

TUNING UP THE GLOBAL VALUE CREATION ENGINE: THE ROAD TO EXCELLENCE IN INTERNATIONAL ENTREPRENEURSHIP EDUCATION

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1. INTRODUCTION

Most of us believe that entrepreneurs are special. We do this because both scholars and practitioners tell us so.

Scholars may disagree on the nature of entrepreneurship itself; but they do agree that the results of entrepreneurship are unique and important to economic well-being worldwide. Practitioners likewise. Whether they be policy makers seeking job creation, the popular press which needs an endless supply of biographies and “how-done-it” stories, the beneficiaries of entrepreneurs’ generosity that are constantly wooing these potential sources of large endowments, the celebrity-seeking public who – as with sports and entertainment stars – seeks to venerate entrepreneurs as heroic objects, or entrepreneurs themselves, most of whom do not mind a little veneration; it is also well accepted by each category of practitioners that entrepreneurs are special.

However, here the agreement seems to stop, at least when it comes to one fundamental issue: how entrepreneurs are created. Scholars continue to

International Entrepreneurship

Advances in Entrepreneurship, Firm Emergence and Growth, Volume 8, 185–248

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ISSN: 1074-7540/doi:10.1016/S1074-7540(05)08008-6

argue whether entrepreneurs are born or made (Katz & Shepherd, 2003; Mitchell et al., 2002b), with those of the “born” persuasion pointing to traits (Berlew, 1975; Ibrahim & Soufani, 2002) such as high locus of control (Rotter, 1966) and need for achievement (McClelland, 1965) as reasons that people become entrepreneurs; and those of the “made” persuasion noting that the psychology of the entrepreneur (Brockhaus, 1982; Brockhaus & Horowitz, 1986) or of new venture creation (Shaver & Scott, 1991) involves much more than traits: such things as person, process and choice (p. 23). Practitioners offer up an almost infinite variety of explanations for entrepreneurial success, the prevailing presumption being that because entrepreneurs are special, then the process of becoming one is also special.

Fortunately, mounting evidence is beginning to suggest a new hypothesis ... that while the results of entrepreneurship are indeed important (special, in this parlance), the path to becoming an entrepreneur is not itself special, as previously thought, but is in fact general – rooted in the simple processes of deliberate practice that have been universally associated with creation of the cognitive systems that give rise to excellence in other areas of human endeavor such as sports, games, and the arts (Charness, Krampe, & Mayer, 1996; Ericsson, 1996). And fortunately, the learning models of the deliberate practice school meaningfully situate both trait-statics and process-dynamics within a comprehensive explanation for performance excellence that is rooted in the development (through deliberate practice) of most individuals’ cognitive systems.

Confirmation of this new hypothesis may have far-reaching implications for entrepreneurship internationally. If the creation of entrepreneurs in reality, depends in a nontrivial manner, upon a process that is generally accessible to any individual who is willing to undertake the deliberate practice, necessary to create in themselves the required entrepreneurial cognitions, then we may ultimately discover that the activities based in the “specialness” paradigm that we have intended should stimulate entrepreneurship (such as entrepreneur of the year, the listing of curiosities such as youth v. wealth, etc.), have in fact discouraged it by inadvertently persuading all but the most bold or foolish (in short, all reasonable persons) that entrepreneurship is not for them. Thus, in the same way that monopolies are harmful to the public good because they limit something that is more or less unlimited, so do our beliefs about entrepreneurs effectively limit the amount of entrepreneurship available to us; because they limit a way of thinking that may otherwise be virtually unlimited when viewed in the light of the emerging deliberate practice paradigm. New approaches to the creation of global entrepreneurs are therefore needed, because entrepreneurship as the global value creation

engine, while still running, may in fact be in need of a tune-up, or perhaps even a refile.

Where global entrepreneurship is defined as *the capability to create new and valuable transactions anywhere on the globe* (Mitchell, 2003), then in this chapter we may define global entrepreneurs to be: *those individuals whose capability for creating valuable new transactions crosses geographical, cultural, and economic borders*; and then consider how we might go about a much more systematic process of creating entrepreneurial expertise. In this two-section chapter I therefore attempt to demonstrate that as a global society we have, in certain ways, been wrong in our approach to entrepreneurship education (both informal and formal), and that a course correction (pun intended) is needed. After presenting some brief background, I outline in Section 3 the relationship between education and high-performance to support the argument that entrepreneurs are special, but are not created in the way that is commonly believed: that there is, in actuality, a general process for creating them. In the fourth section of the chapter, I present and discuss the international implications of the emerging “practice school” of entrepreneurship education for reforming the creation of global entrepreneurs.

2. BACKGROUND

High-performance in a variety of forms is an important outcome of business school education (Porter, 1997; Porter & McKibbin, 1988). In this chapter, I define high-performance results (using a comparative approach) to mean: *present results compared to past results, results of Approach A compared to the results of Approach B, and a given set of results compared to relevant goals* (Chrisman, 2001). The achievement of high-performance results as so defined is generally thought to be directly related to education and thinking (Ericsson & Charness, 1994; Glaser, 1984). The nature of the education and thinking involved in producing high-performance entrepreneurial results both domestically and internationally is the focus of analysis in this chapter.

However, by accepting the premise that education and thinking are directly related to the achievement of high-performance entrepreneurial results, we implicitly reject two prevalent notions that bear upon the philosophy of entrepreneurship education adopted herein. The first incommensurable notion is the idea that personal attributes (e.g. achievement motivation, high locus of control, and risk taking propensity) fully determine the extent of economic achievement – especially in the entrepreneurial arena

(e.g. Ibrahim & Soufani, 2002). Proponents of this idea assert some type of exclusivity: that there exists some group of individuals with the so-called “entrepreneurial traits” or “entrepreneurial personalities,” and that as a result, either much of entrepreneurship cannot be taught, and therefore the stock of entrepreneurial talent is limited to a rare minority in any society (leading to the notion that the entrepreneur-creation process should focus on methods of sifting through the population to identify these rare individuals); or that the entrepreneur-creation process should focus on somehow understanding and magnifying entrepreneurial traits and idiosyncrasies.

In this chapter, using recent research on expert performance, I shall instead make the more inclusive argument that high-performance results in global entrepreneurship are more directly related to the cognitive systems of individuals, which are in turn created through deliberate practice behaviors. In the model presented, the influence of personal attributes (such as traits or personality) is suggested to be moderate (affecting some aspects of the propensity to practice) v. being determinative. Thus, the assumption I make in this chapter is that it is deliberate practice as shaped by personal attributes, and the consequent cognitive system of a person, rather than a person’s personal attributes alone that more directly influence the extent of higher-performance entrepreneurial results.

The second incompatible notion is the idea that use of the scientific method to discover, explain, and teach a set of systematic economic high-performance principles and skills is not practical. As a result, there exists a belief that the creation of or the accurate assessment of new economic opportunity (Venkataraman, 1997; Shane & Venkataraman, 2000) is an arcane process that is difficult to understand, and one that only few master. However, as has now been well chronicled e.g. Bernstein (1998), there has been throughout history, a line of demarcation between the phenomena that may acceptably be explained by science, and those which are the province of fate, luck, the gods, etc. For example, prior to the introduction of probability theory, many risks were thought to be unmanageable, which today are simple matters for the actuary and for insurance (life, accident, fire, etc.) (Bernstein, 1998, p. 3). Correspondingly, prior to the occurrence of unacceptable economic shocks (e.g. the stock market crash of 1929, or the automobile quality crisis of the late 1970s and early 1980s) the development and application of systematic standards of auditing (the Accounting Principles Board (APB) and the Financial Accounting Standards Board (FASB)), or quality (e.g. ISO 9000) were thought to be unworkable, if not impossible. In this chapter, I shall demonstrate that recent theory and

empirical results make it possible to further push the line of demarcation from the inexplicable in economic performance, toward the scientifically explicable, thereby enabling a vastly larger proportion of interested individuals to perform at higher economic levels: to become entrepreneurs with global possibilities for creating new value.

Thus, by asserting the possibility of creating effective educational models for the acquisition and enhancement of the high-performance economic expertise that constitutes entrepreneurship, we are explicitly rejecting the prevailing notions and the resulting conclusion that only a minority can achieve high-performance results. For too long, these notions seem to have constituted a tacit morality for our tolerating the exclusion of the majority of the world’s population from the high-performance economic result possibility set. However, if, as I hope to demonstrate, the exclusion of the majority of the world’s population from first-tier economic opportunity rests primarily on the absence of the requisite cognitive system, which system is very likely to be widely transferable if based upon the application of a new branch of entrepreneurship research centered on transaction cognition theory (e.g. Mitchell, 2003), then the educational enterprise that I hope to outline within this chapter, is of monumental import to our collective economic future.

Accordingly, within Section 3 the elements of a conceptual model that relates high-performance entrepreneurial results to education are summarized. Within Section 4 the implications of the model for creating global entrepreneurs are developed: (1) in first-tier economies, (2) in transition and developing economies, (3) using a theoretically justifiable pedagogy, and (4) exploring some of the technological support that is helpful in sustaining and assisting in the effective use of this approach.

3. EDUCATION AND HIGH-PERFORMANCE RESULTS

A key turning point in my own research program as it relates to the education of entrepreneurs occurred on the day that I read Glaser (1984): *Education and thinking*. This new direction was further refined when I added to Glaser’s foundation, the concepts of Ericsson and Charness (1994): *Expert performance: Its structure and acquisition*, and those of Charness et al. (1996): *The role of practice and coaching in entrepreneurial skill domains: An international comparison of life-span chess skill acquisition*. In this first

section of the chapter, in accordance with the use of the integrative approach as the guarantor of knowledge (Mitroff & Turoff, 1973), I shall summarize a conceptual model of the approach used by the deliberate practice school, which I believe can then relate the high-performance economic results of entrepreneurship, to education.

Beginning with the end, so to speak, I should like then to present first the deliberate practice model (Charness et al., 1996), and to explain its component parts, especially noting how both trait-based elements and process dynamics combine to influence entrepreneurial achievement (Section 3.1). Second, I explain how it is possible to combine principles from cognitive psychology and transaction cost economics to identify three essential elements in individuals' entrepreneurial cognitive systems that, through practice, can influence the level of performance in generating entrepreneurial results (Section 3.2). A discussion of the relationship among the parts in the "educational transaction" is the next logical step (Ericsson & Charness, 1994) (Section 3.3). Finally, I conclude the section by discussing the application of the model to education and thinking (Glaser, 1984), and to the pedagogy recommended (Section 3.4).

3.1. The Deliberate Practice Model

Charness et al. (1996) provide a taxonomy that summarizes the factors (and their relationships), which research presently suggests are related to expert performance (Charness et al., 1996, p. 53). Fig. 1 is a reproduction of this summary.¹

Charness et al. constructed and published the taxonomy illustrated in Fig. 1 in Anders Ericsson's (1996) book *The road to excellence: The acquisition of expert performance in the arts and sciences, sports and games*. Accordingly, based upon the context from which it was derived, a strict interpretation of the model might constrain one to conclude that this model may not apply to a more general setting, such as its use in pedagogies that lead to the achievement of high-performance entrepreneurial results. However, as reported later in this chapter, there exist both empirical evidence and evidence from educational practice, which suggest that this model may in fact, be generalizable to the education of global entrepreneurs. The argument supporting this assertion follows.

Essentially, the model illustrated² in Fig. 1 suggests that high-performance results are an outcome of an individual's cognitive system. Further, the model illustrates one of the most robust findings in the literature (Ericsson,

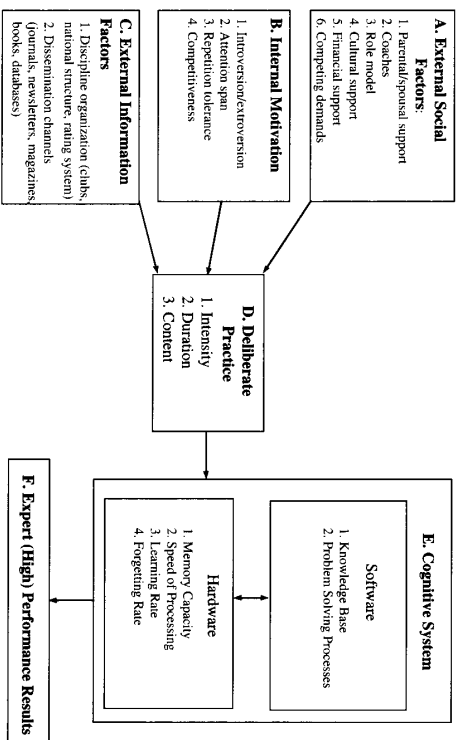


Fig. 1. General Model of Expertise/Skill Acquisition. Source: Adapted from Charness et al. (1996).

Krampe, & Tesch-Romer, 1993): that deliberate practice is the fulcrum upon which the leverage of an expert-level cognitive system depends. Deliberate practice, in turn, is suggested to result from both external and internal (personal attribute) factors, including: external social, internal motivation, and external information factors, each of which is thought to arise from the corresponding sets of sub factors illustrated. Deliberate practice, therefore, is thought to be the key to the attainment in individuals of both elements of a person's cognitive system: the software (knowledge bases and problem-solving processes), and the hardware (memory capacity, speed of processing, learning rate, and forgetting rate). Importantly, the findings summarized in this model suggest that the acquisition of the requisite cognitive system in a domain is limited primarily by the lack of effective deliberate practice. The challenge for educators is to construct a pedagogy that fosters such practice; and accordingly, the "action" (in an educational sense) focuses on boxes A–D. Fig. 1, action that combines both traits (as they affect internal motivation) and the process-dynamics of learning through deliberate practice. Interestingly, one of the findings related to the preeminence of deliberate practice as the key to high-performance, suggests that the role of coaches is critical (Ericsson & Charness, 1994). As my colleagues and I worked

¹ Please note: The figure is slightly adapted from the original figure to: (1) replace item B.3. "compulsivity" with its more accurate and less pejorative substitute "repetition tolerance," (2) align the original title D. "practice" with the literature, thus using the term "deliberate practice," (3) link the original outcome variable "expert performance" to the entrepreneurial outcome variable utilized in this chapter "high performance results," and (4) to designate the subheadings with capital letters A. B. . . , etc. instead of with numbers to avoid later confusion in referencing the figure.

together to operationalize this model in the University of Victoria Entrepreneurship Program, we have discovered that of the three necessary elements of deliberate practice: intensity, duration, and content (Figure 1, box D), the coaches (we as professors) **only** have primary responsibility for the content; and that the students must take primary responsibility for the level of intensity and for the actual duration of their individual practice experiences.

The finding that both student and coach contributions are required, appears to be consistent with suggestions in the literature: that neither fully experiential (Newell & Simon, 1972), nor fully individualized (Gardner, 1983; Gardner, 1993) training can alone explain optimal performance (Ericsson & Charness, 1994: 726-727). To bring about intensity, duration, and content requires a combination of learner and coach contributions. Thus, before proceeding with a discussion of this combination-based educational process, it will first be useful to more explicitly specify the nature of the content to be provided by teacher/ coaches, because this is the element that is most controllable by educators as coaches. In the case of deliberate-practice-based entrepreneurship education, a clear specification of the content consists of using cognition theory adapted explicitly for entrepreneurship education, to identify the essential cognitive systems that, through practice, can influence the extent of high performance entrepreneurial results.

Entrepreneurial cognition theory has led a resurgence in scholarly examination of the “people side” of entrepreneurship (Mitchell, et al., 2002b), and reaches across disciplines using a boundaries-and-exchange approach to enable a jointly distinctive and inclusive domain of entrepreneurial cognition research (Mitchell, Busenitz, Lant, McDougall, Morse, & Smith, 2004). Of particular usefulness in the specification of the essential cognitive content of deliberate-practice-based pedagogies that might be applicable in a global setting, is the newly emerging transaction cognition entrepreneurship theory, because, by deriving the core cognitions necessary for economic activity, it identifies the three sets of entrepreneurial cognitions that cross borders. The essential concepts of this theory—as cognitive content suitable for use in deliberate-practice-based entrepreneurship education, are summarized in Section 3.2.

