

The Case for Promoting Self-Directed Learning in Formal Educational Institutions

Lucy Madsen Guglielmino

Florida Atlantic University

Florida

USA

Email: lguglie@fau.edu

The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.

-Alvin Toffler

Abstract

After self-directed learning (the process) and self-directed learning readiness (a complex of personal attributes) are defined and discussed, the primary thrust of the article is presented: preparation for self-directed learning (SDL) is essential in 21st century educational institutions because of the unprecedented and exponentially increasing rates of change we all face in all aspects of our lives. The challenges educators face in implementing a paradigm shift in educational approaches are detailed, followed by a brief discussion of a number of research studies that establish the fact that SDL readiness can indeed be increased through appropriate interventions and methodologies. Some of the research-based benefits and correlates of SDL are then documented, such as life satisfaction, academic achievement, workplace performance, conscientiousness, resilience, strategic thinking, creativity and flexibility, and cross-cultural adaptability. The article ends with some guidelines and suggestions for integrating SDL into the curricula of formal educational institutions to ensure that students are prepared for the lifelong, self-directed learning that the future will require of them.

Self-direction in learning has been one of the fastest-growing and most-researched areas of education for the past 40 years, and the realisation is spreading that SDL is an essential skill for the 21st century. Knowles (1975), in the most-cited definition of the process of SDL, indicates that it occurs when the learner takes the responsibility for identifying learning needs, developing learning goals, preparing a learning plan, locating learning resources and implementing the plan, and evaluating the results and the process—essentially, directing his or her own life and learning. Opportunities for SDL exist along a continuum in varying instructional approaches; every learning situation has the potential to develop the skills and attitudes supportive of SDL, but rarely is there opportunity for fully self-directed learning in institutional contexts.

Merriam *et al.* (2007) present a number of other descriptions of the SDL process, but also note that much of the research on SDL has focused on SDL as a personal attribute. They cite the characteristics of a highly self-directed learner, determined through Guglielmino's (1978) Delphi survey of experts, as the most-used operational definition of a self-directed learner:

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. (Guglielmino, 1978:73)

The extent to which a learner exhibits these personal characteristics—these attitudes, values, and abilities—comprises the individual's level of readiness for self-directed learning. Levels of readiness for SDL naturally also exist along a continuum, with some learners having very high SDL readiness levels and others showing a strong preference for direct instruction.

The Escalation of Change

Why have these learner characteristics and the process of SDL become so critically important in recent years? The primary answer to that question is *change*: the massive, escalating proliferation of information and technology.

The findings of a large and meticulous study conducted by Lyman and Varian (2003), at the University of California, Berkeley, indicated that new stored information almost doubled between 1999 and 2002, growing at an estimated 30% per year. The researchers noted that in 2002 alone, print, film, magnetic, and optical storage media produced about five exabytes of new information. They explained the phenomenal volume of five exabytes:

If digitized with full formatting, the seventeen million books in the [U. S.] Library of Congress contain about 136 terabytes of information; five exabytes of information is equivalent in size to the information contained in 37,000 new libraries the size of the Library of Congress book collections.
(p. 1)

While that finding was considered astounding, Google CEO Eric Schmidt made an announcement in 2010 that dwarfed its impact when he detailed the exponential escalation of the production of new information. Schmidt asserted, “*Every two days we create as much information as we did from the dawn of civilization until 2003: five exabytes of data*” [Italics added] (Kilpatrick, 2010). Within approximately one-tenth of an average human lifespan, the amount of new information that was considered almost inconceivable to produce in the space of one year (2002) was being produced every two days (2010).

The almost incredible volume of new information production is accompanied by vast changes in technology, speed of communication, social norms and systems—in virtually every area of life. These changes, in turn, are fuelling globalisation on a scale not even imagined at the turn of the century (Friedman, 2005). 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, at multiple levels:

- the personal and professional survival of individuals,
- survival of the organisations in which they work and the families of which they are a part, and
- survival and thriving of the communities and countries in which they live.

Many years ago, education was considered to be a preparation for life. In the late 1940’s, an individual could expect to graduate from high school with 75% of the knowledge needed to remain successfully employed until retirement. Fifty years later, that figure was reduced to 2% (Barth, 1997). Just as childhood learning is no longer an adequate preparation for life, initial training or learning is not an adequate preparation for maintaining competence on the job or in a profession.

