Modelling self-regulated learning strategies in early-stage entrepreneurs: the role of intentionality and interaction

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Abstract: This research investigates entrepreneurs from a psychological perspective, with a focus on the strategies entrepreneurs use to manage or self-regulate their learning, an area which has largely been ignored in past research with regard to entrepreneurs. The sample consisted of 11 nascent entrepreneurs and new business owners who had started ventures in the sectors of business or consumer services in the last two years. Participants were recruited from a variety of sources throughout Ireland, including university incubator centres, entrepreneurial network groups, enterprise boards, and information and support services for entrepreneurs. The entrepreneur's self-regulated learning strategies were assessed using an in-depth, focused interview. Analysis of the results unravelled the complex network of strategies employed by entrepreneurs to manage their learning and knowledge acquisition in the early stages of a new venture. As such, this research demonstrates that entrepreneurial learning is self-regulated, and can be viewed along the dual continuation of:

- the level of intentionality of the learning

- the level of interaction with other individuals or the environment.

Although this research reports on an early-stage, preliminary investigation of a wider study, the examination of the self-regulation of learning and knowledge acquisition can provide valuable insights into the decision-making processes of entrepreneurs and of the process of venture creation more generally.

Keywords: self-regulated learning; self-regulation; entrepreneurial learning; informal learning; work-based learning; psychology of entrepreneurship; learning strategies.

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1   Introduction

The study of entrepreneurship from a psychological perspective is an emerging theme in the literature, with the main premise of such research suggesting that entrepreneurship is fundamentally personal, whereby it takes human vision, intention and work to conceive and convert business ideas to successful products and services (Baum *et al*., 2007). Rauch and Frese (2000) suggest that entrepreneurship research can profit from such a perspective because psychological variables are clearly and consistently linked to entrepreneurial entry and success. This research investigates entrepreneurs from such a psychological perspective. The aim of the present study is to investigate the process through which entrepreneurs regulate one aspect of their knowledge acquisition, *i.e.*, their learning. We present a model of the strategies that early-stage entrepreneurs use in the self-regulation of learning and knowledge acquisition, which demonstrates that entrepreneurial learning is informal in nature, self-regulated, and can be viewed along the dual continuation of:

1   the level of intentionality of the learning

2   the level of interaction with various interaction partners or with the environment.

2   Self-regulation and entrepreneurship

Baron (2007) suggests that entrepreneurship should be viewed as "a continuous, evolving process rather than a single event or a series of unrelated events" (p.19). The defining characteristic of the entrepreneur and of entrepreneurship is that the entrepreneur always searches for change, responds to it and exploits it as an opportunity (Drucker, 1999). We argue that how entrepreneurs self-manage the acquisition of knowledge within this

process is of the utmost importance. Fiet (2007) has already suggested a theoretical link between self-regulated learning and entrepreneurial search and discovery, suggesting that individual volition plays a role in successful discovery.

Self-regulation can be defined as a "multi-component, multi-level, iterative, self-steering process that targets one's own cognitions, affects, and actions, as well as features of the environment for modulation in the service of one's goals" (Boekaerts *et al*., 2005, p.150). It has been argued that everyone attempts to self-regulate his or her functioning in some way to gain goals in life, but what distinguishes effective from ineffective forms of self-regulation is the quality and quantity of one's self-regulatory processes (Zimmerman, 2000). The activities of entrepreneurs are of high complexity and they often have to act within unknown and unpredictable environments. Therefore, entrepreneurs will tend to need to regulate more tasks on the conscious level of regulation than other occupations (Frese, 2007).

Lans *et al*. (2004) define entrepreneurship as a certain mindset and process associated with individuals, who possess a set of competencies (*e.g.*, creativity, risk-taking), showing these competencies in distinctive entrepreneurial behaviour (*e.g.*, turning a business idea into success), alongside daily management. Hence, although self-regulation has rarely been explicitly studied in entrepreneurs, there is a clear overlap between the definition of the process that an individual entrepreneur goes through in achieving new venture success and the process of self-regulation. The work of Michael Frese and colleagues, has examined the role that self-regulation may play as a psychological success factor in entrepreneurship, drawing largely on Action Theory (Frese and Zapf, 1994; Frese, 2007). Frese *et al*. (2007) found that elaborate and proactive planning (aspects of the self-regulation process) by business owners was substantially related to various success factors, in addition to being a partial mediator of the relationship between cognitive resources and business success. Furthermore, Kraus (2003) has established that self-regulation or reciprocal determinism is evident in the relationship between Entrepreneurial Orientations (EO), strategy process characteristics and business performance, and correctly concludes that a comprehensive psychological approach to entrepreneurial performance must incorporate self-regulatory processes.

3   Self-regulated learning and informal learning contexts

Self-regulated learning can be viewed as an application of self-regulation that has primarily been studied in the realm of formal education and studying, and hence, has been largely ignored in past research into work-based learning and more specifically, entrepreneurial learning. Self-regulated learning can be defined as *a complex interactive process involving not only cognitive self-regulation but also motivational self-regulation* (Boekaerts, 1997, p.161). Self-regulated learning models allow researchers to describe the various components involved in successful learning and knowledge acquisition, and directly relate learning to goals, motivation, will and emotions (Valle *et al*., 2003). Zimmerman (2002) defines *self-regulated learning* not as a mental ability or an academic performance skill, but as a *self-directive process* by which learners transform their mental abilities into skills. From this perspective, learning is seen as an activity that individuals do for themselves in a proactive way, rather than as a covert event that happens to them in reaction to an environmental stimulus (such as teaching).

