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Preface

As the mandate for lifelong, self-directed learning becomes more widely understood, the urgent need for expanded understanding of the conceptualization and implementation of this construct becomes more evident.

In the opening article, Carré and Cosnefroy present a carefully-researched analysis comparing the closely-related constructs of self-directed learning and self-regulated learning and suggest that proponents and researchers in these areas have much to learn from each other—an article likely to spark a great deal of healthy discussion and research.

Strods focused his research on the promotion of self-directed learning in a teacher education context in Latvia. His article supports the inclusion of carefully crafted cooperative learning strategies as a means of developing self-directed learning readiness.

Morrison and Seaton address the rich and rapidly expanding world of the online Do-It-Yourself-Forum, described as “a new type of knowledge ecology.” They analyze in detail a representative site in order to expand understanding of the reciprocal role of knowledge seekers and knowledge contributors in this complex and infinitely varied self-directed learning context.

In the final article, Taylor, Trumppower, Atas, and Purse report on their exploration of the possibility of linkages between self-directed learning and social capital, using a newly-developed Social Capital Inventory.

We hope that this issue brings something to pique your interest, contribute to your understanding, or inspire you to further research on self-direction in learning, an essential requirement in the 21st century.

Lucy Madsen Guglielmino, Editor

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SELF-REGULATED AND SELF-DIRECTED LEARNING: WHY DON'T SOME NEIGHBORS COMMUNICATE?

Laurent Cosnefroy and Philippe Carré

In connection with the ever-growing necessity of autonomous lifelong learning, psychological and educational research abounds with a plethora of *self* constructs. Among these, concepts that appear closely related seem to be used in complete ignorance of one another, thus appearing to operate within clearly segmented areas of empirical and academic subcultures. This paper examines two major constructs – self-regulated and self-directed learning – in order to (a) define them and establish their conceptual proximity and differences; (b) document the absence of links between them in the relevant literature(s); and (c) suggest three possible explanations for this mutual ignorance among close scientific kin.

Keywords: self-directed learning, self-regulated learning, self-determination, self-efficacy, metacognition, autodidaxy, autonomy

In the Western world today, there is overwhelming agreement among researchers, managers and policy-makers alike about the need for a more autonomous workforce in order to face the daunting challenges of work in an emerging cognitive society (Commission Européenne, 1995; OCDE, 2000; Cedefop, 2003). The growing demands of technological advance in an age of exploding information and globalized business challenges highlight the increasingly rampant need for continuous, day-to-day maintenance and upgrading of one's knowledge, skills, and attitudes. As a consequence, salaried employees are and will be more and more systematically encouraged (and often requested) to manage a significant share of their lifelong professional learning and development *by themselves*, whether in situations that are formally organized for training and educational purposes or not (Carré, 2005).

Parallel to the promising visions of lifelong learning and the autonomous knowledge worker that have emerged in most Western countries over the last 50 years, the literature in the relevant fields of adult education, vocational training and educational psychology has evidenced a striking intensification of interest in self-learning concepts. More than 20 years ago, Carré (1992) conducted an initial search which produced no less than 15 notions used in the adult education literature in relation to autonomous learning: *autonomous learning, independent learning, self-directed learning, self-managed learning, self-organized learning, self-regulated learning, self-determined learning, self-planned learning, self-initiated learning,*

self-learning, self-education, self-instruction, self-teaching, autodidaxy, and autodidactic learning. Among these, a preliminary count in the major educational databases (Carré & Cosnefroy, 2011) identifies two leaders: *self-directed learning* (hereafter SDL) and *self-regulated learning* (hereafter SRL). We will begin by defining each of them while attempting to point out their conceptual similarities and differences. Then, we will document the links (or absence thereof) between these two constructs in the relevant bodies of literature. Finally, we will offer three possible explanations in order to try to account for this mutual ignorance among close scientific kin.

SDL and SRL as Close Neighbors

Definitions and Scope Analysis

For the layperson, there is little doubt that, semantically speaking, SDL and SRL are close neighbors and could be considered as synonymous. Even scholars in educational psychology have suggested that the terms *self-directed learning* and *self-regulated learning* have often been used interchangeably in the literature (Loyens, Magda, & Rikers, 2008). Indeed, “[a]t first sight, SDL and SRL seem highly similar” (Jossberger, Brand-Gruwel, Boshuizen, & van de Wiel, 2010, p. 417), and several recent articles use both notions indifferently, as if they were accepted synonyms (Abar & Loken, 2010; Francom, 2010). As we shall see, seminal definitions of both terms point to a large amount of notional overlap.

A widely accepted conceptual foundation of SDL is Knowles’ (1975) definition:

In its broadest meaning, self-directed learning describes a process in which individuals take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (p. 18)

Twenty years later, Long (1991) concurred: “I define self-directed learning as a personally directed purposive mental process usually accompanied and supported by behavioral activities involved in the identification and searching out of information” (p. 15).

At about the same time, Zimmerman (1989) proposed:

In general, students can be described as self-regulated to the degree that they are metacognitively, motivationally, and behaviorally active participants in their own learning process. Such students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction. To qualify specifically as *self-regulated* in my account, students’ learning must involve the use of specified strategies to achieve academic goals on the basis of self-efficacy perceptions. This definition assumes the importance of three elements: students’ self-regulated learning strategies, self-efficacy

perceptions of performance skill, and commitment to academic goals. (p. 329)

Zimmerman's model of SRL is probably among the most popular. Other models, such as those elaborated by Corno (2001), Boekaerts (1997), Winne (Winne & Hadwin, 1998), and Pintrich (2004), focus on a variety of different aspects of SRL (cf. Cosnefroy, 2011). Boekaerts' model emphasizes emotional aspects, Corno's the volitional aspect, and Winne's model underscores the cognitive aspects of SRL. Whichever the model, all assume that SRL implies directing one's learning by setting goals, monitoring the learning process, and using various cognitive and volitional strategies (Boekaerts & Corno, 2005; Pintrich, 2004).

These first definitions point to the similarity of the two concepts, both aimed at describing the various dimensions of independent, agentic management of one's learning efforts. Loyens et al. (2008, p. 417) note, "Overall, both SDL and SRL involve active engagement and goal-directed behavior." According to Pilling-Cormick and Garrison (2007), SDL and SRL both address issues of responsibility and control in learning.

A Three-Dimensional Contrast

Upon closer examination, however, these close conceptual neighbors appear noticeably different. Three of their properties account for the dissemblance: their dominant scientific field of reference, the category of learner population they are concerned with, and, most importantly, their scope of application in the learning process. A first, exploratory look at the sparse literature that relates to both constructs and to dominant patterns of research in each of the two fields reveals a strikingly contrasted situation which can be summed up in the following chart (Carré & Cosnefroy, 2011) (Table 1).

Table 1. *SDL and SRL: A Hypothetical Proposition of Differentiation*

	Self-Directed Learning	Self-Regulated Learning
Field of Reference	Adult education	Educational psychology
Dominant Population	Adult learners	Children, adolescents, students
Scope of Application	Learning projects	Learning activities

As noted in previous reviews (Loyens et al., 2008, p. 418) "The adult education roots of SDL give this concept a history in learning outside school environments. . . . SRL, on the other hand, has been studied within school learning." This first element accounts for two significant differentiating factors between both research traditions: SRL is mostly concerned with school-based learning, hence mostly studied by educational psychologists, while SDL, since its foundation, has been inspired by adults at grips with continuous formal or informal learning after their school years and hence has been mostly analyzed by adult education specialists. Lastly, and most significantly, SRL and SDL are supposed to

vary widely as to their scope within the larger field of research into learning. Loyens et al. (2008) state,

Clearly, both SDL and SRL carry an element of student control. However, the degree of control the learner has, specifically at the beginning of the learning process when the learning task is defined, differs in SDL and SRL. In SDL, the learning task is always defined by the learner. A self-directed learner should be able to define what needs to be learned. . . . In SRL, the learning task can be generated by the teacher. . . . In this sense, SDL can encompass SRL, but the opposite does not hold. (p. 418)

Conversely, this distinction also implies that SDL requires SRL: one needs self-regulation to become a capable self-directed learner. Zimmerman, for instance, studied the techniques used by skillful writers. He described self-regulation of writing as a kind of SRL that appears outside a formal educational setting and in which the learning task is defined by the learner (Zimmerman & Risemberg, 1997). Nevertheless, research on SRL has mainly focused on the *how* of the self-regulation: how do students get what they want? That is, how do students keep themselves on track toward their desired outcomes (Pintrich, 2003; Reeve, Ryan, Deci, & Jang, 2008)?

Due to its origins in educational psychology's studies of learning efforts of youth within the school system, SRL primarily investigates strategies, skills and attitudes favorable to an effective *learning activity* in constrained academic situations where the wider goals do not belong to the learners themselves. In contrast, investigations of SDL have been carried out by adult education specialists who, following the tradition of Tough's notion of *learning projects*, have been mostly concerned with out-of-school, independent learners as the prime decision-makers of self-determined educational endeavors. The difference lies in the ownership of the learning project, which rests, almost by definition, with the learner in SDL; while it could be controlled externally in SRL. In other words, while agency is at the core of both concepts, it applies to the larger distal goals in SDL but is restricted to proximal learning goals in SRL. The self-directed learner controls the learning trajectory as a whole, whereas the self-regulated learner's control is restricted to the learning activity. We agree with Loyens et al. (2008) in stating that SDL can (and should) imply SRL, but the reverse is not true.

On the theoretical front, we reached a similar conclusion in our attempt to articulate SDL and SRL concepts by referring to Deci & Ryan's (2002) concept of self-determination. We may thus characterize SDL as both self-regulated *and* self-determined, while SRL may concern both self-determined and externally controlled acts of learning.

Table 2 shows subcategory possibilities when crossing setting goals and achieving goals. Self-determination here means that the learners make their own decisions when choosing their options in education and training. In the case of external control, the goals are set by teachers and the learners identify a learning opportunity that may trigger a high level of self-regulated learning (controlled

SRL) or a low level of self-regulated learning (other-directed learning), depending on the characteristics of the learning situation.

Table 2. *Self-learning Concepts (Carré, 2010)*

	Self-determination	External control
High level of self-regulation	Self-directed learning (self-determined + self-regulated)	Controlled self-regulated learning
Low level of self-regulation	Externally regulated, self-determined learning	Other-directed learning

Self-regulated learning is viewed as a continuum depending on the level of choices allowed to the student in terms of methodology, resources, or study time. As stated by Winne (1995), self-regulated learning is a cognitively inherent aspect of learning. Through the process of metacognitive monitoring the learner always makes decisions and controls his or her learning, albeit with a varying degree of engagement and success. Moreover, whatever the source of goals and the characteristics of the learning situation, goals often require protection and maintenance if they are to be met (Corno, 1993). In this sense, lack of self-regulated learning cannot really occur even though the learning situation is strongly defined by the teacher and curtails the learner’s choices. This is the reason why we used low level of self-regulation instead of lack of self-regulation in Table 2.

Finally, the distinction between SDL and SRL nicely fits in the Rubicon model of action phases elaborated by Heckhausen (Heckhausen & Gollwitzer, 1986). This model capitalizes on Lewin’s distinction between goal striving and goal setting (Lewin, Dembo, Festinger, & Sears, 1944). Goal striving is behavior directed toward existing goals, whereas goal setting addresses the issue of what goals a person will choose. Heckhausen has included these two problems into a single theoretical model that allows us to study the two steps in relation to each other and to introduce a temporal perspective by distinguishing four phases, from deliberation to evaluation of action. Goal striving is related to volition, goal setting to motivation. Being focused on the *how* of self-regulation, SRL theories enhance the volitional part of the learning process, whereas SDL theories focus on the deliberating phase of learning.

Meta-Documentary Research

Aims

Given this triple difference, one could expect SDL and SRL researchers to collaborate so as to conduct studies together that combine their complementary characteristics: learners (school population vs. adult learners), approaches (educational psychology vs. adult education) and scope (learning activities vs. learning projects). The purpose of this empirical part of our research was to evaluate the amount of collaboration between SDL and SRL researchers, based on the amount of published material that uses both concepts jointly. Our hypothesis

was that cross-references using both SRL and SDL concepts would be minimal in the relevant literature(s). We have put this hypothetical statement to the test of a systematic documentary investigation.

Method

This meta-documentary research was based on a full literature search using SDL and SRL as key words in two authoritative databases in education psychology and educational science: Education Research Complete® (hereafter ERC) and ERIC®. The frequency and nature of hundreds of publications using them have been analyzed over a period of 10 years (2000-2010) and the evolution of each series (self-regulated v. self-directed learning) compared to the other. Cross-uses and interfaces between the concepts (or the lack thereof) have also been studied. Quotation marks around SDL and SRL have been used in each query to find an exact match.