3.2 Cognitive Content

In this section I introduce Transaction Cognition Theory as the basis for the border-crossing cognitive content in deliberate-practice-based entrepreneurial education, and summarize it in three subsections. Transaction cognition theory has only recently been introduced to explain how to identify the cognitions in transacting systems that lead to high performance entrepreneurial results, i.e. produce new transactions/ units of value (Mitchell, 2001; Mitchell, 2003; Mitchell, Morse, & Sharma, 2003); although some of its component concepts began appearing in the literature during the latter part of the past decade (Mitchell, 1992; Mitchell & Chesteen, 1995; Mitchell & O'Neil, 1998; Mitchell & Seawright, 1995; Mitchell, Smith, Seawright, & Morse, 2000; Morse, Mitchell, Smith, & Seawright, 1999). In the first subsection, I define transaction cognitions as the basis for identifying the necessary deliberate practice content using principles from transaction cost economic theory and cognitive psychology. In the second I define the basic model of the transaction. In the third subsection I illustrate how the concepts from transaction cognition theory are applied to our better understanding the deliberately practisable content of entrepreneurship education.

3.2.1 Transaction Cognitions

Transaction cognition theory (Mitchell, 2001; Mitchell, 2003; Mitchell, 2004; Mitchell et al., 2003) proposes that three sets of cognitions working together are sufficient for an individual to create a transaction as a new unit of economic value, regardless of geographic location:

- Planning cognitions
- Promise cognitions
- Competition cognitions.

Transaction cognitions themselves consist of specialized mental models or scripts (Arthur, 1994; Neisser, 1967; Read, 1987) that guide individuals' responses to three principal sources of market imperfection: bounded rationality (BR), opportunism (O), and specificity (S) (Williamson, 1985). Transaction cost economic theorist Oliver Williamson (1985: 31) argues that contracting processes in the transacting world include: (1) planning, (2) promise, (3) competition, and (4) governance/ hierarchy, depending (respectively in each instance) upon the

presence/ absence combination of the foregoing market attributes (BR, O, & S) (Williamson, 1985), as shown in Table 1.

{Insert Table 1 about here}

This framework suggests three sets of attribute/ process relationships that form the foundation for linking the realities of real-world markets to decision-making cognitions. These three relationships are: (1) between bounded rationality and planning, (2) between opportunism and promise, and (3) between specificity and competition (the relationships in the diagram relating to governance not being germane to this summary).

Interestingly, although these relationships are by nature bi-directional, Williamson utilizes only one direction in his analysis of hierarchies v. markets. That is, he suggests (for example) that the “absence” of bounded rationality in the “presence” of asset specificity and opportunism implies planning; but leaves underutilized the reverse idea that planning should also reduce bounded rationality in situations characterized by those same two conditions (Simon, 1979) (because better or worse planning affects the level of transaction costs that arise from bounded rationality). The same conclusion follows for market imperfections created by opportunism and asset specificity. Opportunism should be affected by promise processes (e.g. trust creation (Barney & Hansen, 1994) among stakeholders (Agle, Mitchell, & Sonnenfeld, 1999; Mitchell, Agle, & Wood, 1997)), and specificity by competition processes (e.g. adopting a low-cost generic strategy (Porter, 1985)). Thus, it follows logically that the cognitions that individuals possess about planning—defined as *the mental models that assist in developing analytical structure to solve previously unstructured market problems*; promise—defined as *mental models that help in promoting trustworthiness in economic relationships* with, for example, stakeholders (Agle et al., 1999; Mitchell et al., 1997); and competition—defined as *mental models that can create sustainable competitive advantage*, are expected to impact transaction costs in the manner illustrated in Table 1, and therefore the likelihood that a transaction—as the basic value-bearing unit in economic activity—will be created.

3.2.2 The Transaction

By definition, a transaction occurs when an individual, the most customary creating entity, creates a “work” (some product or service) and then enters into an exchange relationship with other persons for the sale or acceptance of that work (Gardner, 1993). Transaction cognition theory suggests that, in fact, transaction creators introduce bounded rationality, other persons introduce opportunism, and the work introduces specificity into the transaction (Mitchell, 2001), and these transacting attributes are the sources of transaction costs. Transaction costs are the costs of running the economic system, that to economic systems are what friction is to physical systems (Arrow, 1969: 48; Williamson, 1985: 19). Like friction, transaction costs/ social frictions can either help or hinder transacting. The probability of a transaction’s occurrence is thought to depend upon the level of effective transaction cognitions present in the transaction as illustrated in Figure 2.

{Insert Figure 2 about here}

Entrepreneurship then, can be defined to occur when: *transaction cognitions (mental models/ scripts about planning, promise, and competition) are used to organize exchange relationships (among the individual, the work, and other persons) such that transaction costs caused by the sources of market imperfection (bounded rationality, opportunism, and specificity) are minimized, thus yielding a new unit of value.* Transactions are therefore forthcoming from entrepreneurs within a socioeconomic setting when the social frictions/ transaction costs that prevent transactions are minimized. To restate this colloquially: Entrepreneurs make transactions happen that won’t occur unless someone shows up to reduce the transaction costs that prevent them.

As used in a previous publication to illustrate the point (Mitchell, 2003: 189 – 190) the Microsoft - IBM transaction provides an example that illustrates the relationships diagrammed in Figure 2. As suggested in the definition presented in the preceding paragraph, the requirement for a completed transaction between Microsoft and IBM should be the use of *all three necessary cognitions* (Figure 2-1). A review of the actual circumstances illustrates the role of each cognition set¹.

¹ Interestingly, most events in the transaction creation sequence seem to follow the steps that answer successively the questions: (1) What do I have to offer? (2) Can I make a deal? And (3) Can I produce it? This suggests that the order of cognition use may not, in practice, be planning, promise, competition; but rather competition, promise,

First, for the product envisioned by Microsoft to be competitive, it was necessary that Gates & Co. be permitted to use the early DOS source code—not then owned by Microsoft—that would form the foundation of the product (Figure 2–**C**: the Creating Entity– Others link). Through the use of bargaining/ competitive techniques, this key element of the product was acquired (transaction costs due to specificity were reduced).

Also necessary was the development of a relationship of trust between the IBM executives and Microsoft, which assured IBM that they could rely on the Microsoft team (Figure 2–**B**: the Creating Entity – Work link). Through the use of references and in-person meetings, the promise of reliable production and delivery was communicated such that the possibility of transaction costs from opportunism could be diminished to an acceptable point in the Microsoft - IBM deal, while remaining relatively higher for alternative transactions—once again an action that made transaction completion more likely.

Finally, before the transaction could occur, Bill Gates and associates had to overcome their limited knowledge of the market for their services (Figure 2–**A**: the Work – Others link). Gates and Co. reduced these knowledge limits through a series of events that we can label the planning process, while the limits remained high for potential rivals. This permitted the fledgling Microsoft to minimize transaction costs—an action that made a completed transaction more likely, thus creating sufficient conditions for the Microsoft - IBM transaction to occur—one of the signal high performance economic events in computing history.

The key point to note in this example is that without the requisite planning, promise, and competition cognitions/ scripts, the transaction would likely have failed due to the transaction cost-based social frictions. With a sufficient level of these cognitions/ scripts present, a completed transaction—despite, or perhaps because of the effective use of transaction costs/ social friction²—was the result.

3.2.3 A Theory of Practisable Content

At this point in the summary an important parallel can be introduced. In developing this parallel, I intend to create conceptual linkage in entrepreneurship among the social frictions/ transaction costs, transaction cognitions, and the productive use of friction, to identify the content necessary to support deliberate practice in global entrepreneurship education. Accordingly, a further analysis of social frictions is called for.

Since social friction/ transaction costs can be either relatively higher or lower, and since friction can either help or hinder (Britannica.com, 2001), four general states of transacting can be conceptualized as illustrated in Figure 3.

{Insert Figure 3 about here}

Because the level of friction between two surfaces depends upon the degree of irregularity (Britannica.com, 2001), if we can somehow change the degree of irregularity by altering the nature of the surface, we can effect—or in some cases effectuate (e.g., Sarasvathy, 2001) the proper application of frictions, including social frictions. Transaction cognition theory suggests that increasing the level of effective transaction cognitions, by adding requisite information to transactions (which can be accomplished by increasing the deliberate practice of key cognitive content), ought to increase the expertise needed to effectively alter the nature of the “social surface” to expedite the success of a given transaction (Mitchell, 2001), as illustrated by arrows [1] through [4] in Figure 3. The logic for this proposed relationship is therefore as follows:

Transaction cognitions (P, P, C) → Information Conditions → TC/ Social Friction → Results.

Of course, alterations to information conditions (and thus to the social surface) that make transacting more difficult (where social frictions/ transaction costs *increase*) also occur in the real world. Whereas in the foregoing case, which was recounted in a simplified form (where only the presence or absence of bounded rationality, opportunism, and specificity was allowed as a condition in the analysis); in the real world, these

planning. As such, then, it appears that BR is not the first transaction attribute to be addressed by transaction creators. Instead, it appears to be first specificity, followed by opportunism, and then bounded rationality. Planning is thus made practical because BR has itself been “bounded” in the enactment of the transacting sequence.

² Please see the more detailed discussion and application of social frictions later in this chapter, and a thorough development in Mitchell (2001).

conditions are variables, and are rarely categorical. Thus, a specification of the general case (to deduce the full scope of the practice content in entrepreneurship) requires that such categorical assumptions be relaxed, which suggests that two additional parameters must be included in the model represented in Table 1.

First, continuous variability should be introduced. Thus, rather than showing only “0” or “+,” the table should provide for levels of bounded rationality, opportunism, and specificity that theoretically could range from 0 to +1 (although for operationalization purposes, researchers have nevertheless chosen to set threshold values—subject to internal validity standards—somewhere within the 0 to +1 range to simplify the solution set, and to aid interpretability, e.g. Mitchell & Agle, 1997).

Second, once continuous variability has been introduced, the impact of the new logic must also be taken into account and represented in the model accordingly. For example, in the special case shown in Table 1, the absence of bounded rationality (shown as 0), in the presence of opportunism and specificity (shown as +, +), appears to have led Williamson to the conclusion that planning is the implied contracting process in this special case. Herein, Williamson’s logic has now been extended to comprehend the reciprocity of the relationship between showing a “0” for bounded rationality, and the existence of planning as the implied social contracting process. And accordingly planning cognition levels are expected to be inversely related to bounded rationality levels, which means that planning cognitions are thought to reduce bounded rationality. But this extension causes problems in the categorical set up (where the only values possible are 0 or 1) due to the lack of range—as previously noted—and also, due to the failure to comprehend in the model the social factors that might increase bounded rationality as well as reduce it (or simply not reduce it through their absence e.g., planning cognitions = 0; BR = 1). By extension in the argument, the failure to comprehend in the model the social factors that might increase as well as reduce/ not reduce opportunism or specificity in their function in the analysis would also cause problems in the categorical set up and in the subsequent arguments regarding social surface compatibility as the most likely case for transaction units to occur.

The idea of countervailing cognitions—those that operate to cancel some or possibly all of the effects of planning, promise, and competition cognitions—has recently been suggested (Gurnell, 2000). In analyzing the reasons why some aboriginal peoples in Canada fail to attain economic independence, even while potentially possessing the requisite transaction cognitions, Gurnell suggests the possibility of canceling cognitions as follows:

“But what if the level of requisite cognitions does not actually lie at the zero end of the respective planning, promise, and competition continua; but rather, what if the requisite cognitions have been supplanted in some degree by three debilitating—or (countervailing) —cognitions that are artifacts of the repressive years, which in fact inhibit and constrain the development of the appropriate socio-economic scripts that would allow individuals within aboriginal society to attain a material wealth that is commensurate with their spiritual wealth?” (Gurnell, 2000: 3).

Gurnell goes on to propose and present three substitute cognitions corresponding to planning, promise, and competition cognitions.

More specifically, planning assists in developing analytical structures and courses of action necessary to solve previously unstructured problems. Promise helps in building mutual trust in economic relationships; and competition can create bargaining positions—small or large. Each cognition (set) has an effect upon the transaction costs created by market imperfections, in particular, planning acts on Bounded Rationality (BR); promise acts on Opportunism (O); and competition acts on Specificity (S).

Fatalism v. Planning. Prospective (transactors) may choose to plan a little, or to plan a lot. To completely disregard the validity of planning implies fatalism. Fatalism is the belief that events in life are pre-ordained or that human intervention is powerless to effect change.

Refusal³ v. Promise. One might be involved in high promise transactions or low promise transactions; but to avoid transacting entirely within a group implies that something has happened to that group’s capacity

³ Gurnell originally proposed “betrayal” cognitions. It has later been suggested (Mitchell, 2001) that the label “betrayal” might be too narrow to serve the counterpoint role in the case of promise cognitions (in addition to having a pejorative tone that might compromise its use in a general model). Nevertheless, in searching for a more

for trust (and results in the refusal to transact). That something is typically betrayal or continued exposure to disappointment.

Dependency v. Competition. Presently native society shows an unwillingness to compete (Mitchell, 2001). This unwillingness has likely evolved from prolonged forced dependency upon Indian and Northern Affairs Canada (the federal government), and is manifested in a lack of self-reliance. To further complicate things, societal norms have developed to prevent competition within native society” (Gurnell, 2000: 4).

Gurnell’s insights help to solve the problem of an arbitrarily constrained model, by suggesting the dynamic elements needed. These include fatalism, refusal, and dependency cognitions, which as an initial formulation, move the development of transaction cognition theory forward.

One potential problem with the Gurnell formulation—the conceptualization as categorical variables—needs attention as well. Thus, while Gurnell’s insights assist us in better formulating the general model, their presentation as “either/or” appears to be theoretically unfortunate. As I have considered this parameter of the general model, it seems more logical to me to further suggest that the so-called “substitute” or “canceling” cognitions serve as anchor points on a cognitive continuum.

The implications of this second parameter relaxation are therefore far-reaching, because the resulting model, though parsimonious, is intended to apply to a wide range of socioeconomic phenomena. The general case might then be represented as shown in Table 2, a version of Table 1 revised to represent the relaxed assumptions just introduced into the analysis. As indicated in the table, bounded rationality, opportunism, and specificity are shown to vary along a continuum from zero to one. Further, this variation is shown to effect a continuous range in the implied cognitive process, anchored at one end by the cognitions that counter those at the other. As produced through the foregoing analysis, the focus of deliberate practice to better enable high performance entrepreneurial results should therefore generate learning pedagogies that both develop the planning, promise and competition cognitions that reduce barriers to transacting (transaction costs/ social frictions), while attenuating the fatalism, refusal, and dependency cognitions that increase such barriers.

{Insert Table 2 about here}

3.2.4 Summary

In summary, then, transaction cognition theory uses the 3-element structure of transactions (“works” are generated for “others” by transaction “creators”) as a way to sort and to group the thinking skills (cognitions) required in all economic exchanges. Each element of a transaction introduces a source of value-adding opportunity, which it requires thinking skills/ cognitions (a specific knowledge base and problem solving processes) to utilize. In a transaction, “works” must be competitive, “others” must pay as promised, and transaction “creators” must effectively and efficiently make plans to connect works with customers. Thus, transaction cognition theory suggests that there are three fundamental sets of “transaction cognitions” (counterbalanced by their countervailing counterpart cognitions: dependency, refusal, and fatalism, respectively) that are used to sort and group the thinking skills (deliberate practice content) required in economic exchange are: competition cognitions, promise cognitions, and planning cognitions, respectively. The result of using transaction cognition theory, is that the essential content element in the deliberate practice model has been explicitly specified, thereby enabling me to use this specification to support one of the primary objectives in this chapter: to demonstrate how, with a conceptualization of entrepreneurial content that crosses borders, we can identify a common-content basis for including the majority of the world’s population in entrepreneurship as a reasonable long-term educational and social goal.

fitting label, it seems that Gurnell, in his description cited above, has provided the needed conceptual foundation, if not an adequate label. The suggestion, therefore, has been that that the cognitions that lead a person to “avoid transacting entirely,” are, in fact, simply Refusal cognitions; and I shall refer to them using this label henceforth.

