# The Strategic Thinking Skills of Aspiring Business Leaders
# In Greece: An Exploratory Study

*This research explored the use of cognitive processes that are important preconditions to thinking strategically. The purpose of this study was: (a) to assess the use of **strategic thinking skills (STS)—reflection, reframing,** and **systems thinking**—in aspiring Greek business leaders; (b) to examine the impact of moderating environmental and personal characteristics (i.e., gender, age, mother's level of education, father's level of education, and student status) on use of STS of aspiring Greek business leaders; and, (c) to compare the usage of STS skills of Greek business management students to the usage of STS skills of prospective leaders from other countries. This study employed a cross-sectional survey research design with participants comprising of 69 graduate and undergraduate students enrolled in the Department of Business Management at the University of Patras. Quantitative data were collected using the 52-item **Strategic Thinking Questionnaire (STQ)**[©]**Version 8**. The instrument and consent form were translated into Greek, field-tested, then uploaded to Qualtrics™ to be administered electronically. Data were analyzed with descriptive and analysis of variance (ANOVA) statistics with post hoc tests. Among the major findings included: (a) aspiring Greek leaders scored higher in systems thinking (M=3.54) than leaders from Hong Kong (**M=3.53**) and Shanghai (**M=3.01**); (b) aspiring Greek leaders scored higher in **reframing (M=3.66**) than leaders from Turkey (**M=3.63**); (c) three statistically significant differences were found for **reflecting—gender (p=.037), father's educational level (p=.005),** and **student status (p=.002);** (d) four statistically significant differences were found for **reframing—gender (p=.033), age (p=.038), father's educational level (p=.032),** and **student status (p=.003);** and, (e) three statistically significant differences were found for **systems thinking—gender (p=.013), father's educational level (p=.015)** and, **student status (p=.004).***

**Keywords**: cognitive processes, mindset, reflecting, reframing, strategic leadership, systems thinking

## Introduction

*Statement of the Problem*

Leaders in every country are faced with the struggle of demanding forces of an increasingly evolving globalized society coupled by the constraints of local cultural traditions. Moreover, organizational leaders are being challenged by complex technology, shifting populations, and institutional instability—all at an increasingly rapid speed of change. It is generally agreed that leaders who find themselves in such messy, chaotic, complex environments fail for a variety of reasons (Pisapia 2009).

One reason that many of these leaders fail is that they have only been trained in and rely upon a *linear thinking mindset* that does not work in situations

characterized by ambiguity and complexity. Another reason for failure is that these leaders are unable to recognize and identify critical societal and institutional forces impacting their environment; and, thus they are not able to react nor are they able to connect their organizations to the current major themes associated with success. Third, unsuccessful leaders' concepts of change are also linear. Therefore, they overuse quantifiable parameters in the change process and seek to rationally plan their way to success. Finally, unsuccessful leaders do not see their organizations as dependent upon the actions and views of other organizations and individuals. Thus, by not thinking systemically, they are unable to make the connection with the critical forces along their leadership journeys, thus causing them to be ineffective.
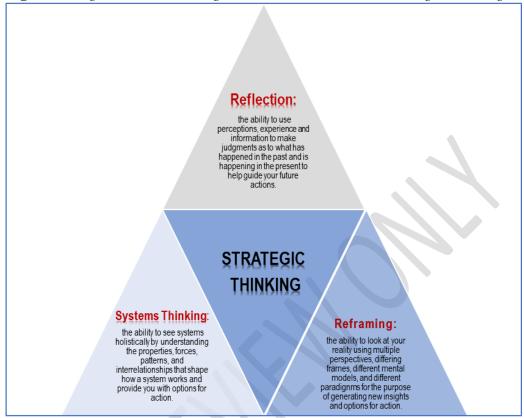
The traditional models of leadership no longer seem appropriate nor adequate to create durable and lasting change. Today's leaders are surrounded by paradoxes: *change* versus *stability*; *linear thinking* versus *nonlinear thinking*; *localism* versus *globalism*. It is natural that some leaders are better than other leaders in understanding, interpreting and leading in these multi-polar, *messy* environments. Pisapia suggests that these leaders are more successful, because they have adopted a strategic mindset to make sense of complexities facing the organization by identifying and applying non-linear change opportunities. Dweck (2006) refers to this type of mindset as a growth mindset. These are the leaders that will, not only survive, but will thrive in a competitive environment.

In the management literature, it is commonly agreed that the ability to think strategically distinguishes effective leaders from ineffective leaders. Chilcoat (1995), for example, suggests that effective leaders demonstrate more complex mental processes than ineffective leaders. Moreover, Leithwood, Jantzi, and Steinbach (1999) believe that efforts to improve the effectiveness of educational leaders may be more productive if more consideration were given to improve the quality of thinking and problem solving rather than simply focusing on actions or behaviors. Separate studies on leadership all showed that the number one most valued skill today in leaders is strategic thinking. However, recent data has revealed that only 23% of United States executives are strong in strategic thinking (Bonn 2001, Liedtka 1990).