Findings

Evolution Of Each Research Field

We first scrutinized the evolution of studies referring to SDL or SRL from 2000 to 2010 (Table 3).

Table 3. *Evolution of Research on SDL and SRL from 2000 to 2010*

	SRL		SDL	
	ERIC	ERC	ERIC	ERC
2000	136	105	668	136
2010	546	636	1049	604
2010/2000	x 4.01	x 6.06	x 1.57	x 4.44

The last row displays the increase rate between 2000 and 2010. The results showed a large increase in both fields. However, a combined search using both SDL and SRL as keywords only provided nine entries between 2000 and 2010 for ERIC and five entries for ERC. In line with our hypothesis, the results support the view that SDL and SRL are two parallel research fields with little or no connection.

Specificities of Each Concept

We then used extra keywords combined with SDL and SLR in order to specify each concept. More specifically, it was hypothesized that target populations and theoretical framework are largely dissimilar in each field.

Target populations. Table 4 displays the results when adding *adults* (or *adult learning*, which leads to the same results) and *academic achievement*. The percentages refer to the number of studies linking adults or academic achievement

with SDL or SRL compared with the overall number referring to SDL or SRL indicated in Table 1.

Table 4. *Proportion of Studies Linking SDL and SRL to Adults and Academic Achievement*

SRL + Adults		SDL + Adults		SRL + Academic Achievement		SDL + Academic Achievement	
ERIC	ERC	ERIC	ERC	ERIC	ERC	ERIC	ERC
25	17	531	250	154	92	40	15
4.6%	2.7%	50.6%	41.4%	28.2%	14.4%	3.9%	2.5%

First, one should note that SDL is much more closely linked to adults than SRL. Conversely, SRL is more linked to academic achievement than SDL. It is worth pointing out that about half of the studies relying on SDL are matched with *adults*; whereas the relationships between SRL and academic achievement are considerably weaker.

Even though ERIC and ERC display different numbers of occurrences (especially for *SDL + Adults*), the ratios are quite close: ERIC displays 11 times more studies linking SDL and adults than studies linking SRL and adults. For ERC, this ratio increases to 15 times more. In addition, one should note that ERIC databases display 6.13 times more studies linking SRL and academic achievement than those linking SRL and adults. It also provides 12.97 times more studies linking SDL and adults than those linking SDL and academic achievement. The ERC database provides 5.33 times more studies linking SRL and academic achievement than those linking SRL and adults. It also displays 16.56 times more studies linking SDL and adults than those linking SDL and academic achievement.

Regardless of what databases are being used, it is clear from the results presented above that SDL is a concept used more frequently in the adult education domain. Its links with school and high school appear to be very scarce.

Theoretical framework. Research on SRL is rooted in cognitive psychology. As stated by Winne (1996), research on metacognition and cognitive strategy “has built a broad platform for newer and increasingly more active work in SRL” (p. 327). Capitalizing on metacognitive theory, the SRL paradigm calls for expanding the study of learner activity by combining the investigation of cognitive, metacognitive and motivational processes in order to achieve a better understanding of autonomous learning (Cosnefroy, 2011).

As a consequence, we can hypothesize that relationships between SRL and metacognition will be more important than those between SDL and metacognition. Likewise, we hypothesize that a similar picture will be found regarding the relationships that SRL and SDL share with *self-efficacy*, a key concept in motivational research. Table 5 displays the occurrences to be found when

combining SDL, SRL and *metacognition*. The percentages were computed by dividing these occurrences by the whole number of studies devoted to SDL and SRL in 2010 as indicated in Table 3 (second row). SDL is hardly ever linked with metacognition, as compared with SRL, for which the percent rises to 29.7% (ERIC database).

Table 5. *Studies Linking SRL and SDL to Metacognition in 2010*

SRL + Metacognition		SDL + Metacognition	
ERIC	ERC	ERIC	ERC
162	104	32	4
29.7%	16.4%	3%	0.7%

Again, significant differences can be observed when considering SDL and SRL’s respective relationships with self-efficacy (Table 6).

Table 6. *Studies Linking SRL and SDL to Self-Efficacy in 2010*

SRL + Self-efficacy		SDL + Self-efficacy	
ERIC	ERC	ERIC	ERC
128	102	17	20
23.4%	16.0%	1.6%	3.3%

Although the range of the differences appears to be less marked in ERC than in ERIC, the results lead to the conclusion that self-efficacy has clearly been more often associated with SRL than with SDL.

SRL, SDL and Self-Determination

SRL and SDL theories both attempt to understand what it means to be an autonomous learner. Autonomy is also at the core of a leading motivational theory. Self-determination theory (hereafter SDT) makes a distinction between autonomous and controlled self-regulation. The former is a self-endorsed regulation, the sense that one’s actions stem from oneself and are one’s own, whereas the latter means that the person’s behavior is regulated by coercive forces outside the self (Deci & Ryan, 2002). The scope of the SDT goes beyond learning to include all domains in which self-regulation plays an important role (e.g., work, health, leisure). However, SDT has also been used in the area of learning, more specifically to address the interpersonal conditions that support students’ experience of autonomy (Reeve, 2009; Reeve et al., 2008). Since SRL, SDL and SDT share a common focus on autonomy, one could hypothesize that studies on SRL and SDL use concepts present in SDT. Therefore, we crossed SDL and SRL with the keyword *self-determination*. Surprisingly, this crossing of SRL and SDL with self-determination leads to as few occurrences for SRL as for SDL. In 2010, we only found seven studies linking SRL and SDT and fourteen studies linking SDL and SDT in the Eric databases (respectively 14 and 23 in the ERC databases).

Two Parallel Worlds?

As shown above, there has been a significant increase in research on SDL and SRL from 2000 to 2010. The studies refer to one or the other but hardly ever to both concepts together, as if the research belonged to two parallel worlds without any connection. Likewise, there is a patent lack of connections with SDT, another theory that also focuses on autonomous self-regulation. Secondly, a cross-index query using such keywords as *adults, academic achievement, metacognition, and self-efficacy* has shown that each concept uses a specific set of related concepts. SDL is more often associated with adult learning, while maintaining a lesser relationship with academic achievement, metacognition, and self-efficacy. SRL, on the other hand, is more often linked with academic achievement, metacognition, and self-efficacy, while its links with adult learning are marginal. These results support the assumption of two different theoretical frameworks being used in research on SRL and SDL. As SRL is situated midway between cognition and motivation, it is congruent that research on SRL should refer to both metacognition and self-efficacy. On the contrary, constructs issued from cognitive and motivational psychology seem to be seldom used in SDL research.

Conclusion: Three Combined Reasons Why Some Neighbors Don't Communicate

It is hypothesized that three reasons account for the fact that such close conceptual neighbors don't communicate – namely institutional differences, epistemological barriers, and scientific power issues. First, as shown in the present article, SRL and SDL, although true contemporaries in terms of their emergence in the educational literature, originated in different fields of practice, research groups, and professional milieus. SRL appeared in connection with research on academic achievement (hence in schools and, to a lesser extent, higher education), whereas the roots of SDL are to be found in studies of adult learning. This first distinction accounts for the fact that researchers, practitioners, readers and potential users of the corresponding theories have seldom found common ground or circumstances to exchange ideas, concepts and experience relative to their (unbeknownst to them) common interest in various forms of learner autonomy.

From a complementary epistemological point of view, we have also noted that SRL has mainly been studied within educational psychology, whereas SDL developed as a research topic within adult education. This second institutional divide, this time between university departments, reinforced mutual ignorance among faculty and students of both families. Respect for (or fear of) disciplinary frontiers may also have been reinforced by the classical phenomenon of paradigmatic closure, which Kuhn brought to light (Kuhn, 1962). For coherent members of a given scientific community, such as educational psychologists studying SRL or adult education scholars invested in SDL research, a certain proportion of mutual ignorance may be accounted for by the fact that new, unfamiliar paradigms of research bearing on objects similar to one's own produce

an unsettling amount of theoretical dissonance. Putting one's slowly accumulated knowledge about a given concept to the test of a foreign discipline's unfamiliar expertise may be a harder and harder move to make as one progresses in scholarly expertise and mentorship.

Almost as a consequence of the preceding remarks, one could consider the lack of interaction between SRL and SDL as a key instance of scientific competition between rival academic groups. Following such a radical sociology of science hypothesis, ignorance or oblivion of potential scientific partners protects agents against the risk of losing a share of power in the quest for symbolic capital that defines intellectual and scientific professions even more than in many other trades (Bourdieu, 1991).

SRL and SDL are close, specific, and complementary concepts situated within a rich network of common theoretical issues and practical challenges. Whether for institutional, epistemological or sociological reasons, scholars interested in either concept hardly interact at all at the conceptual, methodological or practical interfaces that link them. Our hope is that the present article will contribute to a significant increase in communication, mutual knowledge, and collaboration between such (so far) unrelated neighbors.

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PROMOTION OF STUDENT SELF-DIRECTION THROUGH COOPERATIVE LEARNING IN TEACHER TRAINING

Gunars Strods

This article presents results of implementation of principles of self-directed learning in a university teacher preparation program through cooperative learning. After an educational model for promotion of student self-directed learning skills was developed and implemented in the university teacher preparation program, this study was designed to explore the relationships between the cooperative learning process that was piloted and the students' self-directed learning development. The study ($N = 170$) compared data from an experimental group with control group data. Empirical data were collected using the Self-Directed Learning Readiness Scale (SDLRS) and written student self-assessment questions at the beginning and the end of the semester, as well as structured interviews with 11 students who participated in one of the cooperative learning groups. Results suggest that self-directed learning readiness improves through cooperative learning processes for students at all levels of readiness.

Keywords: self-directed learning, cooperative learning, teacher education, SDLRS, Latvia

The European Commission white paper *Teaching and Learning: Towards the Learning Society* (1995) stems from the observation that the changes currently in progress have improved access to information and knowledge, but have simultaneously required considerable adjustments in working patterns and required skills. The society of the future will be a learning society. In light of this, it is evident that education systems, particularly those responsible for the education of teachers and trainers, have a central role to play (European Commission, 1995, 2001, 2010; Faure, 1972). The learning society demands self-directed learning skills and high collaboration.

Self-directed learning has various definitions. All definitions characterize the self-directed learner as responsible for his or her own learning and for the organization of the learning process (Bolhuis, 1996; Knowles, 1975). Learning needs to change from being teacher-directed to being increasingly student self-directed. To become a self-directed learner requires change from following the instructions of others to creating one's own tasks (Long, 2009). According to Gibbons (2002), the five stages of movement from teacher-directed to self-directed learning include (a) incidental self-directed learning, (b) learning to think independently, (c) self-managed learning, (d) self-planned learning, and (e) self-directed learning. Self-directed learners are more self-confident about their ability, making the learning process meaningful and self-monitoring (Garrison, 1997).

Previous research has indicated that curricular interventions can lead to increases in readiness for self-directed learning. Examples include the use of problem-solving approaches (Litzinger, Wise, & Lee, 2005; Slaughter, 2009); supplemental technology-based approaches (Daniels, 2011; Gabrielle, Guglielmino, & Guglielmino, 2003); project-based learning (Posner, 1991); and experiential learning (Amey, 2008). It has also been asserted that cooperative learning provides the opportunity for development from teacher-direction toward self-direction, promoting students' self-directed learning skills development (Beckett & Hager, 2002; Corno, 1992; Helds, 2006; Strods, 2006). Further research is needed to determine the accuracy of this statement.

The Cooperative Learning Model

An educational model for student self-directed learning readiness promotion was developed, based on implementation of principles of self-direction in cooperative learning (Colley, Hodkinson, & Malcolm, 2002; Eraut, 2000; Gibbons et al., 1980; Livingstone, 2001; Merriam, Caffarella, & Baumgartner, 2007). Eight principles for implementation were adapted from Veide's (1998) description of direction and liberalization in secondary school by Strods (2006). These *Principles Leading to Self-Direction* are listed below.