As an important aside, because it is directly applicable to the educational enterprise, it is useful to note how the generalizability of transaction cognition theory assists in a new conceptualization of the educational transaction. Because the general transaction cognition theory model is expected to apply in any socioeconomic setting (Mitchell, 2001), the educational transaction in the university setting can also be conceptualized in its general form. An example of this combination (the production of an educational work of value to others, in the form of the UVic Entrepreneurship Program) is developed in the next section. Because the educational transaction is no different in its form than that of any other transaction, an interpretation of this example in terms of transaction cognition theory—to discern the necessary cognitions⁴ for an effective educational experience—is possible.

3.3 The Educational Transaction

In the educational transaction that normally occurs under present university-level pedagogical assumptions, instructors create pedagogies for students, as illustrated in Figure 4.

{Insert Figure 4 about here}

Figure 5 then illustrates how the transacting sequence in education parallels the general transacting sequence developed and published in Volume 6 of this Series (Mitchell, 2003: 205). After signaling learning intentions—say by registering in the UVic Entrepreneurship Program (which of course require a certain level of competition cognition-based evaluation that this is the set knowledge deliverables desired)—the next question encountered by the transacting student has to do with the crafting of an agreement between teacher and student. The second decision step in transaction cognition theory as represented in Figure 5 duly suggests that the probability of such an agreement depends primarily on the effects of a student’s promise cognitions level, less the effects of the “refusal cognitions.” The importance of this decision step leads me to briefly amplify this point. Since promise cognitions create trust, and refusal cognitions create an affect-based objection-type mentality (Mitchell, 2001), then in the UVic example, a student may decide to register in the five-course (all-or-nothing) Entrepreneurship Program because the trust-creating effects of a strong positive experiences recounted by satisfied former students exceed that student’s worry over having to take the “tough” courses. (Incidentally, in the case of entrepreneurship education, we have observed that even after registration, the level of observed student practice intensity and duration—the student’s responsibility—appears to be directly related to the level of a student’s refusal cognitions⁵.)

⁴ The idea here is that certain enabling cognitions make it possible to acquire further enabling cognitions.

⁵ Since it was noted as a point of educational philosophy at the beginning of this chapter, it should not be lost on the reader that this approach to the education of fledgling entrepreneurs contradicts most of the characteristics-based assumptions about entrepreneurs (i.e. that they have a high locus of control (Berlew, 1975) and high risk taking propensity (Coulton & Udell, 1976), for example). Critics might assert that the encouragement/ self-selecting of individuals who are willing to engage in high intensity and duration of practice behaviors, through the identification and teaching of those individuals who are likely to exhibit low refusal behaviors, will eliminate those with so-called “entrepreneurial potential.” We are not convinced.

Our experience with the very few overly willful and non-compliant (high refusal behavior) students that we have encountered since our Program began, is that a higher proportion of our coaching input appears to be wasted; and that, in addition, as high refusal individuals act out their objections in class it simply detracts from the learning environment for the majority. Whether such individuals are more likely to succeed or not as entrepreneurs is an empirical question, which has been quite thoroughly addressed by scholars who find little explanatory power in the locus of control or risk taking propensity approach to the understanding of individual entrepreneurship (Brockhaus, 1980; Hull, Bosley, & Udell, 1982; Sexton & Bowman-Upton, 1983).

Based upon our understanding of the research record as it presently stands, we see potential in transaction cognition theory to be used as a foundation to educate the majority of individuals in the thinking patterns that are related to high performance results, and see little merit in the search for the personality traits of ideal entrepreneurs. We agree with those who propose the model shown in Figure 1, that there are likely to be aspects of

{Insert Figure 5 about here}

We conceptualize the promise. v. refusal phenomenon as a kind of “elasticity” in a student’s practice curve. Somewhat like economic elasticity, the shape of this practice curve dramatically affects the level of refusal behaviors as a function of level of coaching input, and as a result, affects the expected level of intensity and duration of student practice. Thus in the INelastic case, a hypothetical “unit” of coaching input results in fewer units of refusal (low refusal behaviors); while in the elastic case, that same unit of coaching input produces many more units of refusal⁶. Clearly, the propensity to practice hard and long is much higher where there is an inelastic practice curve.

As a result of these observations, and to assist students with effective self-selection decisions (e.g. whether to register for our ENT Program or not), we have introduced as a self-help mechanism, a Student Preparation Guide, that requires students to prepare a portfolio (Gaglio & Mitchell, 1999; Gaglio, Mitchell, & Vesper, 1998), which develops the promise cognitions necessary for the student and teachers to be able to agree on an exchange with respect to the work (coaching input from the ENT Teaching Team). This agreement is more probable where the likelihood of realizing promised payoffs (e.g., learning for the student, and study diligence for the professor), is signaled by the promise effects of the portfolio project⁷.

Then next, according to step 3 the transacting sequence illustrated in Figure 5, once an agreement has been reached, student and teacher are then able to execute the course syllabus (a learning plan, hopefully consistent with transaction cognition theory). The learning plan, in turn, focuses upon the “content” sub factor in the deliberate practice model (Figure 1: D.3). It is intuitively obvious that highly intense, long duration practice of the irrelevant will be likely to have little effect on the production of high performance behaviors in a field. Thus, transaction cognition-based content is key, is the responsibility of the teacher, and can be deliberately practiced when focused on the transfer of transaction cognitions. But how does the learning plan create this content in the mind of the student? As explained in Volume 6 of this Series (Mitchell, 2003), the content necessary to support the transfer of a high performance cognitive system in an individual involves the creation of a high performance script or knowledge structure. To explain how an entrepreneurial script is created, key elements in the transfer process, specifically the nature and characteristics of high performance scripts (also known as knowledge structures), must be more deeply examined.

Knowledge structures are thought to be a subset of the larger “schema” notion, and have been termed a “schemata.” Glaser writes:

the personality that shape the propensity of an individual to engage in deliberate practice (Charness et al., 1996; Ericsson & Charness, 1994). And it should be obvious that the self-selection processes and low refusal emphasis that we propose (and have found to be effective) do not violate these standards. In short, our internally-gathered data show that the implementation of the pedagogy depends less on personality characteristics, and more upon students’ intent. Metaphorically speaking: To the extent we are teaching those who want “flight training” .v “bird watching” (i.e., those who want to personally be able to think entrepreneurially v. those who simply want to observe entrepreneurship as a phenomenon), the deliberate practice model is effective in building/ enhancing students’ planning, promise and competition cognitions.

⁶ This is a re-specification to correct an error that appeared in Mitchell, 2001.

⁷ The full *Student Preparation Guide*, which follows the format suggested in Figure 1 A. – D., is included as an operationalization example in Appendix 1 in Mitchell 2001, www.ronaldmitchell.org/publications.htm. Illustrated in Figure 1 and discussed more fully in Section 2, boxes A. through C. are twelve items: A(6), B(4), and C(2), which, when combined, are thought to influence positively the intensity, duration, and content of deliberate practice (box D). As students gather into their portfolio, for example, letters of support from significant others (e.g., A1), a description of their training regimen for a sport or artistic pursuit of choice (e.g., B3, B4), or documentation of their pre-Program preparation readings (e.g., C2), they increase trust in themselves, and increased trust is created in the professor, and, in turn, these promise cognition effects make registration in the Entrepreneurship Program more probable.

A schema is conceived of as a modifiable information structure that represents generic concepts stored in memory. Schemata represent . . . interrelationships between objects, situations, events, and sequences of events that normally occur (Glaser, 1984: 100).

The content of schemata is therefore the key element, and Glaser as do others e.g. Read (1987) intimates that this content has two parts: “sequences,” and “norms.” Development of the individual entrepreneurial cognitive sequence has also been described in much more detail elsewhere and includes: searching, screening, planning/ financing, setup, startup, ongoing operations/ growth (Morse and Mitchell 2005; Vesper, 1996). However, the process required for the development of the practice content of script norms still requires further attention, and accordingly is addressed next in Section 1.4.

3.4 Practice Content Norms

Script norms are the compliance standards that are understood by experts to be necessary to the proper performance of tasks within a domain (Read, 1987); and since sequence within a domain is relatively standard, it is the depth and quality of the norms that distinguishes experts from novices. It follows logically that understanding and properly selecting the attributes of the practice content employed when using the deliberate practice model of expertise improvement, is therefore of critical importance in effectively implementing the model, especially since, as educators, the content of our teaching is often its most controllable element. The deliberate practice model (Figure 1) suggests that intense, durable practice of relevant content can create or enhance a person’s cognitive system: the schemata that individuals draw upon to effectuate expert performance. What are these norms?

Schemata theory assumes that there exists structured knowledge for recurrent situations, and that one of its major functions is to permit the interpretation of such situations (Glaser, 1984: 100). Situational interpretation can be thought of as a learning process through which individuals acquire knowledge through an iterative process that consists of interrogation (in-depth examination), instantiation (repetition of same), and falsification (sorting which ideas to keep and which to discard) (1984: 101). Glaser suggests that these thinking skills are best invoked through the development of general intellectual capabilities that he refers to as the “self-regulatory or meta-cognitive capabilities present in mature learners . . . such as knowing what one knows and does not know, predicting the outcome of one’s performance, planning ahead, efficiently apportioning time and cognitive resources, and monitoring and editing one’s efforts to solve a problem or to learn” (1984: 102). Where is such information content to be found? And, how can a metacognition-based teaching help a person to acquire it?

In a 1995 study, Susan Chesteen and I developed a pedagogy for entrepreneurship education, based upon the foregoing theory supplemented with concepts from the experiential learning literature, and tested it in practice. In the paragraphs that follow, I summarize key ideas from the study, and in Appendix 1, provide more detail on the pedagogy (Table A-1), and on the tests performed to validate the underlying assertions. The content of the UVic Entrepreneurship Program is based upon the results of this study.

In this study we explored the idea that, since entrepreneurial expertise is an important factor in successful new venture founding (Mitchell, 1994), and since expertise consists of expert scripts (Leddo & Abelson, 1986; Lord & Kernan, 1987), there ought to be a link between enhancing entrepreneurial scripts and increasing entrepreneurial expertise. The educational intervention (quasi-experimental treatment) in this study was an instructional pedagogy that was expected to improve students’ entrepreneurial expertise by applying the recommendations of expert information theorists for improving script acquisition. Since expert information theory suggests contact with expert scripts as a primary means for acquiring expertise (Glaser, 1984) we used concepts from the simulation and gaming literature (e.g., Petranek, Corey & Black, 1992) to design an experiential pedagogy that featured contact with practicing entrepreneurs, and metacognitive interpretation of this contact (in this case flow-charting student and mentor script sequences and norms) as its primary areas of emphasis⁸.

⁸ Please see Morse and Mitchell, 2005 (forthcoming) for a more recent elaboration of this process-based pedagogy where case-based teaching has been added to the script-transfer process.

The effectiveness of this pedagogy was examined using a model derived from expert information theory (Leddo & Abelson, 1986) and tested using multiple discriminant analysis. As described more fully in Appendix 1, and most comprehensively in the article itself, the experiential pedagogy was shown to enhance novices' propensity to enter the new venture script, beyond that of either non-enhanced novices or experts, while providing a significant improvement in novices' ability to do the things the new venture script requires. This study leads to my noting herein at least three “general” implications of the findings, and then noting three further implications of the findings, which are “specific” to entrepreneurial education.

3.4.1 General Implications of the Study

The first general implication of the findings in this study is to establish links among deliberate practice, script enhancement, and transaction cognition theory. The link between deliberate practice and script/ expertise enhancement is established through confirmation of the relationship between certain deliberate practice activities—in this case direct contact with individuals who are more expert, which students analyzed metacognitively (by being required to “think about their thinking”)—and changes in the subjects' cognitive scripts. The link to transaction cognition theory came in later studies (e.g., Mitchell et al., 2000; Mitchell, Smith, Morse, Seawright, Peredo, & McKenzie, 2002) where it was demonstrated that the existence of the arrangement, willingness and opportunity-ability scripts of entrepreneurs in a variety of countries is consistent with the cognitive sets predicted by of transaction cognition theory (respectively): planning, promise, and competition cognitions (Mitchell, 2003). We can thereby see another reason why transaction cognition theory is appropriate to the task of more clearly specifying the nature of the practice content norms that make up entrepreneurial expertise. The enhancement of planning, promise, and competition cognitions appears to be at the core of improving individuals' entrepreneurial scripts and thereby their expertise.

The second general implication of the findings in this study relates to the pattern based upon the Glaser (1984) approach that is evident in Appendix 1 (Figure A-1). Generally, in the enhancement of expertise, we can expect to see the formation of a new and significantly different cognitive group that is neither expert nor novice. Relative to experts, this group is likely to be underprepared for “doing” and overly eager to “enter” into venturing activity; and as further discussed under specific educational implications that follow, raises the possibility that entrepreneurial education can, in fact, create an overconfidence bias (Busenitz & Barney, 1997; Krueger & Dunning, 1999; Simon, Houghton & Aquino, 2000) in entrepreneurship students.

Thirdly, this study was the first to demonstrate that the “entry” and “doing” dimensions as suggested by Leddo & Abelson (1986) provide a primary basis for distinguishing among four major categories of cognitive engagement in the field of entrepreneurship (although—similar to other findings in the expert information processing literature—there is no reason to suppose that this phenomenon would be limited to the entrepreneurial domain). Thus, if we were to take the results plotted in Figure A-1 as archetypal, we could—by simply matching the dividing lines with the findings, delineate three of the four possibilities suggested by entry/ doing-based theoretical framing. The result is illustrated in Figure 6. As noted, the sample upon which Figure 6 is based is based in the Western USA. However, given the broad geographic dispersal of subsequent findings in multiple countries that include in addition to the USA, Australia, Canada, Chile, China, France, Italy, Japan, Mexico, Russia, and the U.K. (Mitchell & Seawright, 1995; Mitchell, Smith, Seawright, & Morse, 1998; Mitchell et al., 2000, 2002a) it appears to be likely that these archetypes should be useful in mapping the types of entrepreneurial approaches globally (2002a).

{Insert Figure 6 about here}

What are the implications of these findings for deliberate-practice-based entrepreneurship education?

3.4.2 Implications of the Study for Education

The first specific implication for education is that credible evidence suggests that entrepreneurial expertise can be created and/ or enhanced. As described more fully elsewhere (McKenzie, Mitchell, Morse, & Smith, 2001)

the UVic model of entrepreneurship education is based upon this theoretical foundation, and has been recognized in peer-reviewed forums for its successful application at the University of Victoria⁹.

The second specific educational implication may also be derived from the results illustrated in Appendix 1 (Figure A-1). While the experiential and expert enhancement-based pedagogy is successful in the creation of a new group of “enhanced novices,” it certainly does not produce experts in a few months. As a result of this finding, I suggest, and have done so in our entrepreneurship program at the University of Victoria, that the objectives of cognition-based entrepreneurship education be adjusted to portray what is realistic given the empirical data¹⁰. Of course improvements in the pedagogy are still possible, which suggests as a result, ongoing engagement in a process of continuous improvement.