Boekaerts and Minneart (1999) attempted to model Self-Regulated Learning (SRL) within informal learning environments. Informal learning takes place on the job and may not always be planned, with control of the learning resting primarily in the hands of the learner (Boekaerts and Minneart, 1999; Marsick and Watkins, 1997). Results of the study by Lans *et al.* (2004) suggested that non-formal and informal learning seem to play an especially important role in the competence development of entrepreneurs. Similarly, Morrison and Bergin-Seers (2002) report that the owner-managers in their sample expressed a disinclination to participate in formal learning programmes, and exhibited a disposition towards learning in a practical and experiential way, mainly through informal mediums, with the preferred model being networks. Boekaerts and Minneart (1999, p.536) outline a number of attributes of informal learning, which link self-regulated learning to the informal learning context, and as such, are important considerations in the present investigation:

- The learning process is described as active, voluntary, self-discovering, self-determined, open-ended, non-threatening, enjoyable and explorative.

- Learners use a number of self-regulatory processes spontaneously, such as self-initiated learning and self-monitoring their progress.

- Most informal learning is embedded in a social context, meaning that social cues are highly relevant. These socially situated learning activities are loosely structured, learner-directed, and mediated by peers who often share the same values, attitudes, interests, and beliefs.

- Informal learning situations utilise realistic objects, materials or settings that are highly contextualised.

- There is no compulsory, individual testing or assessment procedure, but rather a collective, informal type of assessment or self-assessment based on feedback.

Together, Boekaerts and Minneart (1999) suggest that these attributes of informal learning produce a natural form of learning that gives individuals the impression that they learn spontaneously and without much conscious effort. This mirrors the experiences of many entrepreneurs in previous research. For example, Sexton *et al.* (1997) reported that entrepreneurs engaged in learning processes that were more reactive than proactive, wanted to learn from other entrepreneurs, and wanted information presented in the context of their environment.

No research to date has explicitly considered the role that self-regulated learning plays in an entrepreneurial context, with the exception of the work of Haynie *et al.* (2004), who considered the role of metacognition (considered by some to be a precursor to self-regulated learning; see Pintrich *et al.*, 2000) in entrepreneurial decision making. Haynie *et al.* (2004) suggest that metacognition is naturally suited to studying individuals engaged in a series of entrepreneurial processes, and for examining cognitive processes across a series of entrepreneurial endeavours. In addition, they suggest that given the dynamism and uncertainty of entrepreneurial contexts, metacognition facilitates studying how entrepreneurs cognitively adapt to their evolving and unfolding contexts. Results suggested that individual differences in metacognition could explain differences in the way that people think strategically. However, their sample consisted of undergraduate students, and so, did not pertain specifically to entrepreneurs. Hence, no research to date has considered the self-regulation of learning and knowledge acquisition in actual

entrepreneurs, despite the fact that Reuber and Fischer (1999) argued that what is needed is to understand more deeply *how* entrepreneurs learn from formative experiences through the identification of entrepreneurial learning 'mechanisms' (Cope, 2003, p.430). This remains a key research objective (Cope, 2003). The investigation of self-regulated learning offers a more comprehensive account of learning strategies that one may be engaged in, moving beyond the restriction of the cognitive model.

Effective self-regulated learning involves the use of various learning strategies, but the conceptualisation of such strategies varies. Learning strategies are defined as the behaviours or thoughts that a learner engages in during learning which have an effect on the learner's encoding, storage, organisation and retrieval of knowledge (Ford *et al*., 1998; Weinstein and Meyer, 1986). They are generally viewed as varying within, as well as between, individuals, and the general assumption is that principal strategies are positively associated with effective learning (Warr and Downing, 2000). They have been examined in terms of higher order metacognitive control over learning, as well as practice strategies that are applied directly to the learning materials (Ford *et al*., 1998). Hence, one of the central propositions of this research is that entrepreneurs engage in various strategies to self-regulate their learning in order to progress their new venture.

Proposition 1   Entrepreneurs engage in specific strategies to self-regulate their learning in the early stages of a new venture.

4   Learning in a work environment

Entrepreneurial learning can be viewed as a form of work-related learning, although the entrepreneurial setting cannot be said to be typical of all work contexts. However, one can expect that previous research on work-related learning will have relevance to the entrepreneurial context too. In addition, models of work related learning have a number of overlapping features with models of self-regulated learning. Simons and Ruijters (2001) define work-related learning as the *implicit* and *explicit* kinds of learning of working people at *individual, group and organisational levels*. Extending this definition, Doornbos *et al.* (2004) view work-related learning as an integrated process involving the interaction between workers and their environment and as an internal process of inquisition, elaboration and construction leading to a learning result. From a non-educational perspective, work-related learning can be characterised in terms of the following principles:

- Work-related learning processes happen implicitly and in addition to more explicit learning.

- Work-related learning can be characterised by direct or indirect interaction with a variety of interaction partners (Doornbos *et al.*, 2004).

As such these characteristics overlap with the informal level in Boekaerts and Minneart's (1999) model, whereby it is suggested that individuals learn in a social groups and in a realistic context, and also with Zimmerman's (1989; 2000) social cognitive theory of self-regulated learning.

Simons *et al.* (2000) argue that generic learning outcomes such as learning, thinking, collaboration and regulation skills need to be considered as constituting a new balance between three ways of learning: guided instruction, experiential learning and Self-Directed Learning (SDL). For *experiential learning*, learning is a side effect of the activities one undertakes, and an explicit set of learning goals do not exist. In contrast, in *SDL*, the learner plays an active and explicit role in the learning process and the determination of learning goals (Doornbos *et al.*, 2004). Simons (2000) argues that SDL should be conceived of as an active constructive form of learning in which learners are becoming better and better in designing their own learning environments. When learning is self-directed, it is self-organised and self-planned, and learners determine their own ways of self-testing (Simons, 2000). Doornbos *et al.* (2004) argue that the concept of intentionality is very relevant in the work environment and captures both the implicit and explicit nature of work-related learning. Being able and ready to learn as a self-directed learner hence means being able and ready to execute learning functions, such as being ready to prepare learning independently, to execute the executive learning functions independently, and to close learning independently (Simons, 2000).