1. The training plan and the learning outcomes of courses can be modified by the students and educator according to the students' needs.
2. It is reasonable to establish time and content limits, but students do not necessarily complete the task similarly or at the same time.
3. Many of the topics include a variety of scientific disciplines, so different subject combinations in more lasting projects are often more successful than adherence to strict demarcation of the subjects.
4. A variety of methods prompted by the topic, imagination of the educator, knowledge of the nature of communication, and sensitivity to students should be used.
5. Small groups of students choose how to complete the task or answer the research question, when and how to present group results, and the process of collaboration. Necessity for mandatory or compulsory learning does not arise if students can choose preferred methods and focus.
6. Students agree upon rules of cooperation. The fewer restrictions on student behavior, the more feelings of responsibility, solidarity, equality and independence of the student increase.
7. The community conducts the needs assessment--not only the student. Assessment should be non-discriminatory and based on evaluation of task results and group interaction, peer evaluation, and self-evaluation.
8. Praise can facilitate learning if it is genuine. (Strods, 2006)

Implementation of principles of self-direction and liberalization in the study process occurs when educators and students agree on common learning processes (Ramsden, 1992; Rogers, 2003, 2004; Rudzītis, 2003; Senge, 1990; Smith, 1999, 2003). The educator discusses with the students expected learning outcomes and helps the students define group and individual learning outcomes. Learning tasks in challenging situations encourage students to recognize their strengths and weaknesses and motivate

them to complete the given task. Cooperative learning groups of three students develop the execution plan, which includes a description of each member's individual responsibility as well as learning outcomes in the final presentation.

Group size is based on Newcomb's (1953) and Festinger's (1957) cognitive orientation of small group theory. Human knowledge cannot be separated from behavior. Humans behave in compliance with a cognitive framework, but team members use interpersonal relations to balance the cognitive framework. Cognitive frameworks consist of social perception, attraction, attitudes, and knowledge. If a pair or a group has a difference in their cognitive frameworks, the frequency of communication in the group increases. Frequency and content of communication in a triad keeps the group in balance and cohesive.

During the task students must adjust and analyze the process of cooperation: frequency, type, and content of communication. Evaluation and analysis of the collaborative process in group work is an indispensable part of the learning task (Dunne & Bennet, 1996; Mandl & Reinmann-Rothmeier, 1995; Watkins & Marsick, 1993). The instructor organizes evaluation of student learning outcomes and, based on these outcomes, sets up a new, challenging learning situation. Group participants for some tasks are self-selected; but for others, by the instructor. Throughout the semester students work in groups for short and long terms—one week or for the semester. Groups are organized based upon gender, age, learning style, residence, etc. Heterogeneity of group mates demands communication and planning for individual contribution (Cohen, 1994).

Several cooperative learning strategies and modifications of strategies were implemented to comply with basic elements of cooperative learning:

1. Positive interdependence

- Students must fully participate and put forth effort within their group.
- Each group member has a task/role/responsibility; therefore each must believe that s/he is responsible for the group's learning as well as for personal learning.

2. Face-to-face interaction

- Group mates promote each other's success.
- Students explain to one another what they have learned or are learning and assist one another with understanding and completion of assignments.

3. Individual accountability

- Each student must demonstrate mastery of the content being studied.
- Each student is accountable for his or her learning and work, therefore eliminating "social loafing."

4. Social skills

- Social skills must be taught in order for successful cooperative learning to occur.
- Skills include effective communication, interpersonal and group skills: leadership, decision-making, trust-building, communication, and conflict-management.

5. Group processing

- On a regular basis, groups must assess their effectiveness and decide how it can be improved (Bennett, Rolheiser-Bennett, & Stevahn, 1991; Brown & Ciuffetelli, 2009; Johnson & Johnson, 1993).

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The stages or degrees of movement from entirely teacher-directed learning toward self-directed learning include the following:

- *Incidental self-directed learning*
The occasional introduction of self-directed learning activities into courses or programs that are otherwise teacher-directed (e.g. individual projects, stations, or brief introduction of any other forms of self directed learning on the spectrum) begins the journey toward self-direction.
- *Learning to think independently*
Facilitating students' independent thinking is accomplished through courses or programs that emphasize the personal pursuit of meaning through exploration, inquiry, problem-solving, and creative activity (e.g. debates, case studies, investigations, trials, dramatizations, fieldwork).
- *Self-managed learning*
Courses or programs can be presented through learning guides that students complete independently.
- *Self-planned learning*
Even if the outcomes are preset, students can pursue course outcomes through activities they design themselves.
- *Self-directed learning*
In self-directed learning, students choose the outcomes, design their own activities and pursue them in their own ways (Based on Gibbons, 2002, 2004, 2008).

Cooperative learning situations include incidental self-directed learning, independent thinking, setting of learning targets and planning their achievement, problem solving, and presentation of achievements. Students equally collaborate with each other and the educator during classes in university and outside. The type of cooperative learning implemented for students' self-directed learning promotion complies with the description of informal cooperative learning. It incorporates group learning with passive teaching, drawing attention to material through use of small groups throughout the lesson or by discussion at the end of a lesson. Group discussions typically have four components: formulating a response to questions asked by the educator, sharing responses to the questions asked with a partner, listening to a partner's responses to the same question, and creating a new, well-developed answer. (Johnson, Johnson, & Holubec, 1988; Mandl & Reinmann-Rothmeier, 1995). This type of learning enables the student to process, consolidate, and retain more information.

Gibbons (2009) notes a transition from teacher-directed to self-directed learning in the cooperative learning study process model corresponding to the third and fourth degree in a self-managed and self-planned learning situation. Based upon Gibbons' third and fourth levels, I developed an educational model for promotion of cooperative learning and student self-directed learning skills, seen in Figure 1, which was implemented in teacher training programs and adapted as part of a experiment (Strods, 2003, 2006).

The volume of independent study at university demands that students have self-directed learning skills. However, there is an observed discrepancy between student readiness to act and performance requirements. On the one hand, pedagogy students experience contradiction between the ideals of the teaching profession and reality; and, on

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the other hand, between the ideals of themselves as teachers and their actual capabilities. While development of student self-directed learning skills by the university is recognized as important, little research has examined the impact of organization of the study process on student self-directed learning.

Promotion of Students' Self-Directed Learning Skills Through Cooperative Learning

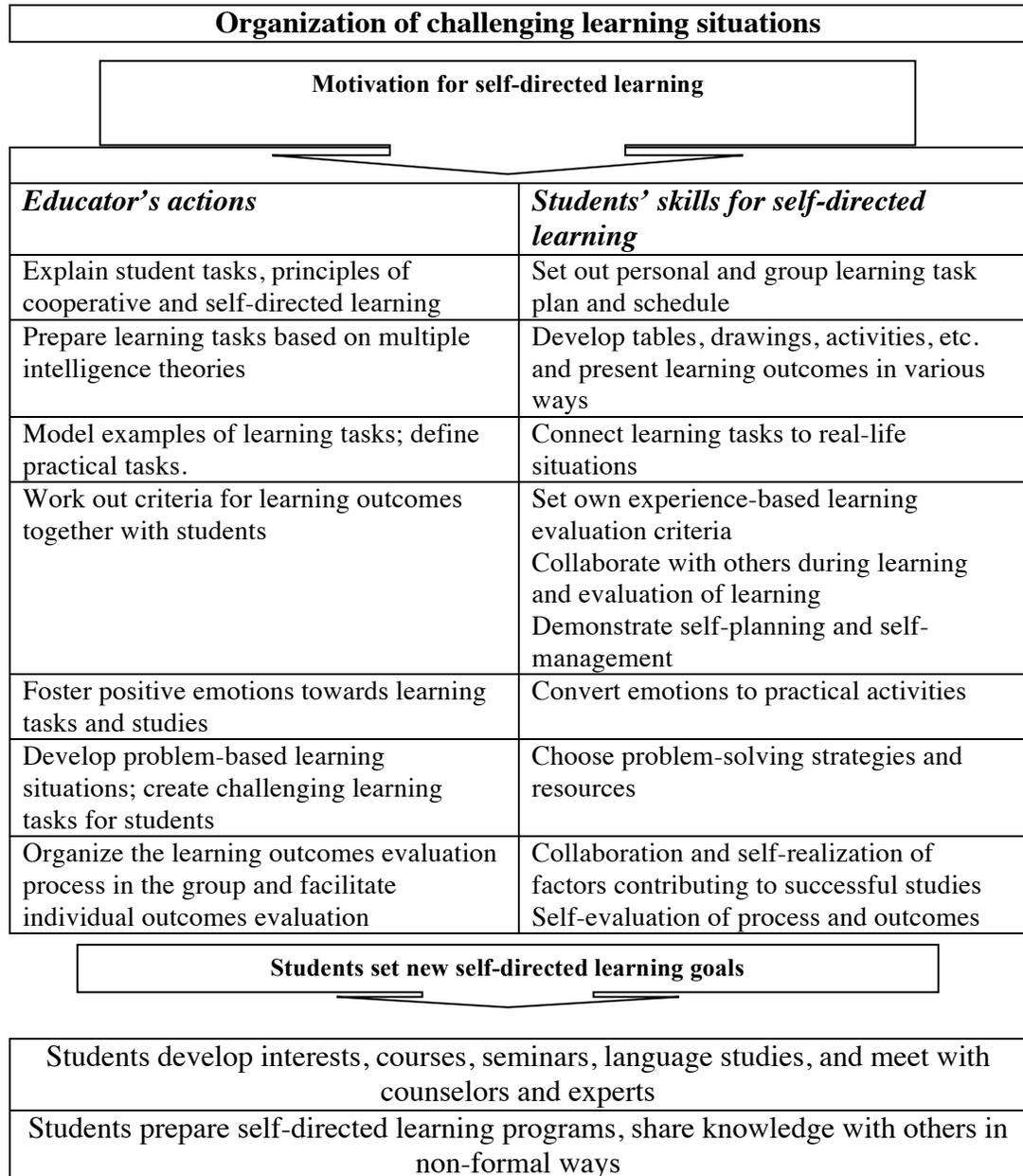


Figure 1. Educational model for promotion of student self-directed learning.

Purpose

This research was designed to explore relationships between use of the cooperative learning process and development of self-directed learning by comparing self-directed learning readiness and self-assessment of students participating in cooperative and traditional studies formats. Two primary research questions guided the study:

1. Is there a significant difference in students' pre- and posttest assessments of readiness for self-directed learning in cooperative learning groups and traditional studies groups?
2. Is there other evidence of positive or negative responses to the cooperative learning implementation?

Procedures

This study used both quantitative and qualitative approaches in a quasi-experimental mixed methods design (Teddlie & Tashakkori, 2006). Self-directed learning readiness and self-assessment data were collected from 14 small groups of university teacher education students who participated in cooperative learning-based educational model pilot projects or in traditional classes (6-15 students per class). The comparison groups were matched by year in studies and study program. Data were examined and compared. Interview data were also collected from students in one cooperative learning-based group at the end of the semester.

Sample and Data Collection

A total of 146 female and 24 male first-, second-, and third-year students between the ages of 19 and 21 participated in the study ($N = 170$). All students were introduced to the purpose of study. Of the 170, 133 students took the SDLRS pre- and posttests, and 170 completed written self-assessment questions. Eleven students who had participated in the cooperative learning pilot program were interviewed at the end of semester using a structured interview format.

Data were collected over a six-year period. Each year, a group of students were assessed for self-directed learning readiness in the beginning of each semester and at the end of the semester after participation in a pilot program using cooperative learning or a class using a traditional teaching approach (primarily lecture). The experimental and control groups were of similar size and composition.

Interview participants included the 11 students who participated in the last cooperative learning pilot class included in this study. All were females, aged 20-21. They were interviewed at the end of semester, after the last test, using a structured interview format.

Instruments

Quantitative data were collected through Guglielmino's (1978) Self-Directed Learning Readiness Scale (SDLRS), referred to during testing as the Learning Preference Assessment (LPA). Further data were collected from written responses to two questions related to skills development and oral interviews with students who had participated in the pilot program (cooperative learning approach).

The Self-Directed Learning Readiness Scale. This assessment was designed to measure the various attitudes, skills, and characteristics that comprise an individual's

current level of readiness to manage his or her own learning. The adult form of the SDLRS has 58 items. Respondents are asked to read a statement and then indicate the degree to which that statement accurately describes their own attitudes, beliefs, actions or skills (Guglielmino, 2009). The reliability and validity of the SDLRS have been well-established (Delahaye & Choy, 2000); it is the most widely used assessment in this field of study (Merriam, Caffarella, & Baumgartner, 2007). It was translated into Latvian following the translation guidelines of the author, Lucy M. Guglielmino.

According to Guglielmino (2010), persons with high SDLRS scores (227-290) usually prefer to determine their learning needs and plan and implement their own learning. This does not mean that they will never choose to be in a structured learning situation. They may well choose traditional courses or workshops as a part of a learning plan. Persons with average SDLRS scores (202-226) are more likely to be successful in more independent situations, but are not fully comfortable with handling the entire process of identifying their learning needs and planning and implementing the learning. Persons with below-average SDLRS scores (58-201) usually prefer very structured learning options such as lecture and traditional classroom settings. SDLRS scores indicate the current level of readiness for self-directed learning. Research studies have provided evidence that SDLR levels can be raised through appropriate educational interventions (Guglielmino & Guglielmino, 1994). The average score for adults completing the SDLRS-A questionnaire is 214 and the standard deviation is 25.59 (Guglielmino & Guglielmino, 2006).