A third educational implication, to which we have already alerted the scholarly community (Mitchell & Chesteen, 1995: 302; Mitchell et al., 2000: 979) is the possibility that entry scripts without doing scripts “may result in venture creation decisions, but these ventures are not likely to last very long (a “rockets to oblivion” phenomenon).” Furthermore, there is a developing literature that considers the effects of overconfidence bias on entrepreneurship (e.g., Busenitz & Barney, 1997; Simon, Houghton & Aquino, 2000). It appears from the foregoing study, that the experiential pedagogy alone is insufficient for accomplishing the entire task of creating entrepreneurial experts⁷, and that the effects of overconfidence bias as it might act to create a mismatch between skill and awareness (e.g., Kruger & Dunning, 1999) should be therefore considered. So, instructors are cautioned to beware of the power of the pedagogy to create eagerness, which can precede preparation by such a wide margin that the danger of “low performance entrepreneurial results,” is higher, to the extent that expertise remains underdeveloped.

3.5 Summary

In this section the objective has been to present, evaluate, and explain the component parts of a conceptual model of expertise acquisition (Charness et al., 1996) that has been adapted as a prototype for use in entrepreneurship education. The relationship among the component parts of the model was next explored. Finally, the section has concluded with a discussion of the application of the model to education and thinking, and to the deliberate-practice-based pedagogy.

The primary idea that drives the construction of the pedagogy described in this section has been that deliberate practice is directly and effectively associated with the development of the cognitive systems (software and hardware) (Figure 1 F.) that lead to high performance entrepreneurial results. It has seemed to me to be only logical that something as general as intense, durable, proper-content-based practice, which has been documented to contribute to excellence in other fields of achievement such as sports, games, and the arts (Ericsson, 1996), would likely work in the field of entrepreneurship. In this section, I have described one application and its testing to illustrate the practicality of the construction and implementation of a pedagogy based in the deliberate practice model for the education of new entrepreneurs. And it has been my hope by documenting this, to begin to demonstrate that through the wide transferability of transaction-cognition-based entrepreneurial expertise that is made possible by a deliberate practice model of entrepreneurship education (rooted for its content in border-crossing entrepreneurship theory), that the exclusion of the majority of the world’s population from the high performance entrepreneurial results possibility set, is not necessarily a permanent condition.

What does this therefore mean for teaching?

⁹ The UVic Entrepreneurship Program won the USASBE Model Undergraduate Entrepreneurship Program Award, presented at the US Association for Small Business and Entrepreneurship Annual Meeting, San Antonio, TX, February 19, 2000. Further, the Program also won the 1999 Academy of Management Entrepreneurship Division “Innovation in Entrepreneurship Pedagogy Award,” presented on August 9th, at the 1999 Annual Meeting held in Chicago.

¹⁰ Thus, for example, the UVic program objective is to prepare individual students so that they can acquire the knowledge and critical thinking skills necessary to enable them to become venturing experts within 5 years of graduation (this being half the time that the conventional wisdom suggests is necessary to acquire an expert knowledge structure (VanLehn, 1989)).

In the next section, the implications of this model for the educational content that can enhance the achievement of high performance entrepreneurial results in both market and transition economies, and for harnessing information technology to support and further enhance these results is discussed.

4. IMPLICATIONS OF THE EDUCATIONAL MODEL FOR INTERNATIONAL ENTREPRENEURSHIP

In this second main section of the chapter, and within its three subsections, I address the implications of a deliberate practice-based educational model of teaching for the achievement of high performance entrepreneurial results in the global setting. I begin (Section 2.1) with a discussion of the present challenges that confront educators within the mainstream business schools in North America, and consider the refinements that are still necessary, in my opinion, for a more optimal path toward high performance entrepreneurial results within Tier 1 economies.

In the second subsection (Section 2.2), I turn to an analysis of the application of the deliberate practice cognitive model within economies that are still in the process of developing toward first tier economies. In Section 2.2 I introduce the idea of a fundamental level of economic literacy, which using transaction cognition theory I define to be: *adequate economic thought based upon the three universal subsets of transacting knowledge—the planning, promise, and competition cognitions necessary for transacting regardless of culture or political system.*

In the and final subsection (Section 2.3) I describe some of the progress that has been made in the construction of expert assistance technology that supports the cognition-based deliberate practice approach to education for high performance results¹¹. The section concludes with observations on the future implied by this educational model.

4.1 Educational Models in Tier 1 Economies

Business schools in the USA have been criticized for insufficient attention to the education of entrepreneurs (Porter & McKibbin, 1988: 66). However, there is little research that differentiates better from worse ways of teaching entrepreneurial skills (Katz, 1991) and little integration of the contributing disciplines to a business school education (Porter, 1997). The transaction cognition model suggests solutions to each of these three problems.

First, for reasons previously identified, it suggests that the substance of an entrepreneurship education should be the development of the planning, promise and competition cognitive scripts of individuals (Mitchell, 2003). Second, it suggests that these cognitive scripts—i.e., expertise in the field of entrepreneurship—can be developed using the deliberate practice-based expertise enhancement methods identified in the elaboration of expert information processing theory as it applies to the acquisition of expert performance within a given domain (Ericsson & Charness, 1994; Glaser, 1984; Mitchell & Chesteen, 1995). Third, transaction cognition theory suggests a likely means for integration across disciplines.

The core idea for value creation that transaction cognition theory proposes is that new value comes from quantity v. price-related dynamics. Whereas price theory in neoclassical economics suggests that prices tend to decrease when quantities increase (an equilibrium-based approach), the disequilibrium-based approach of the Austrian School of economics (e.g., Jacobsen, 1992) suggests that the presence of market imperfections is relatively constant, and that in such circumstances, quantity may increase without downward pressure on prices: thus identifying the source of new value.

¹¹ This software has been cited as a world-wide best practice in distance consulting in: *Potentials and Pitfalls in Using the Internet to Deliver Business Development Services to SMEs*, A Report to the Donor Committee on Small Enterprise Development, Commissioned by the Open Society Institute, October 27, 1998, and presented by Jerome A. Katz, Ph.D., Mary Louise Murray Endowed Professor of Management Saint Louis University, St. Louis, MO USA.) (New Venture Template™ Expert assistance software © Ron K. Mitchell, 1995, cited along with: Multimodal Consulting Services - Ernst & Young's ERNIE, Email Consulting For Everyone– SCORE's Email Service, Multimodal Training for SMEs in Finland – University of Oulu's LearnNet.

Transaction cognition entrepreneurship theory simply identifies the entrepreneurial thinking needed to identify such opportunities and to then recognize, discover, or create (Sarasvathy, Dew, Velamuri, & Venkataraman, 2003) the works for other persons within a marketplace . . . to increase quantity without decreasing prices. This quantity- or unit-based approach is often referred to as “first order” economizing (e.g., Williamson, 1991: 75) in recognition that second-order or price-based decision making is irrelevant where no units—the first order of business—exist.

Thus, for example, a focus group comprised of MBA students selected the following courses taught in a well-recognized MBA program as primarily helping to recognize and develop first-order thinking using the three cognitive models as follows:

- Planning: to identify and apply the first-order planning skills supported by financial and management accounting, managerial economics, applied research and consulting methods, organization design, international business, finance, operations management, cross-national management.
- Promise: to identify and apply the first-order promise skills included with the domains of law, human resource management, marketing, statistics (another course—if offered—would be business and society).
- Competition: to identify and apply the first-order competition skills that are described within the strategy and information technology domains.

Transaction cognition entrepreneurship theory thereby suggests a workable and practical foundation for effective entrepreneurship education: to highlight and integrate the first-order portion of skills taught in the various business disciplines that enable new value creation. This is the essence of the necessary “content” for deliberate practice as suggested by transaction cognition theory.

An explanation of the high degree of success of many of the “pracademic” models of entrepreneurship education (e.g. the Swinburne Model, Vesper & McMullan, 1998) can trace their success to the intuitive application of the foregoing transaction cognition principles to enhance the expert information processing of students. The creation of planning (business plan-based, e.g. (Stevenson et al., 1994)), promise (stakeholder-, trust-based, e.g. (Barney & Hansen, 1994; Mitchell & Agle, 1997)), and competition (entrepreneurial strategy-based, e.g. (Rumelt, 1987)) courses, which combine with experiential (practice e.g., (Ericsson et al., 1993)) and conceptual (script interrogation, instantiation, and falsification, e.g. (Glaser, 1984)) courses taught in an integrated semester-length module along with as much real-world contact with practicing entrepreneurs as possible, is therefore suggested.¹²

It appears likely that if the use of the transaction cognition model as the basis for entrepreneurship education within Tier 1 economies creates increases in the success of individual transactions (whether in jobs or ventures) and of transaction sets (the ventures themselves), then the productivity of an economy must unavoidably be impacted. A populace that is “educated” in the solution of transacting problems that have heretofore resulted in transaction failure due to lack of or misunderstanding of first-order (unit-based) new value creation, could have a material impact upon the wealth creation capacity of an economy. The result in Tier 1 situations would be a high performance economy (Williamson, 1996: 332) where the friction of transaction costs that impedes transactions would be minimized.

¹² At this point the University of Victoria undergraduate program, Victoria, BC, Canada, is the only one known to have been explicitly based upon this suggested model. This 16-month program utilizes two 4-month academic semesters at the beginning and end of the program, coupled with 2 back-to-back work-term semesters (8 months) to provide experience in the middle of the program. Since its implementation began in May 1997, since an operational understanding of relevant constructs is still under development (e.g. this chapter), and since the objective of this particular program is to create the capability to achieve high performance results beginning five years after graduation (assuming work life v. graduate education begins immediately), undertaking a realistic assessment of the impacts of this approach is only beginning to become practical. The Program has, however, been highly rated by student participants, and anecdotal evidence of Program effectiveness abounds.

4.2 Educational Models in Transition Economies

Very early in the presentation of my arguments in this chapter, I suggested that the deliberate practice model of entrepreneurial education that I intended to articulate herein, might provide a means to address the unfortunate and unnecessary exclusion of the majority of the world's population from the high performance entrepreneurial results possibility set. Throughout the preceding section I have been building this argument in support of the idea that, if this exclusion rests primarily on the absence of the requisite cognitive system, and if the requisite system is very likely to be widely transferable when based upon the application of the deliberate practice model, then the educational enterprise implied can be of monumental import to our collective economic future, because while it is counterintuitive, it may ultimately and actually be doable.

This subsection specifically addresses the development of pedagogical content in less-developed economies. Due to the large disparity with Tier 1 economies, we can logically expect that details concerning the application of the deliberate-practice-based model to transition and less-developed economies will be most extensive. Therefore, these details—if only to be discussed once—should rightly be addressed within transition economies as the exemplar case in the “most extensive” context, even though application of certain elements to Tier 1 economies, where relevant, is also intended.

Since 1996, the term “transition economy” has been applied to those economies that have been undergoing a change from a dependency upon central planning to more reliance upon market mechanisms (World Bank, 1996). Included as transition economies have been those in Central and Eastern Europe (CEE), the (relatively) newly independent states of the former Soviet Union (NIS), and economies in East Asia, notably that of the Peoples Republic of China (Peng, 2001: 95). Transition economies are characterized by an economic no-man's land that is no longer fully subject to the protections of planning, but is not yet fully responsive to the motivations of the marketplace. For example according to policy makers who are close to the situation, the fledgling venture capital industry in China faces: an absence of market-based laws and regulations, the lack of effective exit mechanisms, few qualified investors, underdeveloped support institutions (e.g. law firms, management consultants, financial and accounting advisors, market analysts, project evaluators, etc.), a lack of talented managers, and no clear property rights (Fensterstock & Li, 2001). Thus, while the economies within CEE, NIS, and China may be considered to be transition economies, it is also possible that many other less-developed economies would also qualify as “transition” as described herein, and should therefore also be included in the discussion that follows.

Education is likely to play a significant role in the development of solutions to the problems faced by transition economies. But what education? And for whom?

There exists some degree of skepticism that general concepts have a place in such a discussion due to the problem that “every transition economy is different” (Peng, 2001: 106). But as noted earlier in this chapter, there also exists evidence in support of the assertion that there are also regularities—especially cognitive regularities—that do cross borders and can be reliably transferred (Charness et al., 1996; Mitchell et al., 2000) and suggest that the possibility of creating educational models applicable more generally to transition economies is indeed possible. So while I readily acknowledge that vast differences exist among transition economies in such areas as culture, size, former economic traditions, level of preparation for the market—and the list could perhaps go on endlessly—I am also constrained to argue based on both experience and study, that a balanced approach must also allow for the identification and utilization of similarities as well. In actuality, it appears likely that each economy will include manifestations of differences (Mitchell, et al., 2002a) within the systematic structure suggested by transaction cognition theory (Mitchell, 2003; Mitchell et al., 2000). Accordingly, the suggestion of educational models that are, or can be, applicable to transition economies is rooted in the models and ideas previously developed within this chapter.

As one might expect given the argument presented in Section 1, the models that I am suggesting elaborate the deliberate practice model of expertise acquisition, with the content focal point being the enhancement of planning, promise, and competition cognitions, and the corresponding diminishment of fatalism, refusal, and dependency cognitions at multiple levels of analysis (e.g., individuals, firms, economies, societies). I believe that it is unrealistic to expect that such complex problems as those presented within the transition economic context will not require a matching level of depth in theory to respond effectively. In the paragraphs that follow, I hope to further demonstrate how the outlines of the model can be reliably drawn using the previously developed concepts from transaction cognition theory as employed within the deliberate practice model, which, in a measure, provide

the practical path toward creating global entrepreneurs: (as defined earlier herein) those whose capability for adding new valuable transactions crosses geographical, cultural, and economic borders. Consistent with these principles, then, the development of the educational pedagogy for a given economy can be divided into the process (sequence) and the content (norms), but beginning first with content.

4.2.1 Content

As educators, we control or at least strongly influence educational content. As earlier illustrated in Figure 1, the fulcrum of the pedagogy is deliberate practice, which depends upon the quality of practice content for its effectiveness. And as also intimated earlier in the chapter, it is critical to have correct content for deliberate practice to actually produce the increased expertise desired. As the argument has developed herein, it is hopefully becoming clear, that the reason to use transaction cognition theory, deliberate practice, and the script-enhancement educational process suggested, is that through this use we expect to be able to change/ improve the incidence of high performance entrepreneurial results. Transaction cognition theory describes the necessary content, because it provides a comprehensive model that suggests how the border-spanning individual cognition sets can be identified to be planning, promise, and competition cognitions, and then can be related to expertise enhancement and thereby to high performance entrepreneurial results. This theory → practice → enhancement chain thus supports an effective educational pedagogy for creating global entrepreneurs.

The ultimate objective of such an educational pedagogy in the case of transition economies appears to be no different than it is for first-tier economies, and put in the border-crossing terminology of transaction cognition theory it is to enable transaction creators to: (step 1) apply effective levels of transaction cognitions (planning, promise, and competition), to (step 2) organize exchange relationships (among transaction creators, other persons, and the work), to (step 3) minimize the transaction costs created by the sources of market imperfection (bounded rationality, opportunism, specificity), to create new transactions: new units of value. Each element of this objective must be addressed, for the content of a transition economy educational model to be complete. In the following paragraphs, the identification and specification of each of these elements in turn (speaking prospectively) amplifies the steps needed to accurately identify educational content for a given economy.

4.2.1.1 Step 1. Establish effective levels of transaction cognitions. As reported elsewhere (Mitchell, 2001), transaction cognition theory suggests that within each economy/ culture/ setting there is likely to exist sets of planning, promise, and competition cognitions, and fatalism, refusal, and dependency cognitions. As far as I know, an exact catalogue of these cognitions—by economy—has not yet been compiled, and is a subject for extensive future research. Further, within transition economies—despite the observed regularities between groups of transaction creators across countries (Mitchell, et al., 2000)—there are likely, for each country or culture, to be highly specific cognitions, erroneous cognitions, and missing cognitions, each of which bears upon a determination of the necessary content (Mitchell, et al., 2002a). Thus, both a within-groups and a between groups analysis appears to be necessary.