The theorised relationship between SDL and more experiential learning, within the spectrum of work-based learning has not been explicitly addressed within the entrepreneurship sphere. However, the findings of two recent studies suggest that it is very pertinent. Unger (2006), using a cognitive model of learning, found that deliberate practice had a strong direct effect on entrepreneurial knowledge as well as an indirect effect on business growth. Doornbos *et al.* (2004) make a distinction between deliberate learning and deliberate practice. Although they acknowledge that Sonnentag and Kleine (2000) apply the concept of deliberate practice to work settings, they prefer to use the concept of deliberate learning, as it is broader and does not require performance of the activity on a regular basis. They also distinguish deliberate learning from SDL. The two critical differences from their perspective are:

1   In the case of SDL, both resource management and planning and motivational control and evaluation of the learning attempt are explicitly present.

2   In the case of deliberate learning, the conscious decision and intention to learn is the focus (Doornbos *et al.*, 2004).

On the more experiential learning side, the work of Gielnik *et al.* (2007) suggests that this is also relevant with the entrepreneurship context. Gielnik *et al*. (2007) report on a study currently underway which examines the role of three learning strategies, namely reflective observation, abstract conceptualisation, and active experimentation (drawn from Kolb's (1984) theory of Experiential Learning) in the development of knowledge and success. Results indicate that reflective observation and abstract conceptualisation accounted for a significant amount of explained variance in entrepreneurial knowledge, and the sum of all three learning strategies was significantly related to entrepreneur's success. These results provide a good argument for the examination of learning strategies with regard to the ways in which entrepreneurs self-regulate their learning in their chosen work context. We propose that in line with a work-based model of learning, entrepreneurs will use both self-directed, as well as more experiential learning strategies in the process of knowledge acquisition and learning.

Proposition 2   *Entrepreneurs will demonstrate learning strategies which reflect both implicit and more explicit learning processes.*

The conceptualisation of work-based learning outlined above has clear overlaps with self-regulated learning, and maps quite well onto previous findings in relation to entrepreneurial learning. Cope (2005) conceives of entrepreneurial learning as learning experienced by the entrepreneur during the creation and development of a small enterprise, rather than a particular style or form of learning that could be described as entrepreneurial. Furthermore, Gielen *et al.* (2003) describe the entrepreneur as the professional learner within small companies, and argue that learning and innovation are major parts of entrepreneurship. The learning process occurs from the very outset of organisational development, and is particularly relevant to nascent activities, and it is this learning process which eventually determines the strategic direction of the organisation (Honig, 2001). Ravasi and Turati (2005) state that learning in an entrepreneurial venture seems to resemble more what, in the management field, has been termed higher level, generative learning, as opposed to lower level, adaptive learning. Furthermore, learning in an entrepreneurial venture has a creative component that goes beyond repetition and incremental optimisation, occurring in ambiguous contexts and often involving the development of completely new solutions or radically innovative products (Ravasi and Turati, 2005). Learning takes place as entrepreneurs gradually manage to make sense of the connections between the different technical subsystems, product functions, customers' preferences, market structures and so on (Weick, 1995). Hence, it would appear that both the areas of work-related learning and self-regulated learning in informal contexts can further the research with regard to how entrepreneurs learn.

In an organisational context, learning strategies are relevant to a number of important areas, such as training and the transfer of training, innovation and performance management (Holman *et al.*, 2001). However, little or no research has focused on which learning strategies are effective for acquiring skills in cognitively complex, dynamic tasks (Ford *et al.*, 1998), such as those faced by entrepreneurs. The ways and means with which individual entrepreneurs go about learning and managing their learning in varying contexts and on different topics is of the utmost importance, especially as they start out in their venture. Research by Ford *et al.* (1998) found that learning strategies were related to multiple learning outcomes of knowledge, final training performance and self-efficacy, with metacognitive activity being the most important strategy. Individuals who monitored their learning, tried to diagnose where they were having difficulties and adjusted their behaviour accordingly developed greater knowledge of the task, better performance strategies, and greater confidence in their task capabilities (Ford *et al.*, 1998).

Hence, in addition to the preceding propositions, we also suggest that entrepreneurs will structure their environment in such a way that they utilise learning strategies that involve both interaction with other people, such as the observation of experts at work, as well as more internal strategies that may be involved in deliberate practice and do not involve interaction with other people:

Proposition 3   *(i) Entrepreneurial learning will be characterised by direct or indirect interaction with a variety of interaction partners, and (ii) Entrepreneurs will regulate contact with these interaction partners.*

5   Methodology

5.1   Sample

The sample consisted of 11 nascent entrepreneurs or new business owners, who had started ventures in either the sectors of business services or consumer-oriented services in the last two years, as classified using recommendations in the 2005 GEM report (Minniti *et al.*, 2006). Based on this classification system, four of the enterprises were in the business services sector, two were consumer-oriented and five provided services to both businesses and consumers. These individuals formed an initial sub-sample of a larger study underway. The participants were recruited from a variety of sources throughout Ireland, including university incubator centres, entrepreneurial network groups, enterprise boards and information and support services for entrepreneurs. All the participants were male, between the ages of 30 and 43, with an average age of 35.64 years.

  Nascent entrepreneurs were defined as individuals who had taken some action towards creating a new business in the past year, owned a share of this business and the business must not have paid any wages or salaries for more than three months (Bosma and Harding, 2007). *New business owners* were defined as individuals who were active as owner-managers of a new business that had paid wages or salaries for more than three months, but less than 42 months (Bosma and Harding, 2007). Based on these definitions, the sample consisted of two nascent entrepreneurs and nine new business owners. Furthermore, four of the participants were sole owners of their company, while the other seven owned a share in the new enterprise.