Written self-assessment questions. Students responded in writing to two statements at the beginning and end of the semester:

1. *Skills I'd like to develop are*
2. *My studies would become more successful if....*

Structured interviews. The student interviews included open-ended questions about student learning processes. Face-to-face interviews invited the participant to elaborate on characteristics of self-directed learners and assess their experiences in the cooperative learning intervention.

Data Analysis

SDLRS scores were calculated by Guglielmino and Associates. Other quantitative analysis was done using SPSS 15. The paired-samples *T*-test was used to compare mean pre- and posttest SDLRS scores of the experimental and control groups.

The AQUAD 6 program was used to create a coding system for linkage analysis (Huber, 2008) in order to examine linkages between levels of readiness for self-directed learning, students' views on what was needed for developing one's self-direction, and students' references to collaboration in the study process.

The student interviews were examined for comments related to the students' development as self-directed learners during the collaborative learning process.

Results

Pre- and Posttest SDLRS Differences for the Experimental and Control Groups

SDLRS mean scores in the beginning of semester were higher in the traditional studies group, but at the end of semester, mean scores were higher in the cooperative learning

group. The cooperative learning group mean showed an increase of 5.27 points on the posttest. In the traditional studies group, the SDLRS mean fell an average of 2.86 points from pretest to posttest. Table 1 displays the data.

Table 1. Mean Score Statistics for SDLRS in Cooperative and Traditional Studies Groups at the Beginning and the End of Semester

Group	Statistics	Beginning of semester	End of semester
Traditional studies (n = 63)	M	204.49	201.63
	SD	20.18	21.03
Cooperative (n = 70)	M	200.17	205.44*
	SD	20.38	22.97

*(p = < .05)

The increase in the SDLRS scores for the cooperative learning group from pretest (M = 200.17, SD = 20.38) to posttest (M = 205.44, SD = 22.97) was significant; $t(69) = -2.606, p = .011$. The decrease in the SDLRS scores for the cooperative learning group from pretest (M = 204.49, SD = 20.18) to posttest (M = 201.63, SD = 21.03) was not statistically significant; $t(62) = 1.043, p = .30$. SDLRS mean scores in the cooperative and traditional studies groups at the beginning and end of the semester were lower than the average score for U. S. adults (214).

Figure 2 graphically presents differences between levels of self-directed learning readiness of cooperative and traditional studies groups in the beginning and the end of the semester. The cooperative group had six participants with above average SDLR in the beginning and 13 participants in the end of semester. The traditional studies group had 11 participants with above average SDLR in the beginning and five participants in the end of semester.

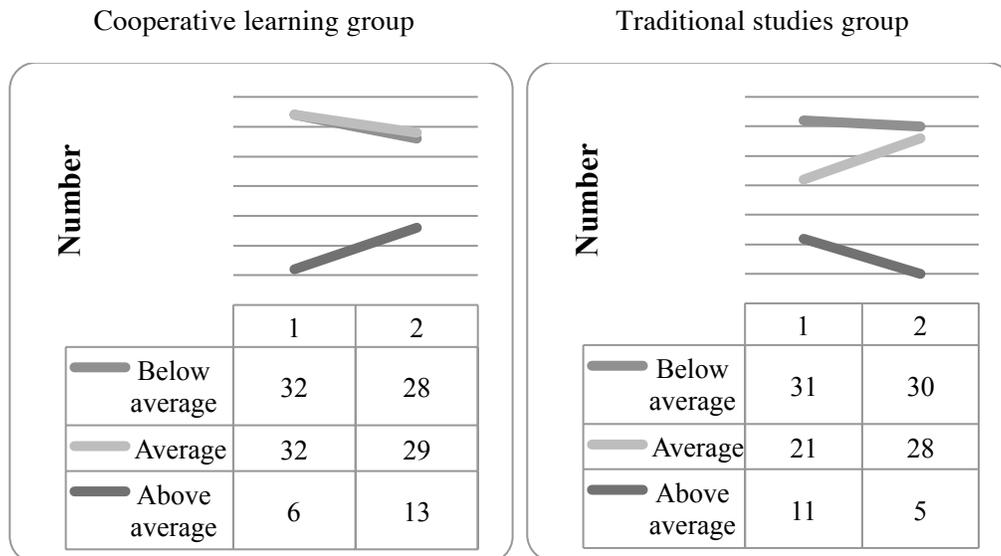


Figure 2. Levels of self-directed learning readiness of cooperative and traditional studies groups in the beginning and the end of semester.

The number of participants with average SDLR decreased in the cooperative group (32 - 29) and increased in the traditional studies group (21 - 28). The number of participants with SDLR below average decreased in both groups (trial from 32 to 28 and control from 31 to 30). Self-directed learning readiness improved after the cooperative learning processes for students of all levels, while in the traditional process, below average and average level students' readiness improved, but above-average students' readiness for self-direction decreased.

Responses to Written Self-Assessment Questions

After completing the SDLRS at the beginning and end of the semester, 170 participants responded to two written self-assessment questions. In the traditional studies group 85 students participated at the beginning of the semester and 76 at the end; in the cooperative group 85 students participated at the beginning and 78 at the end of semester. Students responded to two statements:

1. *Skills I'd like to develop are*
2. *My studies would become more successful if....*

The most frequently named skills sought for SDL development were communication, presentation, organizational, teamwork, listening, empathy, and planning. These skills were mentioned in a professional development context. The most frequently mentioned personal skills were independence, time management, learning new things, self-awareness, ability to express and defend their opinions, self-evaluation, creativity, and official language (Latvian) skills. Analysis of responses to the skills sought indicate that they are grounded in the necessity for key competences and self-directed learning development.

With regard to perceptions of what might make their studies more successful, the most commonly mentioned were more free access to the library (almost 24 hours), easy and free access to the Internet (including university, home, public spaces, etc.), previously prepared lecture materials, clear descriptions of learning outcomes, more feedback from lecturers, more lectures on concrete subjects, and more cooperative and practical tasks. Other factors included better collaboration with fellow students, more free time, better living conditions, improved finances, better time management, increased motivation, better official language (Latvian) skills, better Internet skills, and goal setting. These responses indicate that students perceived external factors as having a strong influence on their success in their studies.

Qualitative analysis using AQUAD 6 was used to create a coding system for linkage analysis (Huber, 2008) in order to explore links between levels of readiness for self-directed learning, students' views on what was needed for developing one's self-direction in learning, and students' reference to collaboration in the study process. Five codes were set for analysis:

- above average level of readiness for self-directed learning,
- average level of readiness for self-directed learning,
- below average level of readiness for self-directed learning,
- students' views on what was needed for developing one's self-direction, and
- students' reference to collaboration in the study process.

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These codes were most relevant to the study purpose and the content of the questions asked. Table 2 presents detailed results of the linkages between codes in cooperative and traditional studies groups' responses at the beginning and end of semester.

Table 2. Crosstab of Frequency of Linkages Between Codes in Cooperative and Traditional Studies Group Written Responses at the Beginning and End of Semester

Linkages between codes	Frequency of linkages at the beginning of semester		Frequency of linkages at the end of semester	
	Traditional group	Cooperative group	Traditional group	Cooperative group
Students' views on the things needed for development of their self-direction – Collaboration in the study process	20	17	10	41
Collaboration in the study process – above average level of readiness for self-directed learning	3	-	2	5
Collaboration in the study process – average level of readiness for self-directed learning	6	9	2	12
Collaboration in the study process – below average level of readiness for self-directed learning	11	8	5	6
Students' views on the things needed for development of their self-direction – Collaboration in the study process – above average level of readiness for self-directed learning	3	-	2	5
Students' views on the things needed for development of their self-direction – Collaboration in the study process – average level of readiness for self-directed learning	6	9	2	11
Students' views on the things needed for development of their self-direction – Collaboration in the study process –below average level of readiness for self-directed learning	10	6	5	6

Analysis of the written responses indicates that perceptions of what is needed for one's development of skills for self-directed learning are related to collaboration in the study process, both within groups of students as well as between students and educators. Comparison of the frequency of correlations reveals that students in the traditional study process mention collaboration twice as frequently at the beginning of the semester as at the end of the semester; the frequency of correlation decreases from 20 to 10. In the cooperative group, the frequency of correlation increases from 17 to 41 from beginning to end. This leads us to believe that the cooperative learning process has positively influenced students' views on collaboration in personal development of skills for SDL.

Analysis of the open-ended responses also parallels results of the analysis of the SDLRS scores. Within the cooperative group, readiness for self-directed learning increases by the end of the semester, but it decreases in the traditional study group. The interviews reveal that in the traditional study process, students refer to closer collaboration with

educators at the end of the semester, indicating a decrease in self-direction; they also indicate that a learning group is not considered a means for self-development.

Analysis of the correlation between collaboration in the study process and the levels of readiness for self-directed learning reveal that in the traditional study process, collaboration as a desirable element was more frequently mentioned by the students with a high or medium level of readiness for self-directed learning at the end of the semester. In comparison, students with low readiness mentioned it half as often.

In cooperative learning, students with high or medium readiness for self-directed learning increasingly stressed the necessity for collaboration, while those with low readiness did not. This finding indicates the positive relationship between collaboration with peers and readiness for self-direction, and it appears that the cooperative learning process may reinforce this tendency. In the cooperative group there are opportunities for developing self-direction for students of all levels.

Structured interviews

Eleven third-year teacher candidates were interviewed in January 2010 at the end of the semester after participation in the cooperative learning process. In face-to-face interviews, the participants were invited to elaborate on characteristics of self-directed learners and the SDL process and to assess their experiences in the cooperative learning intervention in relation to development of their self-direction in learning. This research report focuses on their experiences in the cooperative learning intervention that they perceived as assisting in their development as self-directed learners. Quotes related to that topic are excerpted (translated from Latvian). Of the 11 responses to the interviews, 10 were positive about the cooperative learning process and one was neutral. The initial interview question was, "Evaluate the completed study course." A followup question was, "Did it help in reaching readiness for self-directed learning?" Sample responses are listed in Table 4.

Table 4. *Samples of Responses from Structured Interviews*

-
- [Promoted] readiness. [In] a lot of the self-designed tasks, we [were] seeking information, and that was self-directed learning. Different, a lot of practical work and our own way of thinking.
 - ...This was cooperation in groups. It helps for self-directed learning.
 - A practical course of study. You can learn the best way to learn and master the content.
 - Successful. Positive emotions. Will serve for further studies and I think that also for work. Helps for self-development, not only how to teach others.
 - There were a lot of exercises, which I ... will use and recommend to others. It was interesting. Perhaps that also influenced my self-directedness.
 - Yes, helped. I will know how to do research. Different - a lot of work in groups
 - Does not help me directly. Did not differ.
 - Different, a lot of practical tasks and presentations. [I] learned methods that could be used again. I can better present myself and know how to present my work.
 - Different. Very interesting. Developed skills for teamwork. Got knowledge about cooperative learning. I can help others, to share with others, working in a group, and move towards the target.

The interviews with the participants in the cooperative group at the end of the semester indicate their perception that readiness for self-directed learning can be developed and self-directed learning skills were acquired in the cooperative learning process. The participants appreciated the study process of the cooperative learning model for promoting self-directed learning and their growth of self-direction in it.

Conclusions and Discussion

Through a convergence of results of quantitative and qualitative analysis, this study provides evidence that participation in classes designed in an informal cooperative learning format increased learner readiness for self-directed learning. The students participating in cooperative groups had a significantly higher SDLRS mean score at the end of the semester, while the traditional group had a small (but not significant) decrease in overall mean score. The results of the interviews confirm the results of the analysis of the SDLRS, as the students interviewed almost unanimously indicated a perception that involvement in the cooperative learning process helped them to become more self-directed in their learning. This conclusion is aligned with prior research findings that suggest that appropriate learning interventions can lead to increases in readiness for self-directed learning (for example, Amey, 2008; Daniels, 2011; Dynan, Cate, & Rhee, 2008; Gabrielle, Guglielmino, & Guglielmino, 2003; Kasworm, 1983; Litzinger, et al., 2005; Posner, 1991; and Slaughter, 2009).