The Challenge for Educators

In times of rapid change, the central impetus for diagnosing the learning needs, locating learning resources, and carrying out and evaluating the learning logically must come from the individual; we do not have mentors who can follow us throughout our lives, pointing out what learning is needed and how to obtain it. The self-directed learning of individuals is the basic building block of strong families, organisations, communities, and countries.

As educators, we are now challenged to prepare our students for a future we cannot even predict. If we do not prepare our students to be self-directed, lifelong learners, we are doing them a grave disservice (Abeles, 2010; UNESCO, 2009; Guglielmino, 1978, 2008; Knowles, 1975). Our task, then, is to use strategies for developing these skills and attitudes--for moving toward self-directed learning--in formal learning settings. This movement is not a linear process. For students, it requires a transformation:

- from following orders to carrying out self-directed learning activities;
- from memorizing and repeating to discovering, integrating, and presenting;
- from listening and reacting to communicating and taking responsibility;
- from knowledge of facts, terms, and content to understanding [and developing] processes;
- from theory to application of theory;
- from being teacher-dependent to being [independent] (Intel, 2003).

But educational institutions change slowly, and major changes are needed: nothing less than a paradigm shift. Very wisely, esteemed Harvard education professor Roland Barth, who was known for his superb leadership institutes for future and practicing educational leaders, once commented that education is not in crisis because schools are not what they were in the past. Instead, he argues, the schools too often try to function as they did in the past; but that becomes a problem when the world in which they exist is undergoing revolutionary changes (Barth, 1997).

As Barth suggests, many undergraduate institutions are conducting business as usual (lecture, exam, grade), with little or no effort to incorporate the development of skills and attitudes of self-directed learning or to prepare faculties to do so. Although the push for online learning has offered a rich opportunity for increasing SDL skills and attitudes, unfortunately, some faculty have simply transferred their normal practices to the online environment. Professional schools have been in the vanguard, driven by the demands of the workplace, where it is impossible to ignore the need for continuous, lifelong learning to avoid obsolescence.

Accreditation standards for many professions now require preparation programs to present evidence that they prepare their learners for continued, self-directed lifelong learning. Examples include medical education (American Council for Medical Education, 1993; Medical School Objectives Writing Group, 1999), engineering education (ABET, 2002; Litzinger *et al.*, 2005),

and nursing education (American Association of Colleges of Nursing, 2007). The driver for these standards is the rapid change that keenly affects these fields.

To provide just one example, the half-life of engineering knowledge—the time in which half of what an engineer knows becomes obsolete—is now in the range of two to eight years, according to the 2006 president of the National Academy of Engineering. However, the average career in engineering spans 40 years, mandating lifelong learning throughout the profession (Wulf & Fisher, 2002). Despite the addition of standards requiring demonstration of efforts to develop skills and attitudes for lifelong, self-directed learning, the Academy of Engineering president commented, “Today's engineering schools are not preparing their graduates as well as they might for useful practice in the 21st century” (Wulf & Fisher, 2002: 1).

One logical reason that professional schools are having a difficult time assisting their students to become more self-directed is that the students have not been prepared for the transition in their previous educational experiences. In fact, they have often been trained to be dependent learners who associate learning with preparation for a test or earning a grade. While the pursuit of knowledge and growth is a natural human tendency, the externally-imposed rewards and punishments usually associated with teacher-directed classrooms tend to diminish intrinsic motivation and the desire to take responsibility for one's own learning (Deci & Ryan, 2002).

Expanding on the work of Deci and Ryan, Pink (2009) examines 40 years of motivation research and concludes that our over-reliance on extrinsic motivation both in business and in education is not only outdated, but often harmful. Referring to externally-imposed rewards and punishments as “carrots and sticks,” he asserts that they “can often achieve precisely the opposite of their intended aims” (Pink, 2009: 35). He describes and gives examples of research illustrating that rewards and punishments can extinguish intrinsic motivation; diminish performance; crush creativity; crowd out good behaviour; become addictive; foster short-term thinking; and encourage cheating, shortcuts, and unethical behaviour (Pink, 2009: 59). In contrast, SDL approaches encourage intrinsic motivation, enhance performance, and are associated not only with creativity, but with a wide variety of other desirable characteristics.