Accordingly, this first part of step 1 in the development of pedagogy for transition economies would be to identify common specific cognitions within an economy group at a given level of analysis—to establish effective levels of transaction cognitions. The methods for this descriptive research are well known, and have been published for both market and transition economies at the individual (Mitchell, 1994) and community levels of analysis (Mitchell & Morse, 2002; Peredo, 2000). Briefly summarized, they include the following subparts: (1) conduct in-depth interviews with a representative group of transaction creators within an economy, who have—as in the case of the individual/ firm cross-level analysis—started at least one business (transaction stream) that is an ongoing entity, (2) conduct textual analysis of the interviews to identify the common elements, (3) construct script cues and test them using a sample¹³ of individuals within the economy. This process should identify the planning, promise, and competition cognitions that are crucial to that economy at the relevant level(s) of analysis. The foregoing steps should be repeated using a representative sample from the non-transaction creators to identify

¹³ In transition economies, and with entrepreneurs in general it has often proven difficult to accomplish strictly random sampling. However, the use of purposeful sampling that is designed to minimize sampling error has been found to be effective (Mitchell et al., 2000).

the common fatalism, refusal, and dependency cognitions. On the basis of this research, the cognitive scripts to be enhanced, and those to be lessened through coaching may be identified.

The next part of step 1 is the establishment of the effective cognition content for transition economy pedagogy would be to conduct a comparative analysis to identify common specific cognitions at a given level of analysis between economy groups and thereby surface erroneous and missing cognitions. Although research in this area is in its infancy, there does exist some empirical evidence upon which to base such an analysis (Mitchell et al., 2000; Mitchell et al., 2001; Morse, Mitchell, Smith, & Seawright, 1999). In this analysis, a careful evaluation of specific within-country common cognitions in comparison to those that are generally found to be efficacious across economies should be conducted. Where certain specific cognitions are found to be missing, they should be considered for addition to pedagogy content. Where specific cognitions are found to be contradictory or erroneous, then further research and analysis should be undertaken to resolve the differences, and to suggest the appropriate additions/ deletions to/ from pedagogy content.

4.2.1.2 Step 2. Organizing exchange relationships (Using The Value Helix). As noted elsewhere (Mitchell, 2003: 205), the process of organizing exchange relationships follows a standard pattern, beginning first with the use of competition cognitions, proceeding then to utilize promise cognitions, and then utilizing planning cognitions; after which the whole process can repeat itself in several iterations, which we can term the “value helix.” Thus, at the individual level of analysis the cross-level venture creation process (actions at the individual level produce outcomes at the firm level of analysis) involves two iterations of the value helix as illustrated in Figure 7¹⁴.

{Insert Figure 7 about here}

Accordingly, the second step in the pedagogy is to organize the teaching/ delivery of the concepts identified in Step 1 using the value helix approach. As previously described in Section 1, there exist proven experiential expert script-based teaching/ learning processes that can assist with the knowledge transfer necessary (e.g., Morse & Mitchell, 2005).

4.2.1.3 Step 3. Utilizing market imperfections to create value. Elsewhere (Mitchell, 2001: 37; Mitchell, 2003: 185), I have presented a highly detailed discussion of how the addition of adequate information to transactions could minimize the social frictions/ transaction costs within a transacting environment to create new units of value. Two of the methods (Figure 3) (Drag to Glide [1], and Slippage to Traction [2]) require the use of BOTH promise and planning cognitions. The other two methods illustrated in Figure 3 (Slippage to Glide [3], and Drag to Traction [4]) require only the employment of planning cognitions. Examples were cited to illustrate these processes at the individual and firm levels of analysis (ibid.).

To support an effective pedagogy for deliberate-practice-based entrepreneurial teaching in transition economies, a third step in the creation of this pedagogy appears to be required because of the uniqueness in institutional development to be expected. Depending upon the levels of analysis that are the point of focus (e.g. cross-level individual/ firm: the creation of new business—individual creates a firm) illustrative case studies from the economy in question that clearly and unambiguously illustrate the four value-adding processes (Figure 3) should be identified and made available to learners. These cases should illustrate how, for example, using transaction cognitions can transform drag into glide¹⁵ within the economy under study, using (in the order suggested in Mitchell 2001: 102-108) competition, promise, and planning cognitions. Once learners master the case details, then transaction cognition theory suggests that the experiential teaching method as described in

¹⁴ In the subsection following, which discusses the application of transaction cognition theory to the creation of expert assistance technology, three iterations of the Value Helix can be seen to provide the underlying order for the assessment of opportunity at the venture/ firm level of analysis.

¹⁵ Mitchell, 2001 devotes extensive attention to the development of both the theoretical and practical application of the concepts behind the four value-adding processes: [1] drag to glide, [2] slippage to traction, [3] slippage to glide, and [4] drag to traction.

Section 1 may productively be utilized to create this portion of the expert knowledge structure (a script for using market imperfections to create value) in the learners.

It should not be lost on the reader that I have deliberately structured this pedagogy creation discussion to encompass use at multiple levels of analysis. The reason for this as it applies to transition economies is that it is often the case that in order to solve the transition problems, the pedagogy may need to be applied simultaneously at multiple levels of analysis. So while the approach to application at the entrepreneurial levels of analysis (individual, firm) might now be evident, I believe that it is worthwhile to explain how I envision that this approach could also be applied at other levels of analysis (e.g. the society level).

Application at the society level of analysis is important to education within transition economies, because many of the obstacles to the creation of wealth exist at that level. Thus, as an example in China's present case, the obstacles to the creation of venture capital markets include: the need for market-based laws and regulations and effective exit mechanisms, few qualified investors, underdeveloped support institutions (e.g. law firms, management consultants, financial and accounting advisors, market analysts, project evaluators, etc.), a lack of trained managers, and no clear property rights (Fensterstock & Li, 2001). In an analysis of transaction cognitions at multiple levels of analysis, I illustrate (Mitchell, 2001: 143) that some of the missing elements on Fensterstock and Li's list involve planning cognitions relating to the productivity levels of the economy (e.g. the lack of trained managers, underdeveloped support institutions), some require promise cognitions relating to the establishment of the institutions of trust within the economy (e.g. laws and regulations, property rights), and others relate to competition cognitions concerning the realization of value (lack of effective exit mechanisms).

Although quite a massive undertaking, it is nevertheless conceivable that the leaders of transition economies or other development agencies might wish to consider the identification and communication of effective societal level transaction cognitions as a necessary prerequisite for the eventual success of a market system tailored to their particular needs. With the advent of mass media, and with the dramatic reduction of telecommunications costs globally, it seems that now is the time to undertake such far-reaching initiatives. I believe that it is now practical to consider that relevant case studies, founded in transaction cognition theory, could be disseminated using appropriate media. The result—as suggested in the discussion of the components of compositional transaction cognition theory models (Mitchell, 2001: 140)—is that each of the less-aggregated levels of transaction analysis could benefit and be supported by the additions to the quality of planning, promise, and competition cognitions at the society level of analysis. The idea of a global human economic literacy project is explored in more detail elsewhere (Mitchell, 2001), and further supports the notion that the deliberate practice model of entrepreneurial education might provide a means to address the needless exclusion of the majority of the world's population from the high performance entrepreneurial results possibility set.

The essential conceptual framework for such initiatives, however, rests upon the foundation illustrated in the general model of expertise/ skill acquisition (Figure 1) presented in Section 1. This leads us next to a discussion of educational process.

4.2.2 Process

The research summarized (Charness, et al., 1996), and represented in the deliberate practice model (Figure 1), suggests each necessary element of the entrepreneurial education process to be derived from it. Because it is the fulcrum of the model, a discussion of deliberate practice, specifically focusing on the “content” element has been featured prominently and first in our discussion. However, in Figure 1, on either side of (i.e., preceding and following) deliberate practice are shown the factors in the literature (Charness, et al., 1996) that are (respectively) the antecedents and consequences of deliberate practice. These antecedents are a key part of the process.

The reader is invited to recall from Figure 1 that there are three sets of preconditions that support deliberate practice: external social factors, internal motivation, and external information factors. It therefore seems logical to focus on these three areas as the starting point for suggestions about a more general educational process that applies to transition economies, and also can be useful to further dimensionalize necessary processes of entrepreneurial education in more developed settings. During my previous discussion of this model (Figure 1) in Section 1, I attempted to differentiate within the three components of deliberate practice that are illustrated within box D. of the diagram (intensity, duration, and content), those components for which the learner is primarily responsible, and those for which the coaches or teachers are responsible: content being suggested as the primary

responsibility of the teacher, and the intensity and duration of practice being the primary responsibility of the learner. Thus, as I now discuss the practice elements of the model in Figure 1, as they relate to educational process within transition economies, I seek to relate the influence of the preconditions suggested in the model (boxes, A. through C.) to the propensity for stimulating intensity and duration in a learner's practice process.

And, as presaged in the introduction to this chapter, my philosophy of education has considerable bearing on the implications that I suggest for educational process. Thus, while the relationships illustrated in the model might be utilized—perhaps intentionally—only descriptively within more mature Tier 1 economies (to explain why high performance results do occur), I take the position that the relationships illustrated in the model are also prescriptive: suggestive of, and pointing to, the steps that are needed to remove the impediments to an effective transition from a planning/ command economy to a market one. So in the following paragraphs, I take the liberty to expand description to suggest instrumental and normative (Donaldson & Preston, 1995) implications as well.

4.2.2.1 External social factors. The deliberate practice general model suggests that “how long and how hard an individual will deliberately practice” is related to the influence of a relevant social community. Significant others (parents/ spouses), coaches, other role models, and the support of an individual's underlying culture, along with financial support and relief from competing time demands, are all thought to influence practice intensity and practice duration. Thus, community-based economic development initiatives appear to be crucial to stimulating the learner-motivated aspects of deliberate practice.

But unfortunately, many such initiatives focus on “outside-in” approaches¹⁶, and as a result miss the opportunities suggested by transaction cognition theory to also build from the inside: mind by mind, transaction by transaction. But to take advantage of these opportunities requires that the social system—e.g., the external social factors in the model—be addressed in a participatory and holistic way, as called for in some of the community economic development initiatives with which I am familiar, e.g. (SFU, 2001). For almost a decade, it has been thought that formulating a social system with the proper channels and support structure for the processes that can lead to more effective entrepreneurial behaviors is essential for newly emerging capitalist countries and for interventionist ones as well, as they seek to revitalize stagnation within their economies (Herbner, 1992). But how is this to be done? What process should be utilized?

Elsewhere (e.g., Mitchell 2001, 2003) I have developed the ideas: (1) that the creation of a transaction as the primary value bearing unit, is the basic building block for the achievement of high performance entrepreneurial results, (2) that successful transacting results from the set of decisions that follow a general cognitive sequence that answers the following questions: Do I (as a potential transaction creator) have something economic to offer to other persons in the marketplace? Can I agree on an exchange with another person? Can I deliver on that promise?”, and (3) that the major barriers hindering people who live in under-performing economies from acquiring an effective level of the competition, promise and planning cognitions they need to achieve economic independence is (a) the absence of the opportunity to encounter and deliberately practice these cognitions, and (b) the presence in those same people of dependency, refusal and fatalism cognitions. Recent research in economically struggling regions in my own province in Canada suggests that these communities are missing crucial cognitions that allow individuals within them to participate in transactions and, hence, contribute to the economic development of the community (Gurnell, 2000; Nyce, 2003). Thus, from the perspective of public policy-makers, the question should be: What cognitions are missing from these communities and why? Then community economic development initiatives should focus on building effective levels of the competition, promise and planning cognitions that are necessary for the successful completion of transactions.

Descriptively, then, we can expect to see within transition economies, that weakness in the community transaction cognition foundation will have a dramatic influence on the external social factors that ought to be supporting the intensity and duration of economic learning experiences. As a result, it should be expected that a variety of misinterpretations of the actual situation due to the “unskilled and unaware” phenomenon (Kruger &

¹⁶ “Governments have concluded that the symptom – the “shortage” of capital – and the cause are one and the same. The solution that follows from the government's perspective is to jump in and provide billions of dollars in subsidies, “strategic investment,” research & development funding, and seed capital through dozens of programs that target everyone from micro-enterprises to huge multinationals . . . (but) there is scant evidence that any of these programs work (Vanagas, 2001).

Dunning, 1999: 1121) will impede the development of high performance results in these economies. Is there a remedy?

Prescriptively, it is clear that leaders in transition economies must sponsor initiatives that result in the development of effective levels of transaction cognitions. Accordingly, I view the Human Economic Literacy initiative (Mitchell, 2001; www.ronaldmitchell.org) to be an essential element in the economic development of transition economies. I therefore expect, for example, that mass communication of the ideas that lead toward increases in the general levels of planning, promise, and competition cognitions, and away from the prevailing influence of fatalism, refusal, and dependency cognitions will have a signal impact upon the practice levels of entrepreneurship (as defined herein), and upon the resulting community cognitive and level of high performance entrepreneurial results. Our taking such actions bears upon my expectations for the factors identified in Figure 1 box A. Parents/ spouses will be more supportive because they have a deeper understanding; coaches will be able to call for and get greater intensity and duration; role models will be more easily identifiable, and their actions more easily interpretable; and general cultural and financial support should increase, while the impact of competing demands for time and attention should diminish.

Idealistic? Yes.

Perfect? No.

Better than many present processes? Perhaps.

Worth trying? I believe so.

But social factors alone do not fully shape the propensity to deliberately practice. The process model also suggests that internal motivation factors will also have an effect.

4.2.2.2 Internal motivation. Earlier in this chapter while setting forth my educational philosophy, I explicitly rejected the idea that personal attributes are determinative in the likely achievement of high performance entrepreneurial results. However, within that discussion I noted an important exception: that the propensity to practice (alluding to the intensity and duration of practice) is nevertheless shaped to some extent by elements of internal motivation. It is clear from the literature that the personal attributes: attention span, repetition tolerance, and competitiveness are thought to be positively related to the intensity and duration of deliberate practice (Charness et al., 1996). And, depending upon the nature of the task, introversion and extroversion (also shown in the diagram) either help or hinder; and in the case of entrepreneurship have been shown to make little difference (Ginn & Sexton, 1990).

It is within the realm of internal motivation that I believe we will find the source of high or low practice refusal behaviors. At present, I am not aware of successful interventions that can assist an individual to change the slope (elasticity) of practice refusal behavior. In the University of Victoria Entrepreneurship Program, we have accommodated ourselves to this reality by implementing student preparation activities that are announced as a prerequisite for success in the program. It has been our experience that students with high refusal behaviors tend to self-select, and remove themselves from the educational pool. Perhaps in future, methodologies will emerge that make this rather Darwinian approach to dealing with internal motivation obsolete. However, until that time, I am persuaded that providing pre-educational self-screening hurdles for learners is a humane process for ensuring that scarce teaching resources are better allocated—especially in transition economies where such resources are scarce.

Thus, transaction cognition theory allows—through the inclusion of internal motivation factors in the model—for the influence of personal attributes in explanations of high performance results. The key distinction, however, is that we should be looking for “practice personalities,” not entrepreneurial personalities—as alluded to in an earlier footnote: looking for those who want “flight training,” and avoiding the “bird watchers.”

2.2.2.3 External information factors. As might be expected in a social cognitive explanation of “persons in a situation” (Fiske & Taylor, 1984: 4), external information factors are thought to have a strong bearing on a person’s cognitions, mediated in the case of model under discussion by the propensity to deliberately practice. I have come to believe that within the set of external information factors we can find the greatest opportunities for the enhancement of high performance economic behaviors. Further, it is my impression that even within the so-called developed Tier 1 economies, the support of external information factors for the deliberate practice of

relevant content is, in fact, underdeveloped. In my conversations with colleagues who work within transition economies, it has been their conclusion that the utilization of up-to-date external information will accelerate their capabilities to catch up and perhaps even surpass the performance of some present leaders in the achievement of high performance entrepreneurial results. Their reasoning goes as follows¹⁷.