There may be differential responses to different learning formats by students at varying levels of readiness for self-directed learning. Students with low, medium, and high levels of readiness for SDL all showed increases in readiness in the cooperative learning group; but in the traditional group only those at the low and medium levels of readiness showed increases. Students in the traditional group with initially high levels of SDL readiness showed declines on the posttest. These differences merit mention because of prior literature that indicates that those with varying levels of readiness for SDL may respond differently to different learning interventions (Dynan, Cate, & Rhee, 2008; Grow, 1991).

The cooperative learning process appears to have positively influenced students' views on the role of collaboration in personal development of skills for SDL. A coding system was developed for analysis of linkages (Huber, 2008) between levels of readiness for self-directed learning, students' views on what was needed for developing one's self-direction in learning, and students' reference to collaboration in the study process. Comparison of the frequency of correlations revealed that students in the traditional study process mentioned collaboration twice as frequently at the beginning of the semester as at the end of the semester; the frequency of correlation decreased from 20 to 10. In the cooperative group, the frequency of correlation increased from 17 in the beginning to 41 at the end of the semester.

As further evidence, in the traditional study process, collaboration as a desirable element was more frequently mentioned by the students with a high or medium level of readiness for self-directed learning at the end of the semester. In comparison, students with low readiness mentioned it half as often. In the cooperative learning group, students with

high or medium readiness for self-directed learning increasingly stressed the necessity for collaboration, while those with low readiness did not. These findings support the positive relationship between collaboration with peers and readiness for self-direction, and it appears that the cooperative learning process may reinforce this tendency.

It is now widely accepted that students leaving our universities will need to be lifelong, self-directed learners (European Commission, 1995, 2001, 2010); and evidence is mounting that effective learning interventions can increase learner readiness for self-directed learning, but further research is needed to identify and refine approaches. It is essential that educators strive to assist in the development of self-directed learning skills, organizing challenging learning situations and supporting students' efforts in self-directed learning. Cooperative learning approaches offer great promise for assisting students to develop skills for self-directed learning in formal educational environments.

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EXPLORING SELF-DIRECTED LEARNING IN AN ONLINE “DO-IT-YOURSELF” FORUM

Dirk Morrison and Jennifer X. Seaton

This paper reports the results of a pilot research project exploring the presence of self-directed learning in an informal “do-it-yourself” (DIY) online forum. The purpose of this investigation is to examine and describe: (a) evidence of self-directed learning principles influencing the use of a DIY informal online forum; (b) patterns of information seeking and exchange within this DIY forum; and (c) the utility of a particular data pattern mapping tool to analyze online SDL forum contexts. This exploratory research is part of a larger program of research attempting to discover and articulate fundamental characteristics of informal online settings, those providing evidence of self-directed learning as being of particular interest.

Keywords: informal learning, self-directed learning, online learning, “do-it-yourself” (DIY) forums, knowledge ecologies, communication interaction analysis

The use of online, internet-based tools and resources to support informal learning has caught the attention of researchers and reignited the imagination of media pundits. In addition, understanding the processes of informal learning and harnessing its potential is of growing interest, as the report card of formal educational institutions continues to be dismal (Heller, 2012; Ladner & Myslinski, 2013). Research efforts to understand and design effective online learning environments in higher education contexts have been significant (Hill, Wiley, Nelson, & Han, 2003; Shroff & Vogel 2009; Stefani 2011); and informal and incidental learning are identified as critically important areas for further research and theory-building by Marsick and Watkins (2002) and McLean and Vermeylen (2013). Professional development and training contexts have also enthusiastically embraced online informal self-directed learning, via social networking tools, as a means and method to enhance these activities (Boud & Middleton, 2003; Dennen & Meyers, 2012). However, while many studies have focused on affordances such as flexible learning, time-place independence, and other attributes of online learning, only a few have addressed self-directed learning as a critical affordance of informal learning (Hartley & Bendixen, 2001). The conjoining of self-directed learning strategies within the context of an informal learning community, using online communication tools and

affordances, is an exciting and relatively unexplored territory, one that this pilot, exploratory research will begin to examine.

Scholars working in the area of self-directed learning (Brookfield, 1984, 1993; Knowles, Holton, & Swanson, 2011; Tough, 1967) have clearly underscored the fact that adult learners access, use, and re-craft resources, via multiple sources and methods, to facilitate their learning goals without the involvement of formal educational institutions. Informal, often incidental learning (Marsick & Watkins, 2002) is the norm, not the exception for many adult learners. Concepts such as public pedagogy (Sandlin, O'Malley & Burdick, 2011; Wright & Sandlin, 2009a), transformational learning (Mezirow, 2012), and self-directed learning (Candy, 1991; Hiemstra, 1994) all provide useful conceptual and descriptive frameworks for understanding the learning and change experienced by adult learners learning outside the confines of formal education systems. Of particular interest here is Candy's (1991) list of four principal domains of self-direction, namely: personal autonomy, managing one's overall learning endeavors, independent pursuit of learning, and learner-control. However, this paper will also consider three additional components of the concept of self-directed learning, as described by Guglielmino, (1978), in Merriam, Caffarella and Baumgartner (2007), namely: "initiative and persistence in learning, high degree of curiosity, and viewing problems as challenges" (p. 121) to interpret and understand the self-directed nature of a particular online, informal DIY learning context; the goal is to examine and illustrate the potential for these online learning environments to facilitate the processes of acquiring and building knowledge by autonomous adults engaged in self-directed learning.

While the DIY movement seems a recent phenomenon (Hemphill & Leskowitz, 2012; Tanenbaum, Williams, Desjardin, & Tanenbaum, 2013), modern-era DIY communities can be dated to the early 1920's, embodied in the self-directed and informal learning activities of amateur radio hobbyists (Kuznetsov & Paulos, 2010); these authors, point out, however, that "over the past few decades, the integration of social computing, online sharing tools, and other HCI [human computer interface] collaboration technologies has facilitated a renewed interest and wider adoption of DIY culture and practices..." (p. 1). It is important to note that we have here expanded the DIY definition beyond the creation of artifacts (objects and/or software) to include "...the processes of knowledge making...as an ecology of agents, artifacts, rules, resources, activities, practices and interactions" (Lanzara & Morner, 2003, p. 1). This conceptual widening, beyond the production of artifacts, is in accordance with the definition proposed by Torrey, McDonald, Schilit and Bly (2007). Our focus, then, is on the knowledge-making aspect of DIY culture; specifically, the context of online learning forums with a *how-to* orientation, centering on sharing resources, activities, practices and interactions.

Our Focus

This exploratory study had three distinct research objectives. We sought to:

- discover and describe, by analyzing posted resource content, if there are self-directed learning principles evident in this DIY online forum;

- describe patterns of information seeking and communication exchange within this DIY online forum; and
- evaluate the utility of *Inspiration 9™* software as communication pattern mapping tool and whether the utilized methodology is generally productive in investigating informal, self-directed learning online forum contexts.

Virtual Knowledge Ecologies or Virtual Learning Communities?

Our original research path determined to investigate particular informal, self-directed DIY-oriented online forums against the theoretical backdrop of virtual learning communities as described by Schwier (2007). Upon review and analysis of a selected sample of DIY forums, it was speculated that, perhaps, we were investigating not a virtual learning *community* per se, but rather something quite different. An alternative working metaphor was chosen using Lanzara and Morner's (2003) term: *knowledge ecologies*; the conviction was that this conceptual lens would prove to be a more productive and a better fit for the type of online learning forums we investigated. Further, as mentioned earlier, the traditional concept of Do-It-Yourself (DIY) was overly concerned with the production of artifacts as a defining element; however, as a starting point appropriate to an exploratory pilot study, we decided that examination of a subset, online learning forums with a *How-To* orientation, could prove fruitful. In accordance with the definition proposed by Torrey et al., (2007), we reviewed and analyzed an online learning forum that filled the criteria of "knowledge sharing as a fully decentralized expertise-location system in which How-To functions as both a broadcast of the authors' expertise and personal portfolio" (p. 1).

Site of Analysis

After the initial exploration of wide variety of at least 20 informal DIY-oriented online forums (e.g., health, music, art, etc.), primary characteristics emerged and guided our final selection criteria: participants' willingness to freely and openly share information, the timely and friendly exchange of advice, demonstrated range of experience levels, and exchange of valuable knowledge resources. Of course, these characteristics are integrated and interrelated, but the very last characteristic, sharing of helpful and targeted knowledge resources is of special interest here. In our view, the sharing of important and helpful knowledge resources (at least to the forum members), constitutes tangible contribution to the building of what we would define as a healthy, vibrant knowledge ecology. Some of the postings represent a considerable amount of effort and forethought in terms of construction, collation, and crafting. It is speculated that these processes may be key prerequisite beginnings of the development of a true virtual learning community.

Criteria for Selection

The criteria for selection of specific DIY forums as the context for analysis included five criteria. The DIY forums must demonstrate:

- an overall “how-to” orientation, with clear answers to specific questions posed;
- a long enough history to provide a longitudinal perspective, (a topic/thread that is at least a couple of months old);
- a focus; namely, it is about a topic of mutual interest;
- variety in terms of multiple contributors or variable levels of expertise and knowledge;
- termination at some discrete point (this could be that the problem or topic has been exhausted and dies a natural death, and/or, it could shift to a related but not specific to the original question, problem, or discussion).

Two colleagues from the researchers’ university, both avid and experienced consumers of informal online learning forums, were recruited to provide their top five informal online DIY forums to the researchers, evaluated according to the above criteria. After some deliberation, the site of analysis chosen by the researchers for this pilot study was an online forum dedicated to an established and growing category of popular motorcycling, *sport-touring.net*. Considered by many as the preferred site for an impressive breadth and depth of information and expert advice, it was established in 2008 and has 20,000 members and 1.84 million posts across multiple forums. *Sport-touring.net* had the right set of extensive forums from which to choose a single site of analysis, one that fulfilled the five selection criteria outlined above. The online DIY forum selected was entitled “Planning My First Long Trip,” initiated by a former U. S. Marine querying the forum for advice regarding planning considerations for his first long-distance tour (four to five-day trip, traveling from the Eastern U. S. to the Southwest).

Methodology

It was clear that a qualitative methodology, one that employed content analysis as the primary tool, was the best fit to analyze and understand the knowledge making-processes evident in our site of investigation. Given our need to experiment with the methodology, it was decided that our first task should be to map the territory, carefully documenting, via a concept mapping software tool, such as *Inspiration 9™*, the variety of interactions, their patterns and consequences, not the least of which was extending collective knowledge. It is important to note that a conscious selection of a restricted amount of information to analyze, to begin to understand the unique features of the knowledge ecology presented to us, was employed; this is usual practice in qualitative content analysis, particularly when testing a methodology or approach in a new context. It helps obviate the error of attempting to examine the whole before understanding the parts, which could prove overwhelming

and likely not generate any meaningful or coherent results.

One can observe that the interaction patterns are both extensive and complicated (see Figure 1 below). Our procedure was to first capture the online forum discussion, including all threads and sub-threads, within a Word document. Coding messages by authors' online *handles* (i.e., forum names created by users when they sign up as members of the forum) retained anonymity but provided the foundation of the communication pattern analysis. Next, coding was applied according to types of messages, which included preconceived categories (e.g., resource-sharing), as well as emergent categories (e.g., support/encouragement). Following guidelines proposed by Rourke, Anderson, Garrison and Archer (2001), our preferred unit of analysis was the message, understanding that any single message might contain more than one theme or category that could potentially be coded. The choice of unit of analysis, as Rourke, et al., (2001) point out "involves considerable compromise" between meaningfulness, productivity, efficiency and reliability (p. 64).

Categories that were coded for in our content analysis include:

- How to
- Advice
- Problem-solving
- Extending knowledge/information
- Resource sharing: information
- Resource sharing: personal experience
- Disagreement/debate
- Support/encouragement

As mentioned earlier, the entire forum was captured and replicated (stripping out html formatting, etc.) to create a transcript in Word; while using Word was sufficient to initially organize and code the initial transcript, it was clear that we needed a better tool to map the communication and reciprocity patterns evident in this active informal DIY online forum. In short, we needed to see the patterns, to create a visual representation of the transcript that could readily show the interrelationships and activities between participants. While qualitative analysis software tools (e.g., *NVivo*TM, *Atlas*TM, etc.) are powerful aids and readily available, it was thought that a basic concept mapping tool would suffice and would present the patterns of communication and relationships of each in a graphic format that could prove useful. The concept mapping tool chosen, *Inspiration 9*TM also allowed the capture of discrete messages, using the notes tool, resulting in not only a graphical representation of the forum but also the referent text/s for each node; this affordance is important when considering inter-coder reliability checks (i.e., one can quickly check the text/message against the visual code applied). For the purposes of this pilot study, only single categories were applied to each message. For example, under the *Resource Sharing: Information* node, posts were coded for references to where a member had gathered concrete information about the topic of conversation and then shared this with the discussants, specifically referencing books, links to other

websites, etc.