5.2   Operationalisation of the variables

Self-regulated learning was investigated through the use of an in-depth, focused interview. This interview combined the use of the Critical Incidents Technique (Flanagan, 1954; Chell, 1998), a variation of the Self-Regulated Learning Interview Schedule (Zimmerman and Martinez-Pons, 1986; Zimmerman and Martinez-Pons, 1988; Zimmerman and Martinez-Pons, 1990) and a process-oriented self-regulated learning interview schedule (Järvelä and Salovaara, 2004; Salovaara, 2005) in an attempt to innovatively tap into the self-regulated learning process of entrepreneurs. In line with recommendations by Chell and Pittaway (1998) for the conduct of a critical incidents interview, participants were asked to complete a timeline at the start of the interview. They were asked to work backwards, and mark along the length of the timeline times when they learned or needed to learn really critical skills or knowledge, focusing specifically on knowledge that they acquired or skills that they learned which were very important for them in becoming an entrepreneur or starting their own business. Following this, the participants were asked to pick two incidents which represented skills or knowledge which they perceived to be the easiest and the most difficult to acquire respectively. For each, the participants were then asked a series of questions relating to the learning strategies they employed during this event, as well as questions relating to their overall goals in learning this skill or knowledge, how they kept track of their progress, and questions relating to volitional processes.

5.2.1 Demographic information

A number of demographic questions were asked to provide background details about the entrepreneur. These demographic questions were based on previous research with entrepreneurs (Drnovsek and Glas, 2001; Honig, 2001; Katz *et al*., 1993), and were included in a questionnaire which participants completed following the interview. These included questions pertaining to age, gender, education and training, previous work experience and whether the individual had any friends or relatives who were entrepreneurs.

5.3 Procedure

Following agreement to take part in the research, participants were met by the researcher at a location of their choice. A semi-structured interview was used to assess the participants' self-regulated learning. An interview protocol was developed to guide the researcher in conducting the interviews, which served as the script for conducting the interview, and began with introductory statements (the purpose of the research and how the results would be used), directions for participants, and informed consent. In line with Whipp and Chiarelli (2004), it was explained to the participants at the outset, that the study was an effort to obtain a better understanding of how entrepreneurs approach and manage their learning in various contexts. The majority of questions were open-ended, and probes were used where necessary to ensure the session stayed focused. Following the interview the respondents were asked to complete a questionnaire, which included demographic information, and well as other variables which formed part of the wider research project.

Interviews were recorded and notes were also taken where appropriate to allow further probing into participants' answers where necessary. Following the completion of the interview, it was transcribed and entered into NVivo. All data was read a number of times in order to familiarise the researcher with the content, and to obtain a general sense of the information and reflect on its general meaning (in line with recommendations by Creswell, 2003). Qualitative content analysis (Chi, 1997) was used to analyse the interview transcripts. The learning strategies identified by the entrepreneurs were identified and coded. Coding the interview data used both an inductive and deductive technique. In line with previous research (Salovaara, 2005), this approach was chosen to keep the analysis open for possibly emerging categories and themes. The initial coding instrument was based on the previous learning strategies identified in the literature on entrepreneurial and work-based learning (Cheetham and Chivers, 2001; Gielnik *et al*., 2007; Lans *et al*., 2004; Miner and Mezias, 1996; Simons and Ruijters, 2001; Unger, 2006), which are outlined in Table 1.

Table 1   Learning strategies previously identified for deductive coding

Source	Type of learning	Learning strategies	
Cheetham and Chivers (2001)	Learning processes in informal learning	1	Practice and repetition
		2	Reflection
		3	Observation and copying
		4	Extra-occupational transfer
		5	Stretching activities
		6	Perspective changing/switching
		7	Mentor/Coach interactions
		8	Unconscious absorption or osmosis
		9	Use of psychological devices/mental tricks
		10	Articulation
		11	Collaboration
Gielnik *et al.* (2007)	Experiential learning	1	Reflective observation (observing)
		2	Abstract conceptualisation (thinking)
		3	Active experimentation (acting)
Lans *et al.* (2004)	Types of informal learning	1	Study groups
		2	Business visits
		3	Research and development institutes
		4	Professional journals
		5	Pre-entry experience
		6	Learning from colleagues
		7	Self-analysis
		8	Reflection
Miner and Mezias (1996)	Key learning processes	1	Trial and error learning
		2	Inferential learning
		3	Vicarious learning
		4	Generative learning
Simons and Ruijters (2001)	Expansion (making learning more explicit)	1	Theoretical learning
		2	Inquiry learning
		3	Critical learning
Unger (2006)	Deliberate practice	1	Mental stimulation
		2	Seeking feedback
		3	Professional reading
		4	Consulting experts
		5	Exploring new strategies
		6	Attending seminars/workshops/courses
		7	Private conversation
		8	Observing others
		9	Firm meetings
		10	Controlling/Checking

6   Results

Results of the inductive and deductive coding revealed 37 different learning strategies engaged in by nascent entrepreneurs and new business owners. These strategies were grouped based on their similarity, into the themes or macro-categories of:

- searching or seeking expert knowledge

- cognitive strategies

- expansion

- informal learning

- experiential or environmental learning

- unconscious learning.

The individual strategies and examples of their evidences are shown in Table 2. Examination of Table 2 suggests that entrepreneurs use a wide variety of learning strategies in managing the knowledge acquisition process, thus providing support for proposition 1.

Support was also found for propositions 2 and 3. The strategies identified exhibit both implicit and explicit learning strategies (proposition 2), and participants demonstrated a variety of interactions with people and context in their learning (proposition 3). *Searching or seeking expert knowledge* and *cognitive strategies* appear as the most explicit learning strategies, while *experiential or environmental learning strategies* and *unconscious learning* are the most implicit. The strategies grouped under *expansion* and *informal learning* show the most evidence of interaction with the environment and individuals to aid learning.

Looking at Figure 1 also indicates a pattern of usage in terms of the learning strategies employed by entrepreneurs. The general trend seems to indicate that entrepreneurs are more likely to use *expansion* strategies than any others, and use *informal learning* strategies least often. *Experiential/Environmental* learning strategies seem to generally be the type of strategies used more often after *expansion*, with *seeking expert knowledge* and the use of *cognitive strategies* being used moderately.