Self-directed Learning Readiness as a Developable Capacity

Now that the need for SDL has been presented, it is important to establish that SDL readiness is a developable capacity—that appropriate interventions can increase learner readiness for self-

directed learning. A number of studies using the Self-Directed Learning Readiness Scale (SDLRS) (Guglielmino & Guglielmino, 2013) will be used to illustrate that point. While there are a number of ways to assess SDL skills and attitudes, the SDLRS is by far the most frequently used assessment (Merriam *et al.*, 2007). A few studies that support the premise that SDL readiness can be enhanced: Amey (2008) conducted pre-and post-tests on Social Work students involved in a clinical internship; Daniels (2011) used a web-based tutorial as a part of an innovative nursing program; both found students increased in SDL readiness. Dynan *et al.* (2008), in a business school, found that if students participated in instruction more closely aligned with their levels of readiness for SDL, their readiness was more likely to increase.

Among others employing educational approaches that resulted in increased SDL readiness, Gabrielle (Gabrielle *et al.*, 2006) introduced optional supplemental technology-based materials in required courses at a military college; Kasworm (1983) used a learning contract approach with supportive peer groups and mentoring in a graduate education class. In a well-regarded engineering undergraduate program, Litzinger (Litzinger *et al.*, 2005) incorporated problem-based learning; Posner (1990), in a cross-sectional study in an alternative high school noted higher levels of SDL among those who had completed more major independent learning projects; and Slaughter (2009), in a four-year study, tracked a gradual increase in SDLRS scores of pharmacy students who were involved in a partially problem-based curriculum.

Benefits and Correlates of Self-Directed Learning

Deci and Ryan (2002) in *The Handbook of Self-Determination Research* state that three basic needs must be met to achieve optimal motivation and well-being: autonomy, competence, and relatedness. Self-directed approaches in educational settings and in the workplace offer an ideal opportunity to attain all three. In fact, the findings of the research stream on self-determination theory (SDT) and the research stream on SDL reinforce each other, although the research efforts developed independently over approximately the same 40-year period. Pink (2009) assesses the outcomes of approaches that promote individual choice and responsibility (such as SDL) in terms of performance. He asserts, “The secret to high performance and satisfaction—at work, at school, and at home—is the deeply human need to direct our own lives, to learn and create new things, and to do better by ourselves and our worlds” (Pink, 2009:10). The research has indeed shown correlations between high levels of readiness for self-directed learning with life satisfaction and performance—both academic performance and performance in the workplace.

Self-directed learning readiness and life satisfaction

Life satisfaction has been found to correlate with higher levels of self-directed learning in a number of studies; among them, Brockett (1982), Curry (1983), Diaz (1988), and East (1986). Diaz found the highest correlations, with five of the eight subscales of the Conte-Salamon Life Satisfaction in the Elderly Scale showing correlations of more than .60 ($p > .0001$). For the other three subscales, the correlations were .45, .47, and .54 ($p > .0001$). Cohen's (1988) guidelines indicate that correlations of .30 and above are considered moderate and those .50 and above are considered large.

Self-directed learning readiness and academic achievement

Numerous studies have also shown correlations with academic achievement. Some examples: Gabrielle (Gabrielle *et al.*, 2006) introduced optional supplemental technology-based materials to 784 students enrolled in required courses at a military college and found that those who accessed the modules had increases in levels of readiness for SDL and higher grade averages than a control group and a second experimental group that had the opportunity to use the strategies, but did not access them. Long (1991), also using a sample of undergraduates, found a positive relationship between overall grade point average and SDLRS scores, concluding, "...Attitudes toward learning as measured by the SDLRS positively interact with quality of performance (as defined by gpa in school)" (Long, 1991: 117). Long and Smith (1996) examined 340 current students, recent graduates, and withdrawn students in a College of Liberal Studies bachelor's degree program and found a difference of nearly an entire standard deviation between the SDLRS scores of those who graduated and those who withdrew ($p < .0002$). They also noted that individuals who had been in the program longer than the average time needed for completion had a lower mean SDLRS score than the students who graduated in average time. Reio (2004), in a study investigating how prior knowledge, self-directed learning readiness, and curiosity impacted learning performance in a college classroom, found that "SDLR was by far the most robust predictor of learning performance after the possible confounding effects of age, gender, and ethnicity were controlled" (Reio, 2004: 22). Slaughter (2009), in a four-year study of students in a pharmacy preparation program, found that students with above average SDLRS scores performed better than those with lower scores. In addition to higher grade-point averages, they had higher on-time graduation rates and lower exclusion rates.