The visual coding scheme, utilizing images from the icon library resources available in *Inspiration 9™*, including shapes, colors, and icons, is as follows*:

- *Light blue color*: posts from the original posters named.
- *Light blue circle*: posts that update readers on the poster learning process.
- *Grey circle*: *advice* with no external/explicit source.
- *Light pink circle*: *information* from personal experience.
- *Dark pink circle*: directing to use learner's own experience to learn more.
- *Any square*: a "child" post (author named in another post).
- *Computer image*: Internet resources.
- *Question mark*: explicit request for information.

*Note: Readers of the print copy may not be able to distinguish colors. Go to <http://sdlglobal.com/journals.php> to view.

In order to make sense of the flow of information between forum participants, it was important to clearly identify connections made and content shared that, for example, built on previous information. Via lines drawn connecting relevant postings, a mapping of the knowledge building process was facilitated. Moving beyond simple connection, the *linking lines* themselves were assigned three distinct meanings, as follows:

- *Add line*: building on the previous information, building knowledge.
- *Endorsement line*: not adding additional information, but affirming.
- *Support line*: supporting evidence proposed.

When all content coding and communication connections were complete, we had constructed a visual map of community members, the information they provided, and how other community members interacted with the information provided. Because we were interested in how knowledge was built, we wanted to distinguish when community members were communicating to engage in social activity and when they were communicating to enrich or supply information. Therefore, our mapping system had to capture this subtlety. This was accomplished by representing both the users and the information (if any) they contributed. The lines were then used to show the interactions to address the following nuances:

- Were people replying to socially engage a person, or to react to the content of information?
- Was an endorsement/disagreement personal, or did the individual supply information that either supported or refuted a claim?

adding two additional resources, one from personal experience and one an Internet resource.

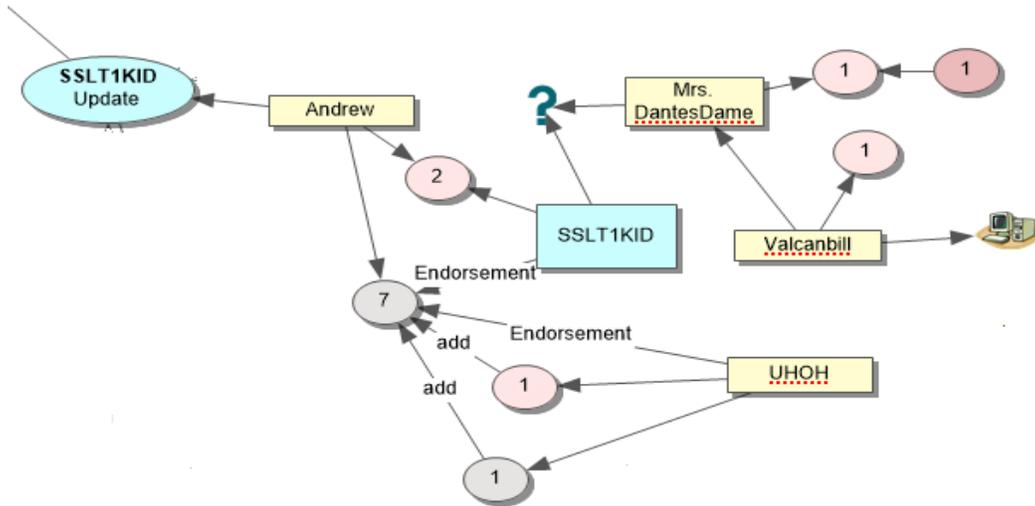


Figure 2. Illustration of incremental growth of information exchange and knowledge building among forum members.

This example demonstrates the value that members place on enriching not only the amount of information shared, but also the quality of it. *SSLT1KID* requests information about how much clothes to pack, which *Mrs.DantesDame* answers by telling him how much she packs and suggests personal experience can be used to modify the list. *Valcanbill* then adds to that information by making additional suggestions about what type of clothing is appropriate and even supplies an external Internet link to a particular cold weather riding shirt he advises that *SSLT1KID* buy. In other words, merely answering his question is not enough: the community strives to provide more details on the information requested and add helpful details. This pattern is again seen when *UHOH* replies to Andrew by not only endorsing Andrew’s advice, but also expanding on the content. Importantly, this additional fine grain information is added to improve, not only the quantity, but also the quality of the information.

This process of adding informational value, via the willing sharing, exchange and evolution of expert advice observed here, clearly lines up with Knowles’ (1975) characteristics of individuals exercising self-directed learning by “taking the initiative, with... the help of others...[and] identifying human and material resources” (p. 18) to meet their learning goals. Seeking and sharing informed opinion, concrete information and helpful, trustworthy advice is a vital foundation of sustainable and vibrant online learning communities (Avery, Resnick, & Zeckhauser, 1999); this willing exchange points to mutually beneficial, egalitarian reciprocity, perhaps rooted in altruism, as the prime motivator for such intellectual and temporal investment by participants (Bolton, Katok, & Okckenfels, 2004; Giesler, 2006; Schau & Gilly, 2003; Wasko & Faraj, 2000).

A Nuanced Value of Contributions

As a subset of resources contributed, as a solution set to *problems* and *challenges* articulated as a learning goal (as described by Guglielmino, 1978), individuals were willing to share personal experiences as a source and method to supplement the quantity and quality of information posted, thereby enhancing the knowledge-building enterprise clearly underway. This process of sharing personal experience added a decidedly human element to the context of curiosity-driven, problem-solving, and question-answer nature of the forum. As is true of most DIY forums, lived experience is a cornerstone of expertise, a highly regarded commodity in such environments. Interestingly, expertise in these informal, self-directed learning environments is not necessarily based on formal credentials, but rather on the relative value of the information and knowledge shared. It is speculated that this personally-grounded, tacit respect for advice provided by those drawing from a wellspring of knowledge based on hard-won experience perhaps provides a different kind of status that might be a core motivating element driving the reciprocal dynamics of knowledge ecologies of this sort. This is not surprising as one might see knowledge status rise in online forums focused on, for example, fine art or music, where skills, knowledge, competencies, and such are judged according to what one can actually do (and what others can, in turn, do with the information/knowledge shared) and not according to where one attended college, or what one's formal credentials are. In the end, endorsements based on experience might mean more, and therefore be valued more highly, in knowledge ecologies of this sort. Members of the community seem to endorse this theory. One interesting progression in the discussion thread was that near the end the thread was hijacked by another user. *Hijacking a thread* is a process whereby another user becomes the leader of the thread, thus supplanting the previous user as the knowledge seeker. This thread had 128 replies; and, after the 53rd reply, a second person, *Mr.Black*, hijacked the thread and became a central figure in the discussion. After that point, the thread revolved around helping both SSLT1KID and *Mr.Black* prepare for their first long trip. The importance of this switch is not that it happened, but how it happened. *Mr.Black* had commented on the thread before that time and was actively following the thread as demonstrated in his comment:

I am planning my first long trip as well. This has been helpful. As Bomber already said, Thank you all for some good info.

Mr.Black was a senior member that had been with the forum for over ten years and had made over 10,000 posts to the general forum. Yet, posting that he had not completed a long trip seemed to open him up to ridicule.

Cricket1: Mr. Black- let me see if I've got it straight. You've been on STN since 2009, have a Suzuki Bandit, over 10,000 posts, and have not been on a long bike trip? Or maybe you're just foolin' with us?

Vulcanbill: I'm pretty sure there is an inversely proportional relationship between post count and riding experience with a few exceptions.

Mrs.DantesDame: "Hundreds of miles" is a weekend jaunt!

Mr.Black's initial replies to this attack appeared defensive and unfriendly (e.g. he referred to the community with an epithet). However, he did manage to make it clear that he did have a lot of riding experience at shorter distances, at which point the replies became more supportive and his responses less defensive. *Mr.Black*'s comment "Now about my post count versus mileage, well, Carry on," adds credence to the point that this community appears to value information about personal experience over other forms of information or perceived status along other dimensions (e.g., prolificacy as a forum poster).

In our analysis of the transcript and consequent mapping, there were multiple examples where personal experience was being presented to validate information and/or to add more detail to the information posted, extending the depth of the information considerably. For example, in our coding scheme, we identified (with a grey circle), advice with no associated explicitly external source referenced (e.g., "Make sure you tie up your bags high!"). A light pink circle indicated more concrete information coming from personal experience (e.g., When I took this route instead of that one, pitfalls, etc.). Finally, dark pink circles were used to identify an encouragement or directing to use learner's own experience to learn more (e.g., "Use your *own* experience to learn how to handle a bike prepared for a tour; load up your bike, then take it for a few short rides!"); here the information seeker will use his own experience as a resource to extend his knowledge.

The above observations may provide a distinct contrast to the relatively artificial learning environments provided by the academy, where knowledge based on personal experience is often, at best, privately suspect at best or, at worst, outwardly maligned; such knowledge is regularly characterized as biased and subjective, and therefore untrustworthy and of little value. However, in informal, self-directed online learning environments, there may be precisely an opposite metric of value in operation: knowledge gleaned over years of practical application of information to solve real-world challenges and problems, the entire process embedded in one's personal, lived experience, is awarded a precisely different kind of value and respect. In the case of our pilot study, the experienced rider who has personally undertaken a significant number of long-distance motorcycle tours has likely learned critically important things along the way, perhaps via trial and error, that may not ever make it into a text or guide. Advice based on experience is eagerly sought after and paid serious attention in a myriad of informal, self-directed learning domains; and this forum proved no different. We would argue that this is analogous to tacit knowledge expressed, a revealing and/or re-packing of expertise for others to use in their action choices and associated skills acquisition (Dreyfus & Dreyfus, 1986), and as such, is a powerful source of information and knowledge for self-directed learners exploring informal learning environments.

personal experience. This is illustrated in Figure 3 when *Justin* replies to *still kickin's* post by adding the personal experience that he found he does not need a tent on such trips. *Mrs.DantesDame* replies to *Justine* and reminds him that the trip plans being discussed are for the winter months (Southern U. S.), so that information disagrees with the advice to not take a tent. *Justin* replies to *Mrs.DantesDame* by explaining that he has slept without a tent during the winter months, in similar geography, and supports that claim by providing an external Internet link to a thermal sleeping bag designed for such conditions. It is important to note that members do not tell each other that they are wrong; rather, they counter each other's arguments by supplying additional information. Thus, an apparent conflict of opinion and advice can be productive in generating additional information without disrupting group harmony.

The Human Element

Within any communication matrix generated by an online forum such as this, it is important to note the clearly supportive elements reflected in the discourse; these humanize the environment and provide an atmosphere of ease and willingness to share, question, and generally encourage one another to be curious about the topic. These important elements were evident in the interchange on the site:

- *Endorsement*: not adding additional information, but affirming and encouraging (e.g., “Just saying “ya, that’s right.”).
- *Support*: supporting evidence proposed (i.e., give advice, then add to it by posting additional, separate source that would confirm the validity of shared experience).

Conclusions

It is clear that, using a concept mapping tool (*Inspiration 9™*), we were able to address our second proposed question and begin to delineate concrete patterns of information-seeking and exchange within the DIY forum and speculate that these patterns contribute to the development of a virtual learning community, as described by Schwier (2007). In addition, using a content analysis methodology applied to the communication exchanges, we were able to observe clear self-directed learning orientations influencing the use of this informal learning DIY forum; it is our opinion these participant orientations are necessary to form the genesis of informal virtual learning communities (VLCs).

Given the very nature of informal online learning forums, it goes without saying that learners within these environments would expect a demonstration of personal autonomy, learner control, and would be responsible for managing their own learning endeavors, indicative of self-direction in learning (Candy, 1991). Within this DIY online forum, it was clear that participants (learners) also took initiative and persisted (Guglielmino, 1978) in their personal and collective trajectories of inquiry, exercising both an independent and *interdependent* pursuit of learning (this latter nuance adds an important richness to Candy's (1991) original

four principal domains of self-direction in learning). Finally, Guglielmino's (1978) elements of self-directedness were evident in the DIY forum: the problems posed (as questions) to the forum were viewed as collective challenges for solutions (answers) and initial curiosity was satiated by helpful and concrete advice provided by the community members.