Table 2   Learning strategies identified in nascent entrepreneurs and new business owners

Category	Strategy	Number of passages coded at strategy	Example
Searching or seeking expert knowledge	Attending seminars/courses/workshops	27	Attended conferences for networking, to build up, I suppose, knowledge of the industry, and my exposure to other start-ups, to maybe understand how they got access to funds or did their business planning. (P007) So, even though there is a lot of other formal educational qualifications that I would have in advance of that, in terms of bringing me to the next step or the first steps of being an entrepreneur, … it was doing those two programmes. (P009) You take advantage then of all the training courses available, where they train you. (P012)
	Consulting experts	30	Talking though the problems with people who have done it before; people who at least recognise the problem. (P006)
	Professional reading	11	I am reading every single book that I can possibly read about the area. (P006) I got a couple of reference books and worked my way through them. (P013)
Cognitive strategies	Controlling/Checking	4	I keep a track on which papers are working the best. (P004) We would have a certain set of assumptions about how they are going to be affected, and often times we find that it is completely different. (P009)
	Organising	8	I have Excel spreadsheets that sort of thing to, just to simplify the whole process. (P013)
	Practice and repetition	3	It is pure practice. (P013)
	Stretching activities	11	You have to step out of this comfort zone to sell these other things. (P004) We start with big problems, big questions, big issues, big whatever, and we hone down into the various things. (P006)

**Table 2** Learning strategies identified in nascent entrepreneurs and new business owners (continued)

Category	Strategy	Number of passages coded at strategy	Example
	Structuring knowledge	10	What you need to do is centralise everything on what are the key points that you really need to know to get everything up and running. (P014)
	Thinking	10	We are working out, what is our revenue model, how do we make money out of this thing? And, basically, talked the whole thing through. (P005)
			I went off and I thought about it, I dragged together four people – four other people, so there is five founders, and I started the company. (P006)
Expansion	Inquiry learning	6	You sit in a guy's office and you ask him what his problems are. (P005)
	Learning from colleagues	16	I met this guy …and we talked and he just drip feeded me some stuff then and next thing, you know, and we talked more and more, and next thing he told me everything he knew about the business, and different ways of doing things, and cutting costs and all that. (P004)
	Consulting customers	8	We sit down with the clients and talk to them about what they want to do. (P013)
	Networks	13	I think what we have found more successful, more than anything else is sthe whole referral network thing. (P009)
			Acquiring what we needed, just knowing some contacts in the industry. (P012)
	Business visits	3	Practically seeing that sites and seeing what I needed to be able to do to do that myself did help a lot. (P011)
	Environmental structuring	29	In fact, one of the things I do…, I basically pull people in around me. (P005)
			What I did was pretty much picked the best of the people that I knew, and all of them joined as a result. (P006)

Table 2   Learning strategies identified in nascent entrepreneurs and new business owners (continued)

Category	Strategy	Number of passages coded at strategy	Example
	Exploring new strategies	3	I started as well as that, trying to sell other products. (P004)
	Active experimentation	5	Learning about the software and actually getting my hands on it and playing with it, and setting it up, and- playing with it is what I kind of enjoy. (P011)
	Observation	5	I was being paid, I learned something huge and I saw it being put in action. (P007)
	Reflection	16	How quickly did I learn from that experience. It is probably only now that I am really trying to piece together the issues. (P005)
			In the morning we talk before and in the afternoon we talk post, and see, you know, what information did we get that we can put on to our customer relationship management tool. (P009)
	Searching for opportunities	23	Keep your antenna out to know when the rules change. (P005)
			So we started to look for an opportunity about three years ago. (P009)
	Vision development	12	Honestly, probably one thing, which was for this organisation, this new organisation to work we all had to have a common vision of what it was we were buying into. (P009)
	Research	12	You have to go and do a bit of research yourself. (P013)
	Seeking feedback	13	You still need to go out and just give it to the people to test it anyway. You have to do that. (P008)
Informal learning	Brainstorming	2	It was a deliberate couple of weeks of brainstorming. (P006)
	Collaboration	12	You have to have collective decisions on, and different points of view. (P014)
	Firm meetings	13	Need to have strategy in place/know what want to get out of the meeting. (P005)

Table 2 Learning strategies identified in nascent entrepreneurs and new business owners (continued)

Category	Strategy	Number of passages coded at strategy	Example
Experiential/ Environmental learning	Extra-occupational transfer	6	It was such a key skill to have, and I did not realise that I was going to get it. (P006)
	Pre-entry experience	31	The customer relationships I learned in my first job. (P006)
	Generative learning	15	You know, it is nearly self-correcting, you find out, you do one job and then you say, Jesus, I spent three times more time on that than I thought I was going to. So the next time a similar job on that comes up you have that experience. (P013)
	Incidental learning	10	It was a bit of a branch-off for me. But that was interesting and it came fairly naturally alright. And as I said, it is something I still use. (P013)
	Learning from failure	6	I think, a skill or a knowledge set in there is, I guess, managing failure, or accepting failure. (P007)
			Even the bad outcome I would say probably freed us up a lot. (P009)
	Action learning	24	The real learning is when you do it yourself. (P004)
	Learning from family	6	I spoke to my brother, who had set up a business. (P007)
			My sister is a business mentor. (P009)
Unconscious learning	Innate characteristics	1	I would say that those things were sort of innate characteristics in someone. I do not think you can probably learn. (P010)
	Osmosis	1	I am not sure whether it was something that I learned, or that I just know how to do, or assumed that I knew how to do and just did it. (P006)