Self-directed learning readiness and workplace performance

Many studies have documented positive relationships between levels of readiness for self-directed learning and workplace performance in business, education, and public service. In 1981, the Self-Directed Learning Readiness Scale (SDLRS) (Guglielmino, 1978) was administered to a sample of 753 subjects, both managers and non-managers, in a large U. S. public utility that was undergoing extensive changes (Guglielmino *et al.*, 1987). The data indicated an overall relationship between workplace performance and SDL readiness. It also documented significantly higher SDLRS scores for individuals rated as *outstanding* or *more than satisfactory* than for those who received *satisfactory* ratings. When the SDLRS scores and performance ratings were examined in relationship to job characteristics, the outstanding performers who reported that their jobs involved a high degree of change or required high levels of creativity or problem-solving ability had significantly higher mean SDLRS scores than the means of other respondents. Conversely, there was a negative association overall between SDLRS score and level of routine work on the job (Guglielmino *et al.*, 1987).

When this study was replicated in a large Hong Kong utility company (Roberts, 1986) (n = 655) the results were quite similar. In addition, sufficient numbers of managers were included to determine that the SDLRS scores of managers were significantly higher than those of non-managers. Durr (1992) again confirmed the relationship between self-directed learning readiness and performance, the significantly higher scores of outstanding performers whose jobs involved a great deal of change and high levels of creativity and problem-solving, and the significantly higher SDLRS scores of managers as compared to non-managers. Durr's study, in a major U. S. electronics firm (n = 536), also established differences in mean SDLRS scores among occupational categories (Durr *et al.*, 1996). Jude-York's (1993) investigation linked organisational climate, self-directed learning readiness, and work performance.

A link between readiness for self-directed learning and performance is also substantiated by examining the groups who have attained the highest mean scores on the SDLRS during more than three decades of use: the top entrepreneurs in the U. S. (Guglielmino & Klatt, 1994), the top female executives in the U. S. (Guglielmino, 1996), female CEO's of nonprofit organisations (Liddell, 2008), and a select group of 10 school administrators whose innovative approaches to improving student reading achievement earned them top state-level recognition (Hillard, 2006).

Other correlates of self-directed learning readiness

Many other characteristics viewed as desirable in today's classrooms and workforce have been found to correlate quite strongly with SDLRS scores; for example: cross-cultural adaptability ($r = .69, p < .001$) (Chuprina & Durr, 2006); conscientiousness ($r = .61; p < .001$) (Oliveira & Simões, 2006); emotional intelligence ($r = .59, p < .01$) (Muller, 2007); strategic thinking ($r = .58, p < .001$) (Zsiga, 2007); and resilience ($r = .61; p < .001$) (Robinson, 2003), to name a few. Moderate correlations have been reported with creativity and flexibility (Cox, 2002; Torrance & Mourad, 1978a & b).

**The Challenge to Educators: Shifting the Paradigm of Teaching to Integrate
SDL into the Curricula of Formal Educational Institutions**

Despite documentation of the dramatic changes in our society, despite the research on motivation, despite the documented benefits of SDL, and despite the efforts of some outstanding educators, the standard approach to learning in most classrooms remains didactic instruction—predominantly lecture and test, perhaps with some discussion. The paradigm has not yet shifted. There are many possible reasons: the tendency to teach as one was taught; demands of high-stakes testing for “coverage” and memorisation (and school and teacher ratings based on test results); the ease of using or adapting old lecture notes and tests and assigning a grade based on primarily quantitative evaluation; increasing class sizes that make it more difficult to use authentic assessment; and, for higher education faculty, lack of instruction in teaching strategies.