In the West, the reported failure rate of new ventures is between 50 and 80% depending upon measures (Kirchhoff & Greene, 1995; Kirchhoff & Phillips, 1989). Contacts with venture capitalists in North America suggest that of the approximately three surviving ventures out of ten, one is a spectacular success, one is moderately successful, and a third is at or near break-even. The remaining seven produce some level of economic loss—even disaster at times. Policy makers within transition economies view this record of results with alarm. They cannot envision nor can they accept that capital formation at the early stages of economic enterprise should be so perilous. Frankly, I agree with them.

Certainly, there are voices within the venture community, which argue philosophically for the status quo: nothing can be done; it's just the way things are, etc. However, as noted earlier in this chapter, the steady progress of scientific inquiry has been to systematically subdue risk (Bernstein, 1998). Science continues to penetrate the domain of philosophy. Addressing problems as diverse as infant mortality, or quality problems in production, the scientific method has contributed systematic analysis for superstition, fatalism, and mediocrity. Thus, it is not surprising to me that policy-makers within transition economies are asking: Why should we accept the capital formation failure rates of the West? Can we not do better than this?

Thus, as new policies are considered within transition economies, the goal is to identify and implement a much higher standard. The essential conceptual framework for such initiatives, however, rests upon the foundation illustrated in the model (Figure 1). Organization of a discipline, and the establishment of effective dissemination channels are suggested to have a direct and positive effect upon deliberate practice, and through such practice upon people's cognitive system and high performance results.

Returning, then, to Figure 1, the focus can now turn to the cognitive system itself: the knowledge base and problem solving processes that together make up the cognitive system upon which a person relies for level of expertise in their performance within a domain. Hopefully it is now clear to the reader that in the case of entrepreneurial performance, this cognitive system is expected to consist of expertise scripts (sequences and norms) that contain the knowledge and problem solving that comes from possession of some level of planning, promise, and competition cognitions. However, a discussion of the cognitive system available to entrepreneurs seems to be somewhat incomplete without a discussion of the possibilities for computer-based tools that might be utilized to further assist entrepreneurs by enhancing the effectiveness of their cognitive system. Here's why.

The foregoing discussion has provided a specification of the content which, when part of a person's cognitive system, acts like software in the human mind. To round out this "software," it only seems sensible for us to attempt to specify, in a discussion of what we might term "entrepreneurial technology," the expertise assistance systems possible that can extend with *computer* software, the *human cognition software* that exists at a given time: to more fully utilize mind-based knowledge and problem solving, by conceptualizing and developing technology-based problem solving processes. Section 2.3 presents this extension and discussion.

4.3 Technology Implications for Teaching Global Entrepreneurship

To begin a discussion of technology that we shall term expert assistance software, we must first develop the necessary definitions and an analytical context within which such a discussion might make sense. Accordingly, I first define some of the necessary terminology, and then proceed in the following two subsections to develop both a conceptual framework and an analytical framework.

Entrepreneurship technology is defined as the application of entrepreneurial science to commercial objectives. One of the means whereby the "entrepreneurial science" of transaction cognition theory—rooted in information processing theory—can be applied to commercial objectives, is through the use of information

¹⁷ Referring to discussions with the individuals who are, for example, writing the new Venture Capital policies for the Central Government in the Peoples Republic of China.

technology. Expert assistance computer software offers one such opportunity. As differentiated from artificial intelligence systems (Chi et al., 1982; Granger, 1980; Marr, 1977), expert assistance systems perform for an individual only the operations that—if performed by that individual—would lessen their level of performance (e.g. long computations, complex comparisons, etc.).

4.3.1 The Conceptual Framework

Based in the functional relationship, $Y = f(x)$, expert assistance entrepreneurial technology relates key planning, promise, and competition independent variables to likely outcomes expressed as a multivariate dependent variable. By minimizing the computational burden, specialized information technology that serves as an expert assistance system can assist in the representation of complex problems in a manner that can enhance expert performance. The analytical framework that forms the foundation of this approach is explained in the first subsection and then this framework is further explained in a second subsection in which the conceptual content is explored in more depth. In this third subsection of Section 2, the analytical framework is linked to transaction cognition theory—specifically to the Value Helix.

4.3.2 The Analytical Framework

The analytical framework that forms the structure upon which the technology is based mirrors the functional relationship in the following paragraphs as follows: (1) the establishment of likely outcomes, (2) the identification of representative independent variables, and (3) the application of an example functional relationship.

4.3.2.1 Establishment of likely outcomes. Experts can recognize “positions” e.g. 50,000 to 100,000 board positions in chess (Chase & Simon, 1972). This recognition invokes use of a schema (VanLehn, 1989), schemata (Glaser, 1984), or expert script (Leddo & Abelson, 1986; Read, 1987). However, if data are not in a recognizable position, experts use of schema is as limited as that of novices (Ericsson & Charness, 1994). Decision-making by experts is thus limited by the existence and extent of an expert schema in a domain. Thus, the first key to the creation of useful expert assistance technology is to establish for business enterprises the equivalent of “board positions,” which can then be related by a decision-maker to any actual set of circumstances that may be encountered. A set of 14 case studies with assigned coordinates on the independent variables serve as these points of comparison.

4.3.2.2 The identification of representative independent variables. Like the forensic evaluation of a partial strand of human DNA that supports, for example, a legal judgment, the assessment of a partial set of venture characteristics such as the following list—as a sample of something akin to a venture’s genetic material—can provide entrepreneurs with the capability to make the business judgments that distinguish viable from less-viable ventures. This set-based approach is known in venturing circles as the “known attributes” approach (Mainprize, et al., 2003: 16-17). These variables include: new combination, product-market match, net buyer benefit, margins, volume, repetitive purchase, long-term need, resource availability, non-imitability, non-substitutability, holdup, slack, uncertainty, ambiguity, and core competence (Mitchell, 1998). All in all, our capability to identify at least fifteen sample attributes of viable ventures suggests the possibility of utilizing *venture viability templates* to identify and observe necessary venture characteristics as independent variables in a functional relationship.

4.3.2.3 Application to the functional relationship. The idea that enables the construction of expert assistance technology for the assessment of economic opportunity relates the decision-making process to the standard functional relationship. Decision-making for the most part, appears to be essentially a binary exercise (e.g. makes sense/ doesn’t; will do it/ won’t; etc.). Binary exercises use base 2 to delimit the consequences of that decision, depending upon the number of independent variables influencing (which have yes-no conditions) that decision. Hence, the number of consequences (conditions on the dependent variable) in a multiple-variable decision situation are an exponential function of the number of independent variables (n) on a base of 2 (e.g. 2^n). Thus, for two independent variables the number of conditions is $2^2 = 4$; for three independent variables the number of conditions is $2^3 = 8$; and for four independent variables the number of conditions is $2^4 = 16$; etc.

Thus, for example, where promise expertise requires that stakeholders be identified and prioritized according to the absence or presence of the independent variables: power, legitimacy and urgency to yield eight

possible outcomes (2^3), e.g., (Mitchell, Agle, & Wood, 1997), the functional relationship $Y = X_1 + X_2 + X_3 + e$ can be more easily and expertly assessed using software that transforms levels on the independent variables into categorical form using an expert assistance algorithm (Agle & Mitchell, 1998). Or where planning expertise is enhanced by the relation of the multiple independent variables of venture performance to multiple venture outcomes e.g. (Mitchell, 1998), or where competition expertise is improved by the capability to assess individual competition scripts (Mitchell, 1994), the expert assessment of the respective functional relationships $Y_m = X_n + e$; and $Y = X_1 + X_2 + X_3 + X_4 + e$ can be enhanced through the use of algorithms created to speed the task, embedded within self-contained software that trains the individual to use it, and contains input and output mechanisms that permit the individual to concentrate on the elements of the problem that are better assessed using the human mind¹⁸ (VanLehn, 1989).

The consequences of decisions based upon multiple independent variables in particular domains are known to experts—and appear to be analogous to “board positions.” As such, these “consequences sets” form part of an expert’s *knowledge structure* or *expert script*. If decision-making comparisons utilizing a mental template such as the one proposed herein (15 variables in a binary decision situation yielding $2^{15} = 32,768$ possible combination conditions) are attempted without the use of known points of reference (board positions) then analysis is effectively disabled, and an individual is relegated to functioning as a novice. Accordingly, a set of case prototypes, based upon actual ventures, is required for comparison purposes. This results in the following functional relationship using the known attributes approach¹⁹:

$$Y_{1-14} = f(\text{attributes})_{1-15}$$

Comparison of results from the known attributes approach (theory-driven system) with results from espoused criteria (practitioner rule-of-thumb) approaches show promise, for example, in the tripling of certain new venture hit rates (Mainprize, Hindle, Smith, & Mitchell, 2002; Mainprize, Hindle, Smith, & Mitchell, 2003).

5. CONCLUDING REMARKS

In the two main sections of this chapter I have attempted to demonstrate that as a global society we have, in certain ways, been wrong in our approach to entrepreneurship education: to identify our mistakes, surface possible solutions, and to some extent assess some practical courses of action. The objective of this chapter has therefore been to use newly emerging entrepreneurship theory, specifically transaction cognition theory as set within the domain of entrepreneurial cognition research, as a foundation with which to explore the relationship between education and the achievement of high performance results in international entrepreneurship, with the intention of improving it—or at least opening to the mind of the reader some previously un- or under-considered avenues for possible new directions for tuning up entrepreneurship education as an engine of global value creation.

In Section 1, through the introduction of a cognitively based General Model of Expertise/ Skill Acquisition (Figure 1), expert performance in entrepreneurship was suggested to come from a highly accessible practice-based learning approach that is general and systematic in nature, rather than from the previously assumed highly exclusive process of entrepreneur-creation that is based in “special” and unsystematic processes. This

¹⁸ Presently software that assists with the utilization of planning scripts (Mitchell, 1995) has been utilized by hundreds of venturers, by the rating panels in several venture capital conferences sponsored by the Wayne Brown Institute, Salt Lake City, Utah, and by new venture teams in two Fortune 500 companies, with a reported positive impact to date in the \$10 million range. Testing of the promise cognition expert assistance system has followed the more traditional research trajectory (Agle, Mitchell, & Sonnenfeld, 1999). Also, the competition cognition expert assistance system has been in use at several universities in North America (Canada, Mexico, USA) for several years, with excellent results (Mitchell et al., 1998).

¹⁹ A sample algorithm has been created and tested in a variety of settings, and it appears later in the discussion; but since this is not the only one possible, since improvements are continual, and since a digression into a discussion of the merits of such mathematical representations is not germane to the topic at hand, I shall simply refer the reader to other literature on this topic (Mitchell, 1995; Mitchell, 1998; Wang, Tang, & Mitchell, 2001; Wang, Mitchell, & Tang, 2003).

argument was offered in service of the idea that the exclusion of the majority of the world's population from the high performance entrepreneurial results possibility set is unnecessarily wasteful of human talent and potential. In Section 1 I intended to demonstrate that the exclusion of the majority of the world's population from first tier economic opportunity rests primarily on the absence of the requisite cognitive systems, that such systems are very likely to be widely transferable if based upon the application of the transaction cognition theory-based deliberate practice model of entrepreneurship education. It is my hope that in this demonstration that the reader has at least become open to the possibility that our collective economic future has the possibility to include a majority v. a minority; that while we have been in some respects mistaken, that doable solutions are available.

In Section 2 the educational model introduced in Section 1 was addressed for both content and process practicality, in both first-tier and transitional/ developing teaching situations, and further, led to the a discussion of the nature and to some extent the role of expert assistance technology in optimizing the effectiveness of individuals' cognitive systems as they impact high performance entrepreneurial results. My intention in Section 2 was to demonstrate to the reader in practical terms, some possible avenues that can be taken whereby we might construct workable action plans to correct our mistakes in the creation of global entrepreneurs. In this task I hope to have also been at least moderately successful.

As an educational philosophy, I have thus argued: (1) that the cognitive systems of individuals are more directly related to the achievement of high performance entrepreneurial results than are their personal attributes, and (2) that recent theory and empirical results make it possible to further push the line of demarcation from the inexplicable in economic performance, toward the scientifically explicable, and therefore from the impossible to the possibly doable. One earlier-suggested line of inquiry, however, remains to be assessed in light of the foregoing arguments.

Earlier in this chapter I suggested that there are activities (based in the "specialness" paradigm) that we have intended should stimulate entrepreneurship, which may in fact have discouraged it. I believe that, in conclusion, it might be useful for us to briefly examine a few examples of such activities with an eye towards: (1) recognition that the things we are doing that we think are "helping" may actually be "hurting," and (2) launching a movement that results in the course corrections needed for entrepreneurship education to fulfill its full potential.

Examples of some activities that continue to backfire on us include:

- (Certain kinds of) veneration or castigation of entrepreneurs: because some types of recognition confirm a self-censoring belief in specialness that is exclusionary,
- The creation of (certain kinds of) entrepreneurship centers: because they prevent the early identification of ill-conceived projects, and the subjection of these projects to market discipline, and fail to enact a bridging and catalytic vision for "entrepreneurial transfer,"
- Teaching entrepreneurship as a (certain kind of) "specialty" program: because it focuses attention away from critical skills and toward less-relevant ones.

5.1 (Certain kinds of) Veneration or Castigation of Entrepreneurs

In a celebrity-driven culture it is easy to see how certain kinds of veneration (or castigation) of, for example, the super-rich or super-successful entrepreneur can backfire. Celebrity by its very nature is exclusive. Veneration-based activities send the sub textual signal that very few individuals can attain this status. It seems to me that only where the recognition operates to reinforce inclusivity, does celebrity-creating veneration serve the cause of increasing overall global value creation. Otherwise, we incur the vast opportunity cost of lost entrepreneurial value due to erroneous self "selection out" of the realm of entrepreneurial possibility: either because we think we cannot attain the heights (veneration), or because we think that we cannot bear to experience the depths (castigation).

Empirical questions, worthy of exploration, are raised by the assertion that exclusivity-creating veneration of entrepreneurs can backfire. For example, it would be useful to know the proportion of individuals who are motivated toward higher levels of results in entrepreneurial performance by assurance of a fair and reasonable chance of success (the deliberate practice paradigm message), and how many are motivated to higher levels of results in entrepreneurial performance by the message that very few, if any, of those who attempt to can actually

reach their goals. It seems logical to expect that accessibility will be shown to be more motivational in the general setting; and I suggest that were such an approach to replace the presently somewhat misguided veneration-based approach, we would see more individuals attempting global entrepreneurial value creation, and more of them succeeding in meeting their entrepreneurial performance goals.

In making the foregoing suggestions, I am not unaware of the potential upset that such a change might invoke in the short term. For example, within the philanthropic community, it is well known that “recognition” is the lubricant that plies money from purses and wallets. Yet the damage from a course correction does not need to be great. Veneration of deliberate practice that has led to the entrepreneurial success of an “ordinary” person, for example, could go some distance toward aligning learning incentives, while preserving philanthropic sentiment.

5.2 The Creation of (certain kinds of) Entrepreneurship Centers

The creation of an entrepreneurship center is not in itself negative in its impact on the number of individuals or teams of individuals who attempt entrepreneurship. However, certain kinds of entrepreneurship centers, especially those that foster low-accountability incubation or funding programs, can backfire, because their fundamental premise is based upon a “hothouse” mentality.

