers related to loss of intensity and the personal limitations that related to psychosocial obstacles (as subdivided by Darkenwald and Merriam, 1992). Most of the issues related to the use of formal learning activities as part of a learning project, when that route was taken, were aligned with Cross' institutional barriers. While all of the barriers mentioned in this study could be categorized in Cross' typology, it is likely that specific barriers would be reported with differing frequencies in a study including only learning in formal settings.

#### Active vs. Inactive Learning Projects

The frequency with which individuals responded to the question about interrupters with some indication of completion led to a closer examination of the interview schedule to determine if the questions were unclear and then to a reexamination of the interviewees' responses. It became apparent that the learners were saying exactly what they meant. The participants themselves decided when they had learned what they needed to know. Their personal satisfaction, not total mastery, sufficed for "completion" of a learning project. However, they often recognized that they were likely to revisit a learning project in the future, even if they had learned all they wanted or needed to know about the topic at that time; thus completion, in the sense of meeting their immediate need, was classified as an interrupter. These instances suggested that the learners were consciously moving the learning project from an active to an inactive status.

One example was an individual who was learning to use a Palm Pilot. She realized that there were many more functions available than she had mastered, but she had learned what she wanted to know. While she had no plans of pursuing a comprehensive knowledge of all its functions, she recognized that at some future time other functions might be of use to her.

# Self-direction in Learning

A number of the learning projects reported by the learners were mandatory training sessions related to their jobs; however, many reported pursuing the topics far beyond the mandated sessions and all reported a number of self-initiated projects. The interviews provided strong evidence of learners accepting responsibility for their own learning: evidencing initiative in seeking out learning, selecting and pursuing a variety of approaches to learning, and redirecting the course of their learning projects in order to meet their goals. They persisted in the learning projects that were important to them despite juggling very full lives and facing difficult challenges. Even when engaged in formal learning settings, the learners gave evidence of viewing those events or programs as a part of a larger learning effort.

One of the most active learners with a rich diversity of projects abandoned an advanced degree program in criminal justice that he had chosen to pursue, citing a mismatch of philosophy with

an instructor. Noting that the degree was not necessary for his career advancement (he had risen quite quickly to a high position in his organization), he emphasized the learning essential to his position was separate from any formal training program:

I am an example that formal education is not a necessary element to job advancement....If there was a motivation to continue as related to job advancement [I would have completed the degree].

Using information gained in his own learning projects, he often developed training programs for his organization.

The persistence and conscious redirection of learning projects to meet the learner's needs is reflected by a learner whose project related to addressing her severe back pain:

I was dealing with ongoing back problems. One of the options to alleviate the ongoing pain and prevent further damage was surgery (microdiscectomy). I felt it was necessary to make the most informed decision possible. I [then] learned about physical therapy and chose that path for recovery first. During this time, I stopped doing research on surgery, hoping that it was not necessary. I restarted this project a month later when therapy was not providing relief. The surgery was successful—research is now sporadic...on exercise and strengthening programs.

The learners also reflected a strong theme of lifelong learning. Some mentioned learning projects they had been involved in for years and expected to continue. They also expressed an insatiable zest for learning and a sense that meaningful learning projects, even if completed, often continue to be revisited, some indefinitely:

Well, once you complete it you redo it, keep revising, looking for new resources.

This study identified several phenomena that typically are reported as barriers, interrupters, or restarters in the learning projects of highly self-directed learners. The knowledge gained provides some initial insight into the forces that may hinder, interrupt, or permanently stop a learning project as well as the ways in which highly self-directed learners overcome barriers and restart interrupted projects; however, as many assert (Brockett & Hiemstra, 1991; Long, 1991; Merriam & Caffarella, 1999), self-directed learning is a complex and multidimensional process. Much research is still needed to explore its many aspects.

#### SUGGESTED FUTURE RESEARCH

The findings of the line of inquiry pursued in this study suggest many questions for further analysis and future research. Among them are:

- 1. Would the barriers, interrupters, and restarters reported by a more racially and ethnically diverse group of highly self-directed learners be similar to those reported in this study?
- 2. What factors are responsible for the differing impact of similar barriers on different learners?
- 3. Are there differences in the types of barriers or interrupters reported by males and females or by different age groups? Johnstone and Rivera (1965) reported differences by age and gender groups and Valentine (1997) reported gender differences in the UNESCO study.

- 4. Are there differences in the barriers and interrupters of workplace-related learning projects as compared to other learning projects?
- 5. To what degree would information on barriers and interrupters of adults' learning projects and the ways in which they can be addressed be helpful to learners and learning facilitators?

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