Another barrier, even when faculty are ready to try new approaches, is student expectations. When they have been spoon-fed and prepared for tests on specific material, they may resist taking more responsibility for their learning and sometimes dealing with assignments that have no one right answer but provide better preparation for the lifelong learning and adaptation that will be required of everyone. Just as learning facilitators need assistance in adjusting to new approaches that will foster self-directed learning, students need information and *transition structures* to help them understand both the reasons for the new approaches and their roles in the new paradigm. Piskurich (2011) reported on negative student responses when a medical school faculty moved to a problem-based learning approach. The students, knowing they were facing comprehensive medical board exams, wanted to be told exactly what to memorise rather than gaining their knowledge by solving realistic problems. Incorporation of a simple intervention that helped them

to reflect on their roles as learners and the role of the learning facilitator provided an extremely effective transition structure.

The road to shifting the paradigm is long, but there are many avenues of approach. The following guidelines for integrating SDL into formal classroom settings in schools or workplaces have been developed over a number of years (see Table 1). They are based on research findings, experience of learning facilitators, and input from students. They should provide a place to begin or expand the paradigm shift for every learning facilitator who is interested in better preparing students for the learning demands in their futures.

Table 1:

Integrating SDL into the curriculum: Guidelines based on research and experience

- **Build a climate supportive of self-directed learning**
 - Present the urgent need for lifelong, self-directed learning (facts, figures on info-tech explosion, job changes, online learning opportunities, etc.).
 - Expect and respect individual input—create a partnership with the learner.
 - Value every question (There are no “stupid” questions).
 - Emphasize and positively reinforce acceptance of responsibility for one’s own learning.
 - Show your passion for and excitement in learning.
 - Don’t use red pens! Use green. Mistakes are a starting point, an opportunity for new learning--not a stop sign.

- **Promote individual awareness of self as a self-directing learner**
 - **Self-assessments**
 - Learning style assessments (What are my preferred ways of learning? What are my primary intelligences? Can I broaden?)
 - Assessment of self-directed learning readiness
 - **Awareness**
 - Ask learners to write down at least one thing they have learned on their own in the past year (previous learning projects that they may not have given themselves credit for).
 - In a group, have learners describe something they have learned on their own and how they learned it—then discuss the variety of projects and learning approaches (Watch the “aha’s” on others’ faces)
 - Have students interview each other about their learning projects.

- **Build in “transition structures.”**

- Change learning approaches gradually, increasing learner responsibility and choices.
- Use activities to give learners an opportunity to understand their roles as learners and the role of the learning facilitator (see Piskurich, 2011)
- Offer a variety of ways to demonstrate successful performance.
- Have the learners form teams for group projects.
- Use learning contracts listing objectives, possible resources and actions, timelines, and evaluation criteria (for individuals or teams).
- Schedule time for independent activities within the classroom.
- Incorporate seminar-style sessions in which learners share their new (self-directed) learning with others (including challenges and how they were overcome).

- **Address both sides of the learner's brain.**
 - **Use innovative and generative learning approaches to stimulate creativity.**
Samples:
 - Brainstorming
 - Questioning (not for recall)
 - Six Hats (Edward de Bono)
 - Creative writing
 - Scenarios, simulations
 - Experiments
 - Wrong-Way/Right-Way Role Plays

 - **Introduce problem-based learning, project-based learning, and field-based learning and build the skills to analyse and address problems.**
 - Problem identification
 - Planning
 - Resource identification
 - Evaluation of strategies and results
 - Identification of new questions

- **Provide support systems.**
 - Facilitator mentoring, assistance with resource identification, consultation
 - Peer mentoring systems
 - Learner support groups to discuss problems, challenges, successes (Kasworm, 1983 vs. Caffarella & Caffarella 1986)
 - Needs assessment techniques
 - Reference documents of frequently-asked questions (FAQ's)
 - Samples of previous products
 - Resource orientation and assistance, if necessary

- Library resource orientation—appropriate databases, customized search assistance
 - Internet searching orientation
 - Other appropriate resources—human or material
-
- **Encourage visualisation, reflection, metacognition, and thoughtful evaluation followed by new question formation.**
 - **Use assessment strategies that build SDL skills and abilities.**
(See Costa & Kallick, 2004)
 - **Celebrate progress! Recognise success!**
-

Unprecedented rates of change in all aspects of our lives mandate continual learning and re-learning. What worked in the classroom ten or twenty years ago is no longer sufficient. It is now essential that students leave their formal educational experience with a broader repertoire of skills, attitudes, and approaches. They will need to become highly self-directed learners—equipped to effectively continue to address their learning needs throughout their lives. If we continue, in this time of exponential change, to offer education as it was offered in the past, our educational systems will betray our learners.