Figure 1   Frequency of learning strategy use
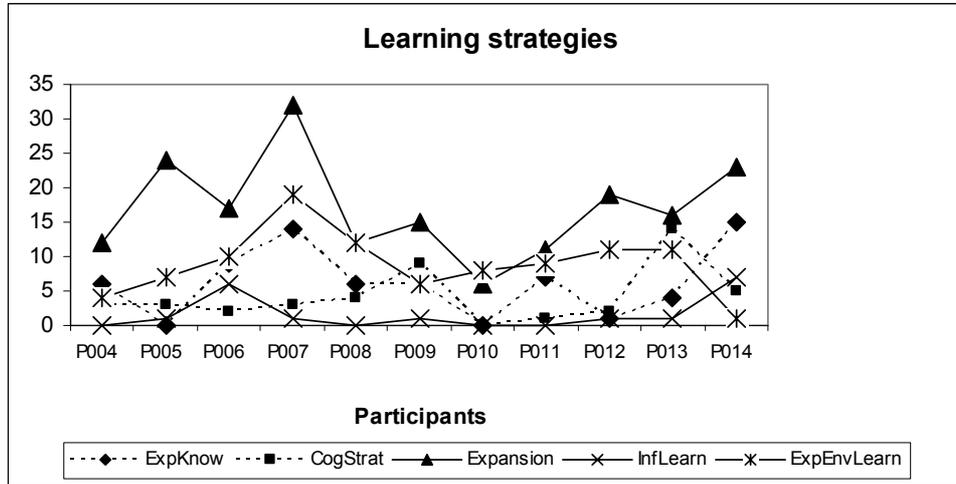
Notes: ExpKnow = Seeking or searching for expert knowledge.
          CogStrat = Cognitive Strategies.
          Expansion = Expansion strategies.
          InfLean = Informal Learning strategies.
          ExpEnvLearn = Experiential or Environmental learning strategies.

7   Discussion

Recent advances in the psychology of entrepreneurship have tried to explain why entrepreneurs are more willing than their counterparts to bear environmental uncertainty (McMullen and Shepherd, 2006), with such approaches representing an example of 'psychological context' (Shapiro *et al.*, 2007, p.132). From the perspective of entrepreneurial action, whether an individual will engage in a particular action is a decision that depends on whether the individual is motivated enough to act, given the uncertainty he or she expects to encounter in pursuit of an opportunity (McMullen and Shepherd, 2006). Hence, action depends on psychological context, as well as environmental context. The findings of this study represent an application of this perspective to the process of learning and knowledge acquisition in the early stages of a new venture. The findings clearly demonstrate a role for both the psychological and environmental context in the process of entrepreneurial learning and knowledge acquisition. In addition, the results suggest that these two contexts are not mutually exclusive but interact, so that both play a role in reciprocally shaping each other in order to allow the entrepreneur to acquire key knowledge, skills, abilities and competencies in starting a new venture.

   Analyses of the results unravelled the complex network of strategies employed by entrepreneurs to manage their learning and knowledge acquisition in the early stages of a new venture. The results revealed that entrepreneurial learning and knowledge acquisition is both implicit and explicit in nature, involving varying levels of interaction with the environment and other individuals, and importantly that entrepreneurs do engage in designing their own learning environments, which is in line with Simons' (2000)

theorising on work-based learning. The findings of the qualitative data analysis appear to indicate that in an entrepreneurial context, self-regulated learning strategies may be conceptualised along two dimensions:

1   the level of intentionality

2   the extent to which the learning is individual or interactive.

Figure 2 illustrates this conceptual model.

Conceptualising the self-regulation of entrepreneurial learning in this way demonstrates that while some learning strategies employed by entrepreneurs fall into the typical definition of SDL, and are both highly individual and deliberate, entrepreneurs may also position themselves strategically in their environment so as to take full advantage of interactions with individuals. Similarly, Figure 2 suggests that the learning strategies that have previously been identified for entrepreneurs (*e.g.*, Gielnik *et al.*, 2007; Unger, 2006) can be integrated with previous research on informal and work-based learning strategies (*e.g.*, Cheetham and Chivers, 2001; Lans *et al.*, 2001; Simons and Ruijters, 2001) to provide a more complete picture of how entrepreneurs manage the knowledge acquisition process.

Conceptualising entrepreneurial learning along the dimension of intentionality fits well with previous theories of self-regulation and self-regulation learning. Frese (2007) proposes that from an action theory perspective, the action structure is concerned with the hierarchical cognitive regulation of behaviour. Action theory distinguishes three task-oriented levels of regulation and one metacognitive level:

1   *The skill level of regulation*: The lowest level of regulation which regulates situationally specific automatised or routinised skills. The skill level of regulation is the preferred level.

2   *The level of flexible action patterns*, which consist of ready-made action programmes available in memory but must be flexibly adjusted to situationally defined parameters.

3   *The conscious level*, which is concerned with conscious regulation of goal-oriented behaviour, meaning that they are aware of how they go about a certain action.

4   *The level of metacognitive heuristics*, which concerns the knowledge of how we ourselves use the cognitive strategies.

The first two levels – the *skill level* and the *level of flexible action patterns* – are often subsumed under the term of mindlessness (Frese, 2007). Looking at Figure 2, the *unconscious learning strategies* (*osmosis* and *innate characteristics*) can be classified at the skill level, and the strategies under *experiential or environmental learning* (*e.g.*, *Incidental learning*, *Extra-occupational transfer*, *etc.*) can be classed at the level of flexible action patterns. Some of the *experiential learning strategies* (*e.g.*, *Generative learning* and *Learning from failure*) as well as the strategies under *Informal learning* (*brainstorming*, *collaboration*, *etc.*) can be classed under the conscious level of regulation. The strategies under *Expansion* and *Seeking expert knowledge* can also be included at the conscious level. Figure 2 deals mainly with the conscious levels of regulation. However, strategies such as *Reflection*, *Controlling/Checking* and *Consulting experts* are indicative of the types of strategies that may be included at the level of metacognitive heuristics (see Table 2 for supporting quotations).