These analyses provided additional conclusions regarding the nature of this DIY online forum. First, an important finding was the nuanced honoring of personal experience as a useful source of valid and reliable information. Second, healthy discussion and debate, focused on information provided, not on personal credentials, was an important observation. These processes both expanded and enriched the quality of the information, via collegial exchange of ideas and opinions, based on what they participants had learned from experience, supplemented with external, independent knowledge sources (e.g., Internet resources). Finally, through these exchanges, exploration and building of knowledge took place within a positive and helpful social learning environment, one where support and endorsement of others was clearly evident.

This exploratory research study had three distinct research objectives: (a) to discover and describe, by analyzing posted resource content, if there are self-directed learning principles evident in this DIY online forum; (b) to describe patterns of information-seeking and communication exchange within this DIY online forum, and (c) to evaluate the utility of *Inspiration 9™* software as communication pattern mapping tool and determine whether the utilized methodology is generally productive in investigating informal, self-directed learning online forum contexts. Given our experience and analysis, we conclude that this type of informal, self-directed online forum can facilitate not only an information access and exchange system but represents a type of knowledge ecology. Also, the utility of a concept mapping tool, as an initial method to organize and make sense of an otherwise unwieldy communication matrix such as this online DIY forum, holds research promise for investigating, analyzing, and interpreting similar online knowledge-building ecologies.

Need For Further Research

We had initially hoped to repeat earlier work regarding testing the *Mean Reply Depth* (MRD) tool (outlined by Wiley, undated, in Schwier & Seaton, 2013) but decided this approach was inappropriate given the nature of the apparent informal interaction patterns (i.e., only two or three levels deep, at most, the variable foci of the discussion threads, etc.). While it is a promising tool for message analyses within contexts of formal online learning communities, where there is an explicit expectation for members to reply to each others' topic-focused postings and comments, it is possible that MRD may prove a useful construct for additional analyses within other informal online forums and/or informal virtual learning communities.

In their work examining self-directed, informal learning within the context of readers' use of self-help books, McLean and Vermeulen (2013) identified three potential learning pathways: linear, incomplete and incidental. A *linear* learning

pathway is described as one or more clearly defined learning goals resulting in concrete action taken as a result of the learning. An *incomplete* learning pathway is characterized by one or more learning goals, identified opportunities to apply what was learned, but failure to take specific action as a result of the learning. Finally, an *incidental* learning pathway describes outcomes for learners who “either had no concrete learning goals, or whose learning goals and eventual actions were not clearly linked with the learning outcomes from the self-help book they had read” (p. 9). This latter “learning pathway” is of special import to any future investigations of informal, self-directed online learning environments, as it is speculated that at least some significant proportion of the learning that takes place must be incidental or “learning accomplished without pre-existing goals, or to changes made that did not relate directly to lessons learned...” (p. 13). At the very least, informal online learning forums provide multiple opportunities, via social networking tools, to exchange with others and to discuss; and it is suspected that this affordance would have an effect on learning pathway outcomes.

Finally, examining and understanding the reciprocal role of knowledge seekers/knowledge contributors within informal online learning environments is an important research trajectory. Possible areas include examining the effects of these roles on motivation to knowledge contribution, interaction propensity, commitment to the community, perceived informational and instrumental value, efficacy and expectancy, ease of communication, and general involvement and active contributions in the online environment (Lampel & Bhalla, 2007; Wang & Fesenmaier, 2004; Wiertz & de Ruyter, 2007).

It is clear this pilot research has just offered a glimpse of what is a promising, complex, and infinitely varied self-directed learning context--one of a very different kind. Further explorations are needed of this new and boundless territory that defines informal self-directed online learning environments. Varying in emphasis as they do in content, one being unique from the other, they create an exciting research challenge, one that is necessary to undertake if we are to discover and re-craft a radically expanded and deeper understanding of lifelong, self-directed learning in the 21st Century.

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EXPLORING THE ATTRIBUTES OF SOCIAL CAPITAL AND SELF-DIRECTED LEARNING FOR ADULTS WITH LOW SKILLS

Maurice Taylor, David Trumpower, Sait Atas, and Edward Purse

The aim of this study was to determine if an association exists between the adult learner asset of social capital and readiness for self-directed learning. A survey design was used with workers and adult learners from different locations in three Canadian provinces - Manitoba, Ontario, and Nova Scotia. The quantitative data were collected through the administration of the recently developed Social Capital Inventory (SCI), and the Self-Directed Learning Readiness Scale (SDLRS) questionnaire for 115 participants. Results indicated evidence for only a weak, non-significant association between adult learner assets of social capital and their readiness for SDL in this study. Therefore, it appears that the SCI and SDLRS measure somewhat independent constructs.

Keywords: self-directed learning, social capital, SDLRS, SCI, workplace learning, Canada

Employers, individuals and governments invest significant amounts of money in formal adult education and training activities, often in response to Canadian labour market shortages. As a result, the ways in which adult workers engage in learning to improve their work performance or acquire essential skills remains an important research topic in adult education (Canadian Literacy and Learning Network, 2012). Related to this is the fact that employees with higher educational attainment are participating in adult learning and training activities to a greater degree than workers or adult learners with low skills (Canadian Council on Learning, 2011). These participation rates in learning pose a significant challenge given that millions of Canadian adults do not have the literacy and essential skills needed to keep pace with the escalating demands of our knowledge economy and society. Canada's performance in literacy and numeracy in the recent Programme for International Assessment of Adult Competencies (PIAAC) gives cause for concern. Not only has the average score for adults fallen from its 2003 level, but the share of the population who scored below the desired level (Level 3) has increased to 49% from 41% in 2003 (TD Economics, 2013, p. 3).

Recently, however, there has been a call to better understand how informal learning can contribute to the future of lifelong learning and work (Werquin, 2010; Eraut, 2011; Sawchuck, 2011). Even though informal learning activities such as self-

directed learning (SDL) pervade all spheres of life, Taylor and Evans (2010) suggest that there is a large gap in our understanding as to how adult learners seeking entry into the labour market view this type of informal learning. Not unlike other western economies, the Canadian economy is under increasing competitive, resource and technological pressures, which are in turn felt by those within the workforce. As Guglielmino and Guglielmino (2006) identified, there has been increasing emphasis on learning and acceptance of responsibility by each individual for recognizing and addressing his or her own learning needs and then sharing that learning with appropriate others in the organization. In other words, each individual now needs to function as a self-directed learner in order to meet the demands of the rapidly changing workplace (p. 21). Furthermore, Miner (2012) maintains that adult learners who are preparing for entry or re-entry into the labour market not only meet employment challenges, but they have not fully gripped the potential of learning outside of the formal college classroom.

Given the potential benefits to individual learners and their work performance, readiness and capacity to engage in SDL are seen to be of increasing relevance. One potential attribute related to individuals' capacity to engage in and readiness for SDL is their "stock of social capital" (Taylor, Trumppower, & Pavic, 2013, p. 103). Appreciating that individuals interact with the socio-cultural context in which they live and work, one could readily suggest that assets of social capital might contribute to the readiness to participate in SDL and support the capacity to engage in SDL. Following this line of argumentation, the study was guided by the main research question: Is there an association between adult learners' assets of social capital and their readiness for SDL?

Literature Review

Two bodies of literature converge to support the thrust of the investigation: self-directed learning and social capital. While there has been no single, accepted definition of SDL, it is commonly understood to be a form of intentional learning where adults themselves take on the primary responsibility for planning, carrying out, and evaluating their learning experiences (Merriam, Caffarella, & Baumgartner, 2007, p. 110). In fact, it is often characterized by a significant level of individual choice and control, with the learner situated as an autonomous decision-maker in the learning activities.

A plethora of literature does question, however, whether the adult learner is actually isolated from the socio-cultural and environmental context in which the learning occurs (Brockett & Hiemstra, 1991; Jarvis, 2008; Knowles, 1975; Tough, 1967). As Merriam, Caffarella and Baumgartner (2007) assert, "Autonomy is not context free; there is a relationship between the personal and situational variables that must come into play for a person to be autonomous in certain learning situations" (p. 123). Interests and one's degree of freedom and autonomy can be affected by a wide range of influences in an individual's life.

In an important job-related SDL study, Clardy (2000) identified three types of learning projects: induced, voluntary and synergistic. Induced projects are undertaken because of some perceived imbalance between current and needed skills; voluntary projects are those undertaken because of a personal desire to learn; while synergistic

projects “arise in situations where there are new enabling organizational conditions that ignite a latent employee readiness to act and learn.” (p. 121). Clearly in both induced and synergistic SDL projects, the socio-culture context is implicated. It can often be assumed that there are potential socio-cultural drivers in the voluntary SDL as well. As the author points out, the socio-cultural context is interwoven into the goals, processes and activities of the learner.

We also find this socio-cultural dynamic in the earlier work by Hammond and Collins (1991) and their model for adult learners pursuing SDL. Many of the elements of their seven-step model clearly identify the importance of not only the personal and social context, but also the economic and political contexts. This argument is also supported by Brookfield (1985) in a study of learners with low educational attainment.

[The] networks and information exchanges provided evaluative indices for learning through peer comparison, and they established a setting within which the learners could act as skill models and resource consultants to fellow learners of varying levels of expertise. . . [They] used peers, experts, and fellow learners as their chief sources of information and as their skill models... the acquisition of skills necessary to the development of expertise were accomplished within a context of informal, oral educational transactions. Information was shared through spontaneous conversation, and those members of the network who were regarded as possessing outstanding talent in a particular area came to serve as skill models for enthusiasts possessing varying degrees of expertise. (p. 8)

What is important here is that adult learners placed their learning efforts very deliberately in the social context. However, in a later work, Brookfield (1993) argues that the conditions under which SDL occurs are as much political as they are pedagogical, as the alternatives that are often considered by learners are rooted in the environment in which they structure learning.

Merriam and Bierema (2014) suggest that learners exercise autonomy in that they are responsible for both what learning will occur and how it will occur, but these learning opportunities are “mediated by opportunities they find in their own environments” (p. 66). Furthermore, Kasworm (2011) notes it may be that the environment of people, supports, and experiences all can provide a significant “holding environment” to aid the learner’s journey towards a more evolved state of cognitive complexity or of consciousness (p. 26).

These assertions about SDL and the interconnectedness of learners within the social context seem to lead into a discussion of social capital. Hartley and Horne (2006) claim that the difficulty in defining social capital has been a recurring theme in the literature, which is largely due to the methodological approaches with which the concept is studied. Nevertheless, a definition of social capital as networks, adopted by the Organization for Economic Co-operation and Development (OECD), is now widely accepted:

The networks together with shared norms, values and understandings facilitate co-operation within or among groups. Networks relate to the objective

behaviour of actors who enter into associative activity. Shared norms, values and understandings relate to the subjective dispositions and attitudes of individuals and groups as well as sanctions and rules governing behaviour, which are widely shared. (Healy & Cote, 2001, p.41)

Important to the context of this study is the work of Coleman (1988), who suggests that social capital inheres in the structure of relations between actors and among actors (p. 98). Similarly, Merriam, Caffarella and Baumgartner (2007) state that social capital theory focuses on social networks, mutual trust communities of practice, and relational forms of capital (p. 89). However, measuring the concept of social capital has generated much dialogue about the robustness of the construct. Accepting that there is no single construct of social capital, Putnam (2000), suggests that the emphasis should be on the multiple dimensions of social capital. This emphasis focuses on the existence of networks of social connection that produce norms of reciprocity and trustworthiness among individuals. By developing this concept, he illustrates how people's motivations and choices are not simply triggered by their individual circumstances, but also by their social insertion and involvement in community life. In this light, social capital can be recognized as an enabler to adult learning and the benefits to self-directed learning become evident.

The topic of social capital should be approached cautiously, however. The term *social* implicates various socio-cultural-economic dimensions and the potentially inherent positive and negative aspects. The social capital that inheres in networks can generally be seen in a positive light; but within the transactions, there may also be aspects of social control/conformity, restricted access to opportunities or freedoms, increasing sense of enforceable obligation or indebtedness for donors and recipients, and downward levelling norms (Portes, 2000). These negative consequences need to also be considered as part of the contextual or environmental conditions in which social capital transactions occur. As Portes (2000) describes the contemporary uses of the term social capital, he cautions, "The concept [of social capital] focuses attention on the positive consequences of sociability while putting aside its less attractive features." He also notes that those positive consequences call attention to how nonmonetary forms can be important sources of power and influence (p. 2). This concept is further supported by Healy and Cote (2001), who state that "access to information and influence through social networks also confers private benefits on individuals and in some cases can be used by individuals or groups to exclude others and reinforce dominance or privilege" (p. 42).