References

- ABELES, V. 2010. *Race to nowhere: The dark side of America's achievement culture*.
[Documentary film]. Lafayette, CA: Reel Link Films.
- ABET (Accreditation Board for Engineering and Technology). 2002. Criteria for accrediting engineering programs: Effective for evaluations during the 2002–2003 accreditation cycle. [<http://www.abet.org/images/Criteria/2002-03EACCcriteria.pdf>] [Date of access: 14 December, 2007].
- AMERICAN COUNCIL FOR MEDICAL EDUCATION. 1993. Educating medical students: Assessing change in medical education – The road to implementation (ACME-TRI report). *Academic Medicine*, 68(6) (supplement).
- AMERICAN ASSOCIATION OF COLLEGES OF NURSING. 2007. The essentials of baccalaureate education for professional nursing practice. [<http://www.aacn.nche.edu/Education/pdf/BaccEssentials98.pdf>] [Date of access: 3 January, 2007].
- AMEY, B.E. 2008. An exploration of the relationship between experiential learning and self-directed learning readiness. (Doctoral dissertation, Florida Atlantic University).
- BARTH, R. 1997. *The principal learner: A work in progress*. Cambridge, MA: International Network of Principals' Centers, Harvard Graduate School of Education.
- BROCKETT, R. G. 1982. Self-directed learning readiness and life satisfaction among older adults (Doctoral dissertation, Syracuse University, 1982). *Dissertation Abstracts International*, 44: 42A.
- CAFFARELLA, R., & CAFFARELLA, P. (1986). Self-directedness and learning contracts in adult education. *Adult Education Quarterly*, 36, 226-234.
- CHUPRINA, L., & DURR, R. 2006. Self-directed learning readiness as a predictor of cultural adaptability in expatriate managers. *International Journal of Self-Directed Learning*, 3 (1): 13-23.
- COHEN, J. 1988. *Statistical power analysis for the behavioral sciences* (2nd ed.). New Jersey: Lawrence Erlbaum.
- COX, B, F. 2002. The relationship between creativity and self-directed learning among adult community college students (Unpublished doctoral dissertation, University of Tennessee).
- COSTA, A. L., & KALLICK, B. (2004). *Assessment strategies for self-directed learning*. Thousand Oaks, CA: Corwin Press.

- CURRY, M. 1983. The analysis of self-directed learning readiness characteristics in older adults engaged in formal learning activities in two settings (Doctoral dissertation, Kansas State University, 1983). *Dissertation Abstracts International*, 44: 1293A.
- DANIELS, E. B. 2011. The impact of an educational intervention on self-directed learning readiness and behaviors in undergraduate nursing students. (Doctoral dissertation, Capella University).
- DECI, E, & RYAN, R. (eds). 2002. *The handbook of self-determination research*. Rochester, NY: University of Rochester.
- DIAZ, P.C. 1988. Life satisfaction and learner self-direction as related to ethnicity in the older adult (Doctoral dissertation, Ohio State University, 1988). *Dissertation Abstracts International*, 44: 1293A.
- DURR, R.E. 1992. An examination of readiness for self-directed learning and selected personnel variables at a large Midwestern electronics development and manufacturing corporation (Doctoral dissertation, Florida Atlantic University). *Dissertation Abstracts International*, 53: 1825.
- DURR, R., GUGLIELMINO, L., & GUGLIELMINO, P. 1996. Self-directed learning and occupational categories. *Human Resource Development Quarterly*, 4:349-358.
- DYNAN, L., CATE, T., RHEE, K. 2008. The impact of learning structure on students' readiness for self-directed learning. *Journal of Education for Business*, 84(2):96-100.
- EAST, J. 1986. The relationship between self-directed learning readiness and life satisfaction among the elderly (Doctoral dissertation, Florida State University, 1986). *Dissertation Abstracts International*, 47: 2848A.
- FRIEDMAN, T.L. 2005. *The world is flat*. New York, NY: Farrar, Straus, & Giroux.
- GABRIELLE, D.M., GUGLIELMINO, L.M., & GUGLIELMINO, P.J. 2006. Developing self-directed learning readiness of future leaders in a military college through instructional innovation, *International Journal of Self-Directed Learning*, 3(1):24-35.
[<http://sdlglobal.com/journals.php>] [Date of access: 7 May 2013].
- GUGLIELMINO, L.M. 1978. Development of the self-directed learning readiness scale. (Doctoral dissertation, University of Georgia, 1977). *Dissertation Abstracts International*, 38: 6467A.
- GUGLIELMINO, L.M. 1996. An examination of self-directed learning readiness and selected demographic variables of top female executives. In LONG, H.B. & ASSOCIATES (eds). *Current developments in self-directed learning*. University of Oklahoma, College of Education: Public Managers Center: 11-22.