Figure 2   Entrepreneurial learning strategies along the dimensions of intentionality and source

Unconscious Learning

Experiential/Environmental Learning

Informal Learning

Brainstorming

Collaboration

Firm Meetings

Seeking Expert Knowledge
Cognitive Strategies

Consulting Experts

Attending seminars, workshops or courses

Seeking Feedback

Expansion

Observation

Vision Development

Environmental Structuring

Searching for opportunities
Active Experimentation
Exploring New Strategies

Professional Reading

Research

Stretching Activities
Controlling/Checking
Organising
Structuring Knowledge
Practice & Repetition
Thinking

Generative Learning
Learning from failure

Incidental Learning

Action Learning

Pre-entry experience

Extra-Occupational Transfer

Osmosis

Innate characteristics
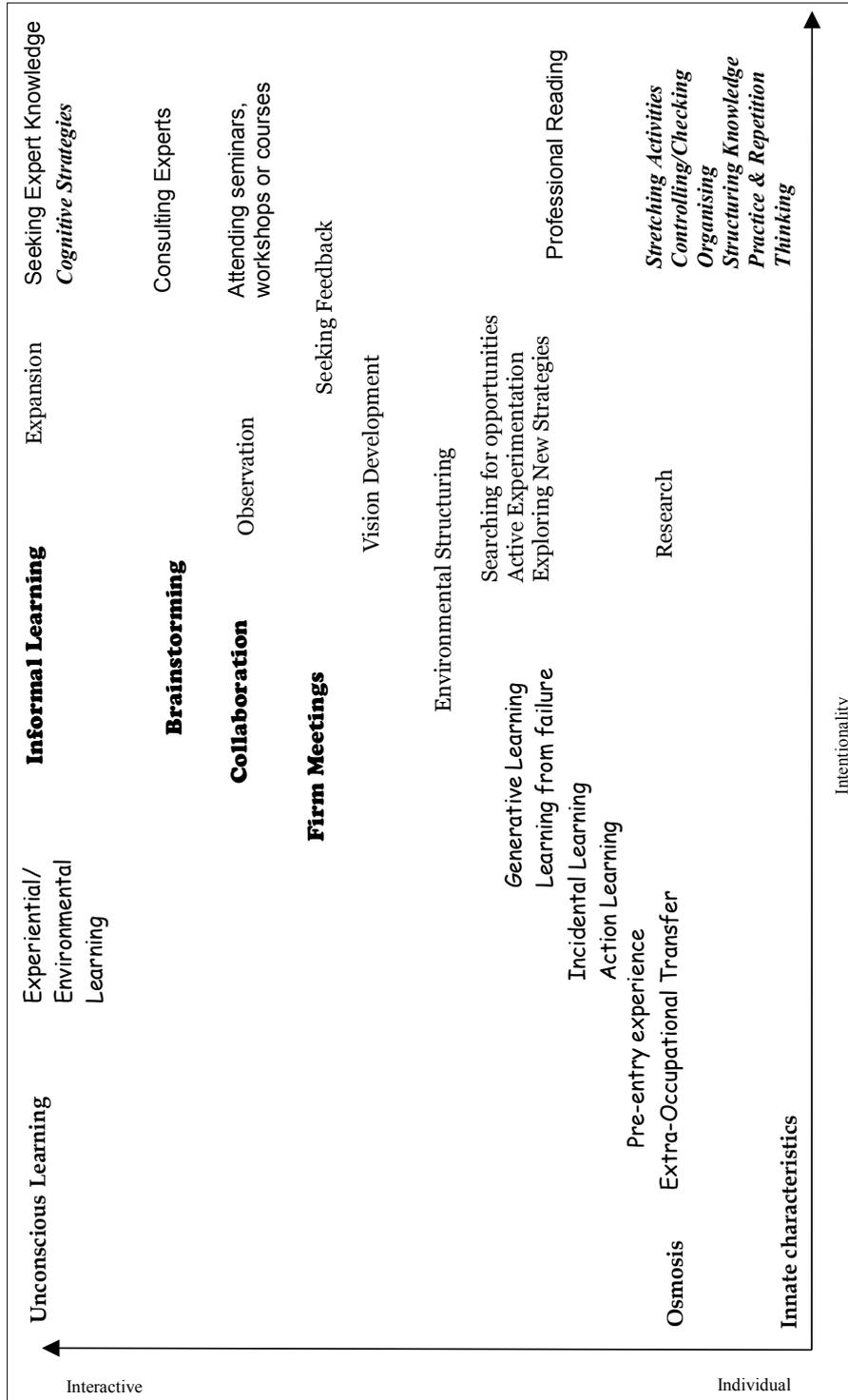
Intentionality

Interactive

Individual

Figure 2 also fits quite well with a social cognitive perspective of self-regulated learning. A social cognitive perspective is distinctive in viewing self-regulation as an interaction of personal, behavioural, and environmental triadic processes (Zimmerman, 2000). This conception of self-regulated learning encompasses the cognitive skills emphasised by metacognitive theorists, but also extends beyond these to include the self-regulation of motivation, the learning environment, and social supports for self-directedness (Zimmerman *et al.*, 1992). According to a social cognitive perspective, the acquisition of a wide range of task competencies emerge in a series of four regulatory skill levels (Zimmerman, 2000):

1   At the *observational level*, learners can induce the major features of the skill or strategy from watching a model learn or perform.

2   An *emulation level* of self-regulatory skill is attained when a learner's behavioural performance approximates the general strategic form of the model. The motoric and social consequences of the observer's use of this skill will determine the motivation to develop the skill further.

3   Attainment of a third, *self-controlled level* of self-regulatory skill occurs when learners master the use of a skill in structured settings outside the presence of models.

4   A *self-regulated level* of task skill is achieved when learners can systematically adapt their performance to changing personal and contextual conditions. The learner can vary the use of task strategies and make adjustments based on outcomes. Learners can choose a strategy and adapt its features with little or no residual dependence on the model.

The source of learning of regulatory skill is primarily social for the first two levels, but at more advanced levels, the locus shifts to self-sources (Zimmerman, 2000). In Figure 2, we can clearly see that learning strategies can be differentiated in terms of level of social interaction. A number of the *Cognitive strategies* (*e.g.*, *controlling/checking*, *stretching activities*, *structuring knowledge*) indicate a high level of self-regulatory skill and so can be classified under the fourth self-regulated level. However, there are strategies in Figure 2, which are high in terms of level of social interaction, but would also be considered to have high levels of regulatory skill involved; the strategies under the category of *Expansion* would be a case in point. It would appear that Zimmerman's social cognitive perspective of self-regulated learning, which was developed within an educational setting, may need to be adapted to include strategies which are high on social interaction and also high on self-regulatory skill. Some of the preferred ways of learning for entrepreneurs in an informal setting are seeking feedback, vision development, environmental structuring and active experimentation (see *expansion* strategies in Figure 1). Hence, the strategies identified in this research suggest that self-regulated learning may need to be conceptualised differently in non-formal or informal learning environments, than it has previously been in educational settings. The present research indicates that the context and the interactions an entrepreneur has with various individuals, groups and organisations are important strategies in the self-regulation of entrepreneurial learning. Theorising about self-regulated learning in informal contexts

must move beyond the individualistic view of cognitive strategies to view the person in context, in line with the theorising of Simons (2000; Simons and Ruijters, 2001) about work-based learning.