In their study using a newly developed Social Capital Inventory, Taylor, Trumppower and Pavic (2012) found that social norms may motivate individual participation in training and that learners with stronger stock in social capital may be better able to navigate the uncertainties related to their employment situation and individual learning. In their exploratory study, the authors discussed the potential of social capital both as an outcome and a resource to learning. In understanding the socio-cultural and environmental influences on those engaged in SDL, the assets related to social capital may be seen as contributing to the SDL process. The aim of this study was to determine if an association exists between the adult learner asset of social capital

and readiness for self-directed learning. It may also contribute to a better understanding of the construct of social capital and provide further validity evidence for the Social Capital Inventory. The research question was, “Is there an association between adult learner assets of social capital and their readiness for SDL?”

Methodology

Sample

For this study, a survey design was used with trainees and adult learners from different locations in three Canadian provinces: Manitoba, Ontario and Nova Scotia. The 115 participants were employees of workplace programs providing learning opportunities to improve or upgrade essential skills, adult learners enrolled in a job readiness program preparing for entry into the workforce, and adult learners enrolled in an academic program seeking further education opportunities. Overall, 67% of the informants in this study were female, 42% were in the 18-25 year old age range, and 64% were single. Racial, language, and ethnicity data were not collected from the sample.

Data Collection

The quantitative data were collected through the administration of two assessments. The Social Capital Inventory (SCI) was developed and piloted at the University of Ottawa, Ontario, Canada. This tool is comprised of 24 items which are divided into four 6-item subscales. The first subscale - *Network Qualities* (NQ) includes sub-concepts of trust levels, efficacy and diversity. The second sub-scale - *Network Structure* (NS) measures sub-concepts of network size and communication mode, while the third subscale - *Network Transactions* (NTr) focuses on sub-concepts of sharing support and sharing knowledge. The final sub-scale integrates sub-concepts of bonding, bridging, and linking and is referred to as *Network Types* (NTy). Psychometric analysis of data obtained for the present study yielded an overall Cronbach's alpha of .96, which indicates a high level of internal consistency. Cronbach's alphas in the .8 – 1 range are generally considered to indicate adequate to excellent internal reliability (George & Mallory, 2003; Nunnally & Bernstein, 1994).

The Self-Directed Learning Readiness Scale (SDLRS) was also employed. The SDLRS is a self-administered questionnaire that was designed to measure “the complex of attitudes, skills, and characteristics that comprise an individual's current level of readiness to manage his or her own learning” (Guglielmino & Associates, 2012, p. 1). For the purpose of this study, the *SDLRS-S – The Learning Preference Assessment*, a 58-item, self-scoring version was implemented, so that the learners could view their results immediately upon completion. Both instruments are self-report measures using five-point Likert-type scales. A total of 115 trainees/learners completed both the SCI and SDLRS. Biographical information, including age, gender, and marital status were also obtained as part of the questionnaire. In addition, participants were asked to list any clubs or groups to which they belonged as an indication of their network structures that may occur within or outside of the workplace.

Data Analysis

The data were analyzed as follows. First, participants' overall scores on the SCI and SDLRS were calculated. The overall scores on the SCI were determined by summing responses to each of the 24 items. The potential range was 24-120. Following the instructions of the author, participants' overall scores on the SDLRS were calculated for the 58 items on the scale; the potential range was 58-290.

The Statistical Program for the Social Sciences (SPSS) was employed to conduct the remaining analyses. A Pearson correlation coefficient was computed to assess the relationship between participants' scores on the SCI and the SDLRS. Further, an exploratory factor analysis (EFA) using Principal Axis Factoring with Promax rotation of the 24 items from the SCI was conducted to identify underlying dimensions, thereby allowing for possible revision of the previously proposed four subscales (NQ, NS, NTr, and NTy). Relationships between self-directed learning readiness and each of the dimensions of social capital identified through factor analysis were also examined.

Results

Mean Scores

The mean score on the SCI was 94.83 (SD = 12.10). This value indicates a moderate to high level of social capital. In particular, participants tended to agree that they had access to supportive social networks and services; that there is trust, respect, and openness within their social networks; that there is reciprocal sharing within these networks; and that they have the confidence and ability to make links with individuals/services that have different perspectives from their own.

The mean score on the SDLRS was 222.74 (SD = 26.19). This value indicates average readiness for self-directed learning according to norms provided by Guglielmino and Associates (2012).

Examination of Relationship Between the Scores

A Pearson correlation coefficient analysis revealed a positive relationship between the two measures that was not statistically significant at the $\alpha = .05$ level, $r(112) = .16, p = .09$, two-tailed. However, as one of the primary purposes of this study was to further explore the relatively new measure of social capital and what exactly it is, and is not, measuring, we have chosen to discuss any relationships that approach statistical significance. Obtaining validity evidence of an instrument such as the SCI is an ongoing process in which evidence accrues, rather than being found in a single relationship or in a single study, with each potentially informative result adding to this evidence to provide a clearer picture of what the instrument is measuring. As well, the results obtained here seem to make sense theoretically. All of this was taken into consideration when choosing to report this and other relationships that approach statistical significance in this paper. Nonetheless, we qualify these findings as being tentative with the recommendation that further investigation is needed to provide additional support.

Factor Analysis of the SCI

In order to assess the factorability of the data on the SCI, the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity were carried out. The KMO was .81, above the recommended value of .6, and Bartlett's test of sphericity was significant, $\chi^2(276) = 1010.27, p < .001$. Given these indicators, factor analysis was conducted with all 24 items using Principal Axis Factoring. The analysis revealed a four-factor solution in which the first factor explained 28.57% of the variance, while the second, third, and fourth factors explained 5.42%, 3.61%, and 3.20% of the variance, respectively (See Table 1). Factors were interpreted by items that had loadings greater than .32 and did not cross-load onto other factors. As seen in Table 1, the pattern of factor loadings did not correspond with the four sub-scales of social capital initially proposed. Rather, factor 1 was labelled as *Social Life Networks*. Factor 2 was labelled as *Social Connections in a Training Environment*, factor 3 was labelled as *Membership in Social Structures*, and factor 4 was labelled as *Cultural Networks*. Pearson correlations indicated that whereas all four factors were positively correlated with scores on the SDLRS, only the relationship with the first factor, Social life networks, approached statistical significance, $r(111) = .17, p = .08$ (see Table 1).

Conclusion and Implications for Adult Education Theory and Practice

In this study, social capital and self-directed learning were only weakly related, at levels that did not reach statistical significance. Having a greater store of social capital does not necessarily prepare one for self-directed learning. It may be that both readiness and resources are required for successful self-directed learning, but possessing one does not guarantee the other.

Although, in general, participants in the study had a moderate to high level of social capital and average to above average readiness for self-directed learning, statistical analysis demonstrated only a small, non-significant correlation between them. Thus, it appears that the SCI and SDLRS measure somewhat independent constructs. As indicated before, the SCI measures the social resources (i.e., connections) that a person has. On the other hand, the SDLRS measures more subjective feelings of being ready to direct one's own learning. Thus, it might be argued that the type, quantity, and quality of social connections that one has are but a few of the many factors that help one feel prepared for self-directed learning.

Identification of underlying factors that were intended to be measured by the SCI is of interest in order to better understand the link between feeling prepared for self-directed learning and social capital. The SCI was intended to measure four dimensions of social capital. These were: *Network Qualities*, *Network Structure*, *Network Transactions*, and *Network Types*. However, factor analysis indicated the SCI was actually measuring different distinct aspects of social capital. When the first factor, *Social Life Networks*, is further examined, it becomes apparent that it relates to the definition of social capital provided by Coleman (1988). He considers resources in family and in community as critical units that contribute to social development. The

second factor, *Social Connections in a Training Environment*, and the third factor, *Membership in Social Structures*, seem to revolve around the use of social connections

Table 1. *Factor Loadings and Eigenvalues of Exploratory Factor Analysis of the SCI¹ (N = 111)*

Item	Factor Loadings ²			
	Factor 1	Factor 2	Factor 3	Factor 4
I have taken action to solve some part of a local problem in my neighbourhood or community.	.82	-.19	.09	.05
I have helped a person in this training group to learn something new.	.70	.07	-.05	-.07
I give and receive emotional support and encouragement by working together in this training group.	.06	.70	-.18	.05
I find this training group to be supportive because we help one another in class.	.19	.57	.06	-.11
By doing group work in this class, I feel more self-confident in interacting with new groups, organizations, and service providers.	-.09	.02	.72	.10
I believe that I can now access new public services and resources that I was not familiar with before.	.03	.06	.57	-.03
I now have the self-confidence to interact with new groups whose first language is different than mine.	-.12	.16	-.27	.87
I have many things in common with my peers in this group whose first language is different than mine.	.18	-.11	.04	.61
Eigenvalues	7.42	1.86	1.39	1.35
% Variance Explained	28.57	5.42	3.61	3.20
Correlation with SDLRS	.16*	.14	.15	.11

¹ Only a representative sample of items is shown.

² Factor loadings greater than .32 appear in bold.

* $p < .10$

for developing mutual exchange. Drawing on the definition of social capital suggested by Putnam (1993), existence of networks of social connections is critical with respect to

a tendency toward mutual sharing and trust. The fourth factor, *Cultural Networks*, can be traced back to the earlier works of Bourdieu (1984).

Our results indicate that only the first of these four factors is associated with self-directed learning readiness at a level that approaches statistical significance. Other types of capital, however, may also be linked to feelings of preparedness for self-directed learning. For example, financial capital may have had an influence on how individuals view their abilities to seek out resources needed for a self-initiated learning project or some other type of informal learning activity. For the adult students enrolled in the job readiness program and the academic upgrading program, the financial resources available for use in any type of non-formal or informal learning were extremely limited. If there was any financial value to their assets, it was dispersed quickly for surviving and living from day to day. The luxury of wanting to learn for the sake of learning and identifying knowledge resources outside of the formal classroom that may cost money was overshadowed by the need for meeting monthly rent and trying to put food on the table. Cultural capital may also be a factor related to feelings of preparedness for self-directed learning; in particular, Bourdieu's (1986) notion of institutionalized cultural capital. The trainees involved in the study possessed minimal amounts of academic credentials or qualifications, even though all of them were already employed by the company and were sponsored to enroll in the upskilling program. This lack of cultural capital and, in particular, a lack of institutional recognition may have had a bearing on their beliefs and efficacy to pursue learning initiatives on their own.

While SDL may be seen as an autonomous activity, it takes place and is influenced, consciously or unconsciously, by the social-cultural context (Brookfield, 1985, Cafferella, 1993, Merriam, Caffarella & Baumgartner, 2007). All of the participants were adult learners engaged in formal learning to improve their future prospects; they had already been through a process of self-reflection and consciously decided to participate in further learning in a formal setting. As noted by Portes (2000), it is important to distinguish the resources themselves from the ability to obtain them by virtue of membership in different social structures (p. 5). The process of self-reflection and decision-making followed by the search for, discovery of and participation in formal learning occurred within and was influenced by the socio-cultural contexts in which they found themselves.

Within these contexts, the participants potentially had access to a wide range of sources and resources of social capital. The degree to which they had legitimate access to the sources and resources and the degree to which they were either positively influenced or limited by their social-cultural environments was not determined, but is nonetheless relevant. Interests and one's degree of freedom and autonomy can become either supported or distorted by a wide range of influences, and participation in SDL and the related dialogue requires full knowledge about alternatives as well as freedom from self-deception and coercion (Mezirow, 1985). As previously asserted, individuals engaged in SDL are in a complexity of conscious and unconscious negotiations within their socio-cultural environments, which has significant potential to influence their decisions. Regardless of degree or quality, it is a given that the participants' social capital was such that it afforded access to individuals and information that revealed formal learning opportunities that supported their learning goals. Since the individual

histories of the participants remain largely unknown, however, the type and degree of influence that the socio-cultural environment played in their decisions is also unknown. In the relationship of social capital and SDL, understanding of the socio-cultural context in which learners find themselves would also be worthy of research.

It should also be noted that this study does not speak to the causal relationship between these two constructs. It could be that social resources are a precursor leading to feelings of readiness to learn. But, it might alternatively be that feelings of readiness to learn cause one to seek out and build social support structures to carry out learning. Future research will be needed to determine the causal order of, and additional factors involved in, the relationship between social capital and self-directed learning readiness.

A further limitation of this exploratory study rests on the fact that the results may also reflect some weaknesses of the newly developed SCI, which has not yet been fully validated. Although the author-developed survey has been tested in adult basic education populations in various regions of Canada, further exploration of the factors and a more rigorous sampling procedure using other populations is required. For example, conducting studies using the SCI with youth at risk through community colleges and clients seeking direct employment through career counselling agencies in various economic locations may further shed light on the construct validity of the instrument.

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