- GUGLIELMINO, L. 2008. Why self-directed learning? *International Journal of Self-Directed Learning*, 5 (1):1-13. [<http://sdlglobal.com/journals.php>] [Date of access: 7 May 2013].
- GUGLIELMINO, L.M., & GUGLIELMINO, P.J. 2013. *Learning preference assessment*. [<http://www.lpasdlrs.com/>] [Date of Access: 7 May, 2013].
- GUGLIELMINO, P.J., GUGLIELMINO, L.M., & LONG, H.B. 1987. Self-directed learning and performance in the workplace. *Higher Education*, 16:303-17.
- GUGLIELMINO, P.J., & KLATT, L.A. 1994. Self-directed learning readiness as a characteristic of the entrepreneur. In H. B. LONG AND ASSOCIATES (eds). *New ideas about self-directed learning*. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma: 161-174.
- HILLARD, L.C. (2005). The elementary principal's role in promoting reading improvement. (Doctoral dissertation, Florida Atlantic University).
- INTEL. 2003. *Teach to the future. Project-based classroom: Bridging the gap between education and technology*. [Training materials for regional and master trainers].
Author.
- KASWORM, C. 1983. An examination of self-directed learning as an instructional strategy. *Innovative Higher Education*, 8: 45-54.
- KILPATRICK, M. 2010. Google CEO Eric Schmidt: "People aren't ready for the technology revolution." ReadWriteWeb [http://readwrite.com/2010/08/04/google_ceo_schmidt_people_arent_ready_for_the_tech] [Date of access: 7 May, 2013]
- JUDE-YORK, D.A. 1993. Organizational learning climate, self-directed learners, and performance at work (Doctoral dissertation, The Fielding Institute, 1991), *Dissertation Abstracts International*, 53: 2206.
- KNOWLES, M. 1975. *Self-directed learning: A guide for learners and teachers*. New York, NY: Association Press.
- LIDDELL, T.N. 2008. Self-directed learning of women executives of philanthropic organizations. *International Journal of Self-Directed Learning*, 5(1): 15-29. [<http://sdlglobal.com/journals.php>] [Date of access: 7 May 2013].
- LITZINGER, T., WISE, J., & LEE, S. (2005). Self-directed learning readiness among engineering undergraduate students. *Journal of Engineering Education*, 94(2). [http://findarticles.com/p/articles/mi_qa3886/is_200504/ai_n13636319/print] [Date of access: 7 May 2013].
- LONG H.B. 1991. College students' self-directed learning readiness and educational achievement. In LONG, H. B. & ASSOCIATES (eds). *Self-directed learning: Consensus*