What is meant by a hothouse mentality? This metaphor alludes to the practice of creating an artificial environment in the case of certain delicate flowers (e.g., orchids) that do not grow well in temperate or cooler climates. An extension of the hothouse mentality is the growing of bedding plants in an artificially munificent environment while conditions in the outside environment are inclement, with the objective of setting them out into the regular environment once its prospect for supporting these plants is sufficiently benign.

Where entrepreneurship centers are created to incubate or finance, and shield prospective entrepreneurs and their works from the “others” (the marketplace) in future transactions, it seems to follow logically that the number of transactions (the attainment of value creation through the creation of first-order economizing advantages) will be slowed. The marketplace, by its very nature, is rarely munificent to that business which is poorly conceived and the ineptly implemented. The treatment of individuals or projects as though, by the very declaration of entrepreneurial intention, these are “special,” sets up and inevitable waste of resources . . . in at least two respects. First, resources are wasted in the support of that which the ecology of the market would almost immediately select out. Second, resources are wasted once the full brunt of market force comes to bear upon a congenitally flawed venture, and failure results due to its inability to effectively utilize (what turn out to be) erroneously committed and possibly escalated resources. Thus, another empirical question, that would help to assess the foregoing assertions, might be to track and to determine (at varying levels of protectionism) the longevity of new ventures that are incubated as compared to those that are not.

I suggest that there exists a broader vision for entrepreneurship centers. Earlier in my career, one of my mentors was the late Wayne Brown, who was one of the leaders in the US in suggesting and acting on the idea of “technology transfer” from (in his case) the engineering schools of universities (and later the national labs) into the business sector. In the 1980’s he created a unique kind of entrepreneurship center, one he referred to as an “innovation center,” which tried to enact the entrepreneurship center idea without the above noted disabilities, and *with* technology transfer as an anchor concept. However, given the relative underdevelopment of entrepreneurship research at the time (at least when compared to the development within a university of technology to be transferred) it is little wonder that the “complement” of technology transfer: what I think of as “entrepreneurial transfer,” has not been included within the vision of an optimal entrepreneurship center.

Entrepreneurial transfer as I define it, focuses on the facilitation (through use of the deliberate practice model) of economic literacy; it focuses on the transfer of the special part of entrepreneurship as articulated by transaction cognition theory—the creation of new units of value in a marketplace. A center that includes such a focus could then be extended to serve multiple-bottom-line value creators: artists, engineers, graphics specialties, musicians, playwrights and other writers, etc.; and if coupled with a public policy mandate, could take emerging insights in the creation of value from imperfections beyond the economic (e.g., environmental, social, etc.) (e.g., Cohen & Winn, 2003). Thus, there appears to be an under-enacted vision of the entrepreneurship center as a bridge to the disciplines that depend upon business schools for certain parts of the practical enactment and dissemination of “works.” The idea of entrepreneurial transfer is at the core of such bridging ideas. The idea of

entrepreneurial transfer is, in this respect, catalytic, and supportive of broadening ownership of entrepreneurial cognitions.

5.3 Teaching Entrepreneurship as a (certain kind of) “Specialty” Program

At the point in time when an educator accepts the veracity of the deliberate practice paradigm, that person may actually be adopting a stance toward entrepreneurship education pedagogy that leads away from the treatment of entrepreneurship as a specialty program. I suggest this outcome because the deliberate practice paradigm is rooted in notions of students contributing intensity and duration of practice, and of instructors contributing content: specifically content that is based in transaction cognitions, value creation that is focused on unit increases, and the utilization of the first order economizing aspects of all the business disciplines. Thus, two potential “backfires” must be considered: (1) the need in a specialty program to repeat much of the content within the general business school curriculum, and (2) the isolation of entrepreneurship, which should—under the deliberate practice paradigm—not be isolated, but instead be a part of general business education, but which perversely is bottled up in a specialty program that only few can access.

Thus, the deliberate practice paradigm of entrepreneurship education suggests that entrepreneurship education should be a general part of all b-school education, and that this can be accomplished: (1) with courses that teach students opportunity thinking: how to identify the first order, unit-based, new value through quantity increases-creating elements in all the business disciplines, (2) by specializations that are open to the self-selection of all interested students from disciplines both within and beyond the b-school, and (3) by enacting the complement of the technology transfer that (as discussed in the previous subsection) is termed “entrepreneurship-transfer,” where instead of engineers, etc. transferring technology to business people; the b-school transfers effective entrepreneurial cognitions to transaction creators (thus solving the perennial “mug with no beer problem”²⁰).

Of course the business plan creation courses, as the practice of a skill set to effectively meet institutional expectations in the financing process, would have a necessary place in such curricula; but the “business plan course as integrator” should be properly viewed as a limited-scope version²¹ (i.e. planning cognitions only) of a more comprehensive model that is rooted in the deliberate practice of all three necessary entrepreneurial cognition sets: planning, promise and competition cognitions. What administrators think of, as “the entrepreneurship course,” could thus become the coaching, book-marking, attention-focusing course(s) that could lead any individual who wishes to think entrepreneurially and to feel empowered, to add value locally or globally.

5.4 Creating Global Entrepreneurs

As the reader, you may have noticed the two ways in which I have treated the notion of creating global entrepreneurs: the first, being that individuals can be empowered to act globally, and the second, being that the creation of global entrepreneurs can occur globally. It seems to me that the road to excellence in international entrepreneurship education has room for both travelers. Hopefully in this chapter I have been somewhat persuasive that the process of creation of entrepreneurs who act globally, which is based in transaction cognition theory—a notion of entrepreneurial expertise that crosses geographical, cultural, and economic borders—is a doable one. I hope also that I have been persuasive in conveying the notion that there are many more possible entrepreneurs than

²⁰ The “mug with no beer problem” is a term coined to evoke the notion that while b-school graduates can practice management, they often do not have the training to create the actual technology or special-training-based products (e.g., art, graphics, music, software, writing, etc.) that can be more easily or excellently created by those whose expertise is in such work-creation specialties.

²¹ The present focus on business plan preparation and competition has recently been called into question by a *Burn Your Business Plan* (Gumpert, 2003) approach to entrepreneurial education that suggests “synopsis-based” planning: still an insufficient (in my view) but necessary part of comprehensive entrepreneurial thinking skill. This is especially important since the discussion/ debate stems, I believe, from the increasing realization that business plan preparation for **planning** purposes is quite distinct from business plan preparation for **financing** purposes. The B your B-plan approach deals primarily with the financing aspect.

we had ever supposed: that globally, through the transmission of effective transaction cognitions, and with the right practice, the majority of individuals in our global economy can be entrepreneurial in the Schumpeterian sense (1934) that they create new combinations/ new transactions/ new units of value. I believe that tuning up, or perhaps even refitting entrepreneurship education as an important engine of global value creation, can better enable us to reach new milestones on the road to excellence in international entrepreneurship education.

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APPENDIX 1
Summary of Relevant Concepts and Findings
Mitchell & Chesteen, 1995

Theory and hypothesis

In this chapter, it has been argued that the achievement of high performance results is related to the content of individual knowledge structures/ expert scripts (e.g., level of transaction cognitions), and that entrepreneurial expertise is an important factor in successful new venture founding (e.g., Mitchell, Smith, Seawright, & Morse, 2000). In this study we applied an instructional pedagogy based on Glaser, 1984 to evaluate its efficacy for enhancing entrepreneurial expertise. Thus, the focus is on an instructional pedagogy that improves students' entrepreneurial expertise through the application of the recommendations of expert information theorists regarding script acquisition. Glaser, and other information processing theory scholars suggest that contact with expert scripts is a primary means for acquiring expertise (Glaser, 1984; Norman, Gentner, & Stevens, 1976; Read, 1987). Concepts from the simulation and gaming literature (Petranek et al., 1992) were employed to design the pedagogy that features such contact as its primary emphasis. Table A-1 reproduces the summary table from the published article (Mitchell & Chesteen, 1995: 294), which details the experiential enhancement activities that we utilized as our pedagogy.

{Insert Table A-1 about here}

Information processing theory proposes that an expert may be distinguished from a novice by observing an individual's ability to recognize cues related to an expert "script" (Leddo & Abelson, 1986; Lord & Maher, 1990; Read, 1987). Striking differences between novices and experts have been identified, particularly in the way they store and retrieve information (Fiske, Kinder, & Lartner, 1983; Lurigio & Carroll, 1985). For example, a novice tends to respond to surface features of problems while an expert uses a more fully developed schema, organized around context-relevant scripts (Chi, Glaser, & Rees, 1982). The proposed experiential pedagogy was intended to enhance the expertise of novices such that their expertise levels would become distinct from those of other novices, and approach those of experts. If the experiential pedagogy were to have a significant effect, a distinct level of expertise to be termed "enhanced novice," that is a level between expert and novice, should result. Thus, we expected:

Hypothesis: Differences exist on the expertise levels of experts, novices, and enhanced novices.

Methods

The methods used in our study may be described under the three headings: data gathering, measurement, and data analysis.

Data gathering. The subjects in the experimental study were 174 residents of a large Western U.S. metropolitan area. The data included responses from: (1) a novice group (control), where subjects either had no contact with venturing concepts, or had not personally created new enterprise, (2) an enhanced novice group (treatment), where subjects who have not personally created new enterprise received expertise enhancement course materials and experiences according to the previously described pedagogy, and (3) an expert group of entrepreneurs who qualified under the following definition of "expert." Experts in this study were individuals who had either (1) started a business that has been in existence over two years, or (2) started three or more businesses, at least one of which was a profitable, ongoing entity.

The experiential treatment centered on the *participating* portion of the experiential series described earlier in Table A-1. For two, quarter-long business school courses designed to optimize students' capability to apply the principles and practices of entrepreneurship, we formulated an instructional strategy that incorporated new venture expert scripts. In each class approximately one half of the students were randomly assigned to an "expertise enhancement" group. For these students, the script-based instructional strategy was implemented by utilizing "participating, writing, and debriefing" activities to enhance expertise consistent with the script comparison method suggested by Glaser (1984), and Lord and Kernan (1987). Those students not assigned to the "treatment"

group were encouraged to complete a “control” project the preparation of a business plan or feasibility study. All students participated in a “base” pedagogy consisting of exposure to materials in generally accepted entrepreneurship texts. The undergraduate course was a senior strategy class taught with an entrepreneurial emphasis. The masters’ course was a strategy elective focusing on innovation and entrepreneurship. Students in both courses were primarily business majors.

Measurement. Measurement of the effectiveness of the script-based experiential activity was accomplished using two expert script cue-based scales that were new at the time, but have subsequently been refined e.g. Mitchell et al. (2000, 2002a): (1) the Entry scale containing 15 items, and (2) the Doing scale containing 18 items²².

The items that were created for the Entry scale embody factors strongly associated with willingness to embark upon a new venture (Glade, 1967; Kihlstrom & Laffont, 1979; McClelland, 1968; Sexton & Bowman-Upton, 1985). It is commonly accepted that propensity to take action, moderate risk taking to capture an opportunity, and a continual search for opportunities (v. non-venture application of resources) indicate that an individual is more willing to venture. The items that were created for the Doing scale embody the elements strongly associated with the actual creation of a new venture (Low & MacMillan, 1988; Smilor & Gill, 1986; Stuart & Abetti, 1990; Vesper, 1980). Entrepreneurial experiences such as previous ventures (successes and failures) and the building and utilization of networks, improve an entrepreneur’s ability to start a venture.

The randomized Solomon Four-Group experimental design employed in this study provided a high level of control over threats to internal validity (Fraenkel & Wallen, 1990). In the study approximately half of the individuals in the classes where the enhancement exercises were conducted were randomly selected to receive both a pre-test and a post-test. A t-test was performed using the Entry and Doing scale scores of novices who had no exposure to enhancement activities, and showed no pre-test bias.

Data analysis. In this study it was desirable to analyze the three expertise groups (expert, novice, and enhanced novice) as a dependent variable, using scores drawn from the Doing and Entry scales as independent variables to ascertain whether such discrimination is possible. Thus, Hypothesis 1 was tested using multiple discriminant analysis.

Results. A multiple discriminant analysis (MDA) of the three groups using the two independent variable scales Entry and Doing was conducted. A test of equality of group mean vectors (based on Wilks’ lambda) resulted in a multivariate $F = 20.06$ ($df_1 = 4$, $df_2 = 340$, and $p < 0.0000$). Thus the three groups evidence significantly different levels of expertise. The Entry and Doing scales were also found to be significant predictors of group membership $p < 0.0000$.

The centroids (means) of the three groups are plotted in Figure A-1 as ordered pairs (coordinates) shown near each centroid, so that the separation of groups can be visualized. Isodensity ellipses (circles) that are expected to contain 20 percent of the subjects in each group were plotted with a diameter of each circle computed to be 1.34 units (Watson, 1982). The isodensity circles in Figure A-1 depict the overlaps among the groups. Furthermore,

²² Subsequent theoretical development has resulted in the observation that such scales are formative indicators, v. reflective indicators of the constructs being measured. As a result, the tests of internal validity were not, strictly speaking necessary. Because the individual items are independent pieces of evidence of the scripts they are formative indicators (Pedhazur & Schmelkin, 1991: 54), and are added together to create interval scaled variables (Nunnally, 1978). Formative indicators define, or give rise to, the construct, but are not a reflection of it.

Since each item in a formative scale helps to define the meaning of a construct, affirmative responses to all items are not required from an individual respondent to capture construct meaning. For example, an increase in the pool of people and assets that a respondent controls e.g. (Mitchell et al., 2000: 992 Appendix Item 20), is one indication of mastery of a script relating to arrangements. However, a respondent may have an arrangements script that is based on the masterful use of other resources without reference to changes in their available pool of people and assets. Also, since formative indicators are independent components of a construct, they may not be highly correlated. Consequently, it is inappropriate to expect unidimensionality at the construct level, and it is inappropriate to assess reliability at the item level with Cronbach’s alpha, which is based on inter-item correlation (Howell, 1987: 121).

the total correct classification was found to be 84.2 percent for the novice (control) group, 20.0 percent for the enhanced novices (treatment) group, and 54.7 percent for the expert (entrepreneur) group.

The two discriminant functions substantially increase classification capability since, based on the proportion of each group in the sample, it would be expected that 54.6, 14.4, and 31.0 percent of the subjects (respectively)—only 41.5% of subjects—would be classified correctly. The model improves our capability to distinguish group membership by approximately 160% ($65.9/41.5$) and permits us to improve classification capability over the prior probability by 154%, 139%, and 176% for the novices, enhanced novices, and experts respectively. And, as anticipated, the lower “enhanced novice” classification percentage (20.0%) indicated that the enhanced novices’ scale scores fall somewhere between “expert” and “novice,” demonstrating that members of the treatment group were no longer strictly novices, but were not yet experts. Those subjects who did not receive the experiential pedagogy treatment, and who, instead, prepared a business plan or shorter-version business feasibility study showed no significant change in their levels of expertise.