Simons (2000) suggested that in many work-based situations, learning is a side-effect of problem solving, working or acting only, and it will appear as experiential or incidental learning. However, although in such contexts, there is no explicit regulation of learning, the learners may be regulating their actions, problem solving or working. Although learning in this context occurs unconsciously (there are no learning goals, learning strategies or testing of learning) and is regulated by the environment, the work environment can be organised in such ways that experiential learning becomes more or less probable. Simons (2000) suggest that the skills learners need in order to be able to do this themselves include personal autonomy and skills and attitudes that relate to working in such a way that experiential learning become probable. These include: getting feedback on one's activities, thinking about actions 'in action', reflection on actions in a more general sense, innovation and experimentation and theory construction or vision development (Simons, 2000). Hence, it would appear that in order to capture the reality of learning in an informal or work-based context, theories of self-regulated learning must move beyond the formal educational model which they have previously adhered to.

Doornbos *et al.* (2004) note in their typology of work-based learning (which includes guided learning, experiential learning and SDL) that there are questions over the appropriateness of guided learning (or instruction) for understanding and modelling work-related learning. Furthermore, they suggest that instead of being explicit, guidance may actually be implicit in the responses of others at work. The results of learning within the entrepreneurial context presented here, suggest that guided learning may actually be a sub-category of self-directed or intentional learning within the SRL continuum. Doornbos *et al.* (2004) also suggest that SDL within the work environment appears to involve the intention to take advantage of those opportunities that present themselves and as a result, exert some control over one's development at work, providing further theoretical support for the second axis in Figure 1, that of the level of interaction. The findings suggest that entrepreneurs, who operate in an entirely autonomous environment, attempt to structure their environment, interactions with others and experiences in order to place themselves in an advantageous position with regard to learning from others successes and failures, as well as their own.

The investigation of self-regulated learning offers a more comprehensive account of learning strategies that may be engaged in, moving beyond the restriction on the cognitive model or the experiential model, and also offers scope for a more comprehensive approach to the study of learning strategies within entrepreneurs. The next stage in research on the topic of entrepreneurial self-regulated learning is to examine potential relationships between self-regulated learning strategies and entrepreneurial knowledge, performance and success. Kraus (2003) has established that self-regulation or reciprocal determinism is evident in the relationship between EO, strategy process characteristics and business performance, and concludes that a comprehensive psychological approach to entrepreneurial performance must incorporate self-regulatory processes. It follows that learning is a process that must occur in order for this feedback or self-regulatory loop to operate. By investigating the self-regulatory learning processes that occur to enable such reciprocal determinism, not only with regard to business performance, but also in relation to other critical contexts from which entrepreneurs

learn, the field can be significantly advanced. A limitation of the present study is that it reports on a relatively small number of cases from a larger study underway. However, it is envisaged that further research and analysis will provide answers to these questions.

A further limitation of this study is that it has not considered the motivational and emotional aspects of self-regulated learning. Although a number of models of self-regulated learning and self-regulation focus on cognition (*e.g.*, Action Theory), there is a growing recognition that motivational and emotional processes play an important role in self-regulation and self-regulated learning (*e.g.*, Boekearts, 1995; Boekearts, 1996; Efklides and Volet, 2005; Järvelä and Volet, 2004). Future research will need to investigate these processes with regard to the role that the play in the self-regulated learning process in an entrepreneurial context.

Béchard and Grégoire (2005) state that the single most important challenge for the future lies in developing a scholarly expertise in the dual fields of entrepreneurship and education. Hisrich (1990) states that one of the roles that organisational psychologists can play in relation to entrepreneurs and intrapreneurs is to help develop university curricula for entrepreneurs and intrapreneurs. Significant improvements in our understanding of entrepreneurship, and more generally of organisations, may come from analysing how entrepreneurs accumulate and update knowledge, *i.e.*, from the study of entrepreneurial learning (Minniti and Bygrave, 2001). However, Warr and Downing (2000) argue that research into learning strategies needs to look beyond the school and college settings which are typically investigated. They suggest that conventional ideas about learning strategies need to be tested under the conditions of everyday adult learning, beyond the academic setting and samples studied to date. The present research focused on the cognitive strategies which entrepreneurs use to self-regulate their learning in the early stages of a new venture. As such, it can be considered to fill the gap with respect to learning strategies within one work-based setting; that of an entrepreneurial start-up venture.

This study focused on the role that both the psychological context and the environmental context play in the management of knowledge acquisition in early-stage entrepreneurs. In sum, this research found that entrepreneurs do indeed self-regulate their learning in the early stage of a new venture. They exhibit a wide array of learning strategies, which can be conceptualised along the dimensions of the level of intentionality of the learning, as well as on the level of interaction with other people and the wider environment. It appears that entrepreneurs strategically position themselves within environments and networks in order to facilitate the learning process, which is an aspect of self-regulated learning not previously addressed from an educational perspective. Such insights into the knowledge acquisition and learning strategies of entrepreneurs can provide scholars, educators and entrepreneurs themselves, with valuable insights into effective ways of learning throughout the entrepreneurial process. Fiet (2007) has already suggested a theoretical link between self-regulated learning and entrepreneurial search and discovery, suggesting that individual volition plays a role in successful discovery. Investigating self-regulated learning along the dual continua suggested in the present research provides an initial corroboration of this link in early-stage entrepreneurs, and indicates that further research is warranted.

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