- and conflict Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education: 107-122.
- LONG, H.B., & SMITH, S.W. 1996. Self-directed learning readiness and student success. In LONG, H. B. & ASSOCIATES (eds). *Current developments in self-directed learning*. Norman, OK: Public Managers Center, University of Oklahoma: 193-202.
- LYMAN, P., & VARIAN, H.R. 2003. How much information?
[[http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/ execsum.htm](http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm)]
[Date of access: 3 January, 2007].
- MEDICAL SCHOOL OBJECTIVES WRITING GROUP. 1999. Learning objectives for medical student education—Guidelines for medical schools: Report I of the medical school objectives project. *Academic Medicine*, 74(1):13-18.
- MERRIAM, S., CAFFARELLA, R., & BAUMGARTNER, L. 2007. *Learning in adulthood* (3rd ed.) San Francisco: Jossey-Bass.
- MULLER, K. 2007. Emotional intelligence and self-directed learning readiness among healthcare managers. (Doctoral dissertation, Florida Atlantic University). ProQuest AAT 3266421.
- OLIVEIRA, A.L., & SIMÕES, A. 2006. Impact of socio-demographic and psychological variables on the self-directedness of higher education students. *International Journal of Self-Directed Learning*, 3 (1): 1-12 [<http://sdlglobal.com/journals.php>] [Date of access: 7 May 2013].
- PINK, D. 2009. *DRiVE: The surprising truth about what motivates us*. New York, NY: Riverhead Books.
- PISKURICH, J. F. 2011. Fostering self-directed learning in medical school: When curricular innovation is not enough. *International Journal of Self-Directed Learning*, 8(2): 44-52. [<http://sdlglobal.com/journals.php>] [Date of access: 7 May, 2013].
- POSNER, F.G. 1990. A study of self-directed learning, perceived competence and personal orientation among students in an open alternative high school (Doctoral dissertation, University of Denver, 1989). *Dissertation Abstracts International*, 51: 813.
- REIO, T.J. 2004. Prior knowledge, self-directed learning readiness, and curiosity: Antecedents to classroom learning performance. *International Journal of Self-Directed Learning*, 1(1):18-26. [<http://sdlglobal.com/journals.php>] [Date of access: 7 May 2013].
- ROBERTS, D.G. 1986. A study of the use of the Self-Directed learning Readiness Scale as related to selected organizational variables (Doctoral dissertation, George Washington University, 1986), *Dissertation Abstracts International*, 47: 1218A.

- ROBINSON, M.G. 2003. The relationship between self-directed learning and resilience among graduate students (Doctoral dissertation, University of Tennessee, 2003). *Dissertation Abstracts International*.
- SLAUGHTER, R. 2009. Experience in the Doctor of Pharmacy Program at Wayne State University increases students' readiness for self-directed learning. Poster session presented at the annual conference of the American Association of Colleges of Pharmacy, Boston, MA.
- TOFFLER, A. 1974. *Learning for tomorrow: The role of the future in education*. New York: Random House. Retrieved from [<http://www.alvintoffler.net/?fa=galleryquotes>][Date of access: 7 May, 2013].
- TORRANCE, E.P. & MOURAD, S. 1978a. Some creativity and style of learning and thinking correlates of Guglielmino's Self-Directed Learning Readiness Scale. *Psychological Reports*, 43: 1167-1171.
- TORRANCE, E.P., & MOURAD, S. 1978b. Self-directed learning readiness skills of gifted students and their relationships to thinking creatively about the future. *The Gifted Child Quarterly*, 22: 180-186.
- UNESCO. 2009. CONFINTEA VI: Living and learning for a viable future. Final report. [<http://uil.unesco.org/home/programme-areas/lifelong-learning-policies-and-strategies/news-target/lifelong-learning/9bf043146eaa0985e05daa9e12135f5b>] [Date of access: 7 May 2013].
- WULF, W.A., & FISHER, G.M. C. 2002. Makeover for engineering education. *Issues in Science and Technology*. [http://www.issues.org/18.3/p_wulf.html] [Date of access: 7 May, 2013].
- ZSIGA, P. L. 2007. Self-directed learning readiness, strategic thinking, and leader effectiveness in directors of a national nonprofit organization. (Doctoral dissertation, Florida Atlantic University).

Lucy M. Guglielmino (lguglie@fau.edu) is Emeritus Professor of Adult and Community Education at Florida Atlantic University, U. S. A. and Extraordinary Professor at North-West University in South Africa. Best known for her *Self-Directed Learning Readiness Scale* (also called the *Learning Preference Assessment*) she chairs the Board of Directors of the International Society for Self-Directed Learning and is the editor of the *International Journal of Self-Directed Learning*.