{Insert Figure A-1 about here}

TABLE 1 - Adapted from Williamson (1985: 31):
Some Attributes of the Contracting Process

Behavioral Assumption:

<i>Bounded Rationality</i>	<i>Opportunism</i>	<i>Asset Specificity</i>	<i>Implied Contracting Process</i>
0	+	+	Planning
+	0	+	Promise
+	+	0	Competition
+	+	+	Governance

0 = absence

+ = presence

TABLE 2: Some Attributes of
The Transaction Cognition Process

<i>Behavioral Assumption</i>				
<i>Bounded Rationality</i>	<i>Opportunism</i>	<i>Specificity</i>		<i>Implied Transaction Cognitive Process</i>
0	1	1		Fatalism ↔ Planning
1	0	1		Refusal ↔ Promise
1	1	0		Dependency ↔ Competition
1	1	1		Governance *

Values 0 to 1 ⇒ absence to level of presence

* By definition already includes a range

TABLE A-1
 Experiential Enhancement Activities

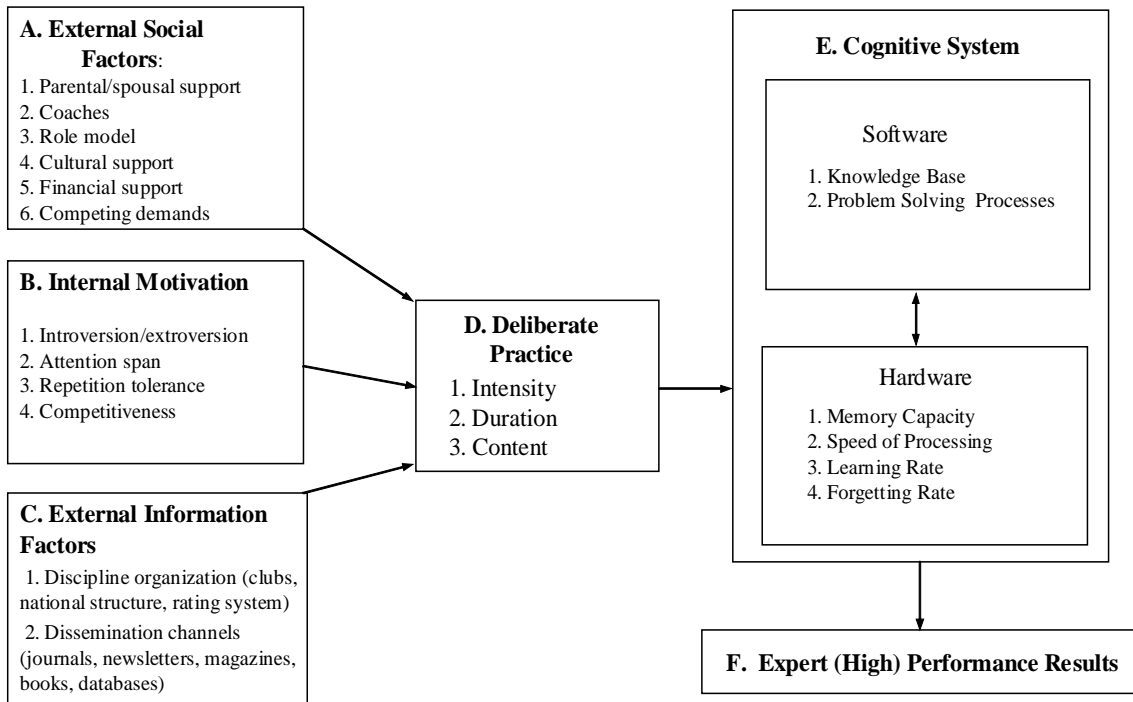
(Glaser 1984)

*(Petranek,
 Corey,
 and Black
 1992)*

	Interrogation	Instantiation	Falsification
Participating	Depth interview with entrepreneur mentor	Hearing the results of other depth interviews	Comparing & contrasting within-group views after mentor interview
Writing	Written description of entrepreneur mentor script: Part II of assigned report	Written description of student novice script based upon individual prior experiences, case studies & lectures from classes: Part I of assigned report	Written comparison analyzing similarities and differences between student novice and entrepreneur mentor scripts
Debriefing	Responding to class questions following group report on depth interviews	Listening to other groups debrief their depth interviews in class	Verbally evaluating the information experienced in class debriefing session

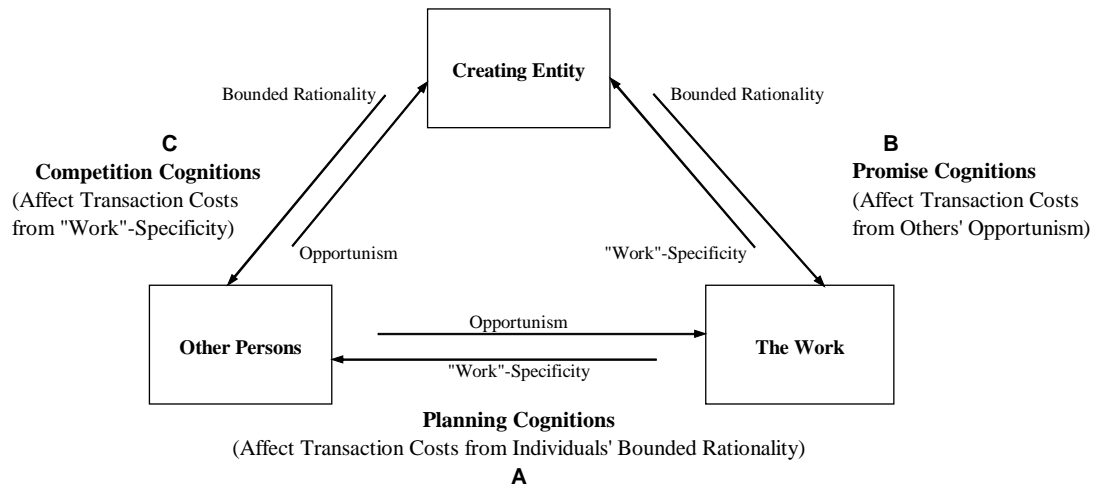
From Mitchell & Chesteen, 1995: 294

FIGURE 1
General Model of Expertise/Skill Acquisition



Adapted from Charness et. al., 1996

FIGURE 2. The Effect of the Specialized Mental Models:
 Planning, Promise, and Competition Cognitions, on Transaction Costs



Based on Gardner (1993); Williamson (1985)

Figure 3: Possible Information-based Approaches to the Utilization of Transaction costs/ social friction in Affecting Transacting

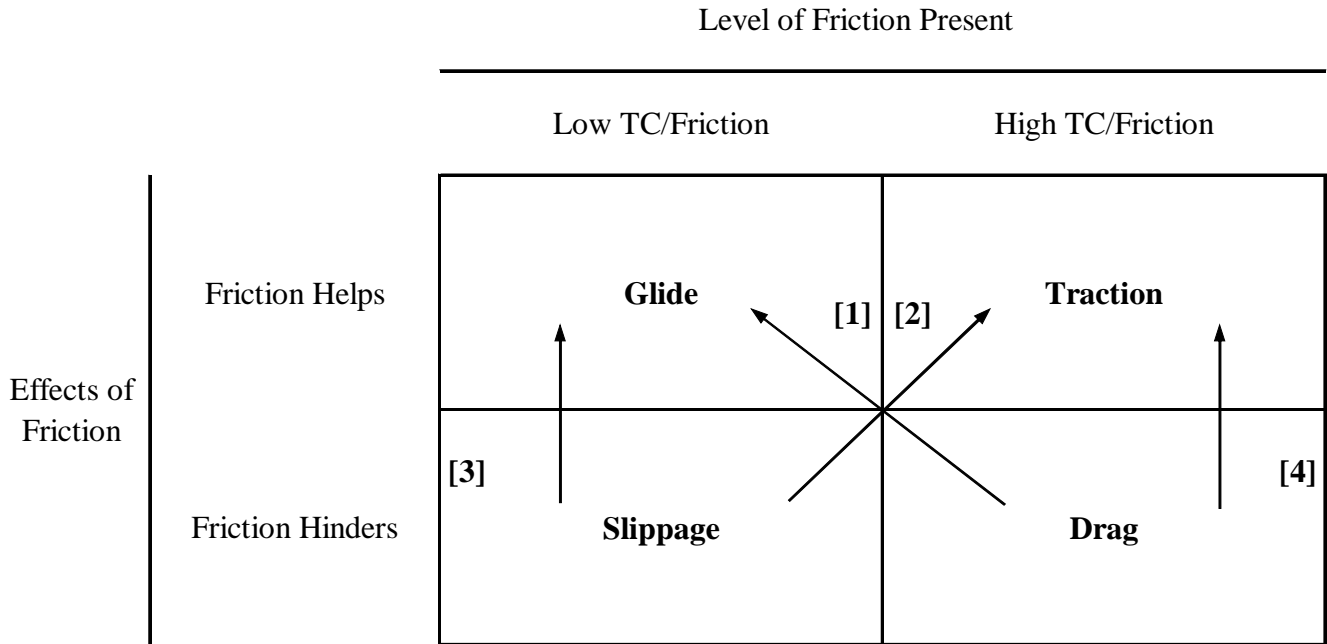


Figure 1 KEY:

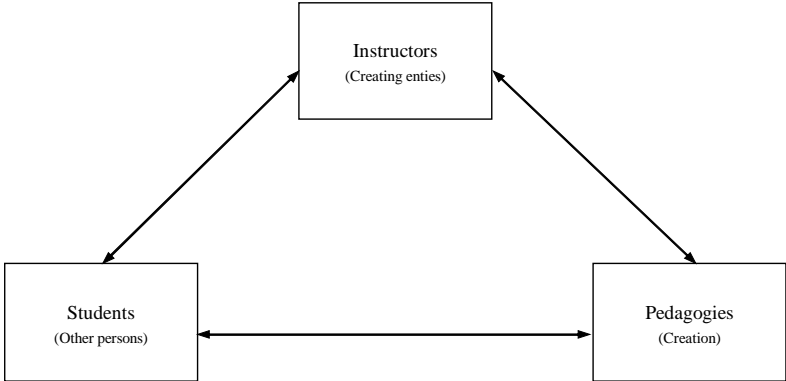
More Comprehensive Transacting Tasks:

1. Glide from Drag
2. Traction from Slippage

More Specialized Transacting Tasks:

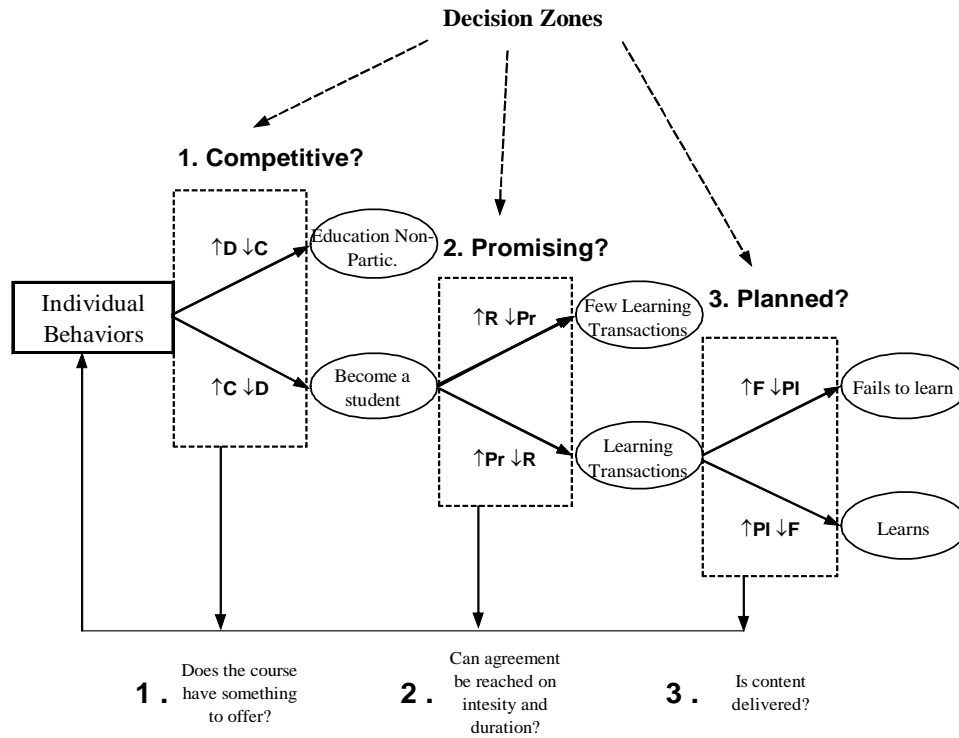
3. Slippage to Glide
4. Drag to Traction

FIGURE 4: The Educational Transaction



Based on Csikszentmihalyi (1988); Gardner (1993)

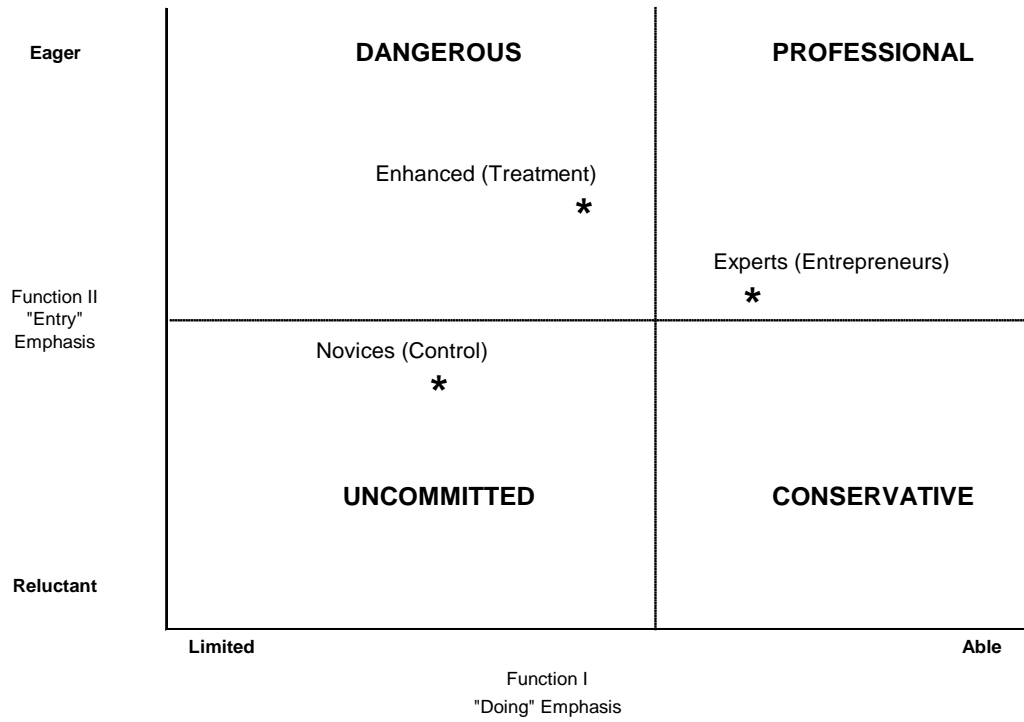
FIGURE 5
A Transaction Cognition Theory Model of
The Educational Transaction



Cognitions:

1. Dependency \leftrightarrow Competition
2. Refusal \leftrightarrow Promise
3. Fatalism \leftrightarrow Planning

FIGURE 6
Cognitive Archetypes Derived from Mitchell & Chesteen, 1995



* = Group centroid

FIGURE 7
Sample Exchange Relationship Organization Process

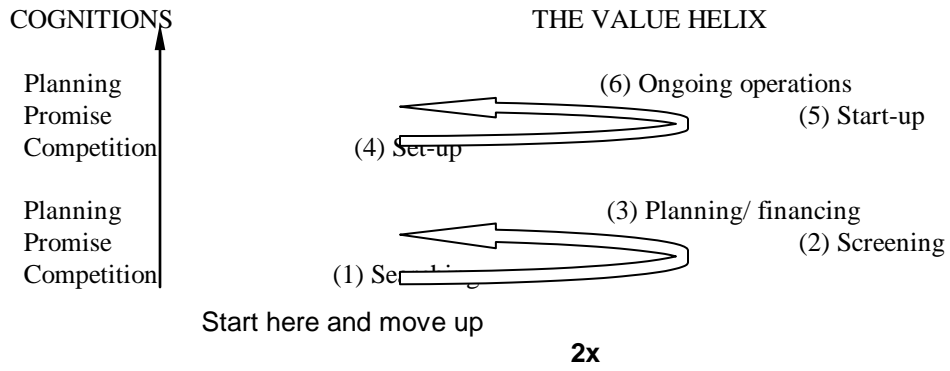


FIGURE A-1
Discriminant Function All Group Scatter plot: 20% Isodensity Circles