*Strategic Thinking Framework*

In *Developing the Leader's Strategic Mindset: Establishing the Measures*, Pisapia, Reyes-Guerra, and Coukos-Semmel (2005) identify three cognitive processes (*systems thinking*, *reflecting*, and *reframing*) that are important preconditions to thinking strategically. See Figure 1. This study was constructed around this framework for strategic thinking developed by Pisapia and his colleagues. It is comprised of powerful cognitive tools, or skills, that enables individuals to make sense of a complex world and can transform the way in which they think, behave, and interact with others. These are the same skills that help to inform and support corporate staffs and military intelligence units in accomplishing strategic choice and tactical execution.

1
2 **Figure 1.** *Cognitive Skills Strategic Leaders Use to Master Strategic Thinking*



**Reflection:**
the ability to use perceptions, experience and information to make judgments as to what has happened in the past and is happening in the present to help guide your future actions.

**STRATEGIC THINKING**

**Systems Thinking:**
the ability to see systems holistically by understanding the properties, forces, patterns, and interrelationships that shape how a system works and provide you with options for action.

**Reframing:**
the ability to look at your reality using multiple perspectives, differing frames, different mental models, and different paradignms for the purpose of generating new insights and options for action.

3
4
5   When applied correctly, these mental tools (i.e., abilities, skills) enable
6   individuals to think strategically and opportunistically; therefore, gaining
7   advantage and becoming more successful leaders. Each of these skills are
8   described in the paragraphs that follow.
9       *Reflection* is a skill—a skill that can and should be taught to assist individuals
10  in gaining insight and perspective on past behaviors and performance. If used to its
11  fullest potential, the art of reflection may change the manner which information is
12  taken in and processed and how judgments are made. Reflection aids in reviewing
13  past decisions, and brainstorming scenarios with possible alternate solutions, thus
14  building a bank of effective behaviors and actions for future use. Ultimately, in
15  turn, these actions and behaviors will guide future actions (King & Kitchner 1994,
16  Lynch & Wocott 2001, Pisapia 2011).
17      *Reframing* is a cognitive function, or skill, that can be taught, and one that an
18  individual can learn and become quite adept at using. Cognitive reframing or
19  cognitive restructuring is the ability to put a new frame (or lens, perspective, or
20  viewpoint) around an old idea or thought process. It is essentially a paradigm shift
21  and offers an individual the opportunity to view problems and questions in a new
22  way which may produce new and unique solutions (Bolman & Deal 1994, Morgan
23  1987).

1    And, *systems thinking* is the ability to view organizations in a holistic manner.
2    It is the skill used to collect and think through and beyond information using the
3    understanding of systems dynamics. Having the ability to think systemically can
4    mean the difference between success and failure for executive leaders, managers,
5    and students. Modern systems thinkers recognize that it is impractical to isolate
6    the organization from its environment. A major component of systems thinking is
7    being aware and looking for connections in the system (Beckhard & Pritchard
8    1992). It is very important to see and comprehend the ways that changes in one
9    part of a system might affect, and be affected by, other parts of the system.

10
11   *Significance of the Study*
12
13   When applied, these cognitive processes should aid in creating a strategic
14   mindset that helps one make sense of the complexities facing the organization. The
15   key to much of the success or failure of strategic actions, regardless of the
16   organizational context, is the *mindset* of the leader (Dweck 2006). The strategic
17   mindset enables the leader to identify, predict, respond, and adapt to non-linear
18   change opportunities and challenges—in a sense—*strategic opportunism.* The
19   leader will always be prepared to act when opportunities arise.
20   A successful, effective and efficient leader must think strategically to create a
21   competitive advantage when faced with the dynamic environmental changes
22   brought about by external forces. Strategic thinking can be used in any
23   organization seeking to acquire and gain a competitive advantage or edge. "With a
24   focus on improvement, often through creativity and innovation, strategic thinking
25   builds a vision, for an organization's future prior to the linear process of
26   developing a strategic plan." (Haycock et al. 2012 p. 1).
27   Results of this current study may be useful for the development and
28   identification of executive talent. From an organizational point of view, identifying
29   and assessing strategic thinking skills in individuals can provide another tool to
30   use in considering who gets selected and placed on the fast-track to executive
31   leadership. From the participant point of view, focusing on usage level of the skills
32   associated with strategic thinking will provide the individual with necessary
33   feedback for continuous development on an important set of conceptual skills.

34
35   *Purpose of the Study*
36
37   This paper explores the use of cognitive processes that are important
38   preconditions to thinking strategically. The purpose of this study was three-fold:
39   (a) to assess the use of strategic thinking skills (STS)—*reflection, reframing*, and
40   *systems thinking*—in prospective Greek business leaders; (b) to examine the
41   impact of moderating environmental and personal characteristics (i.e., gender, age,
42   mother's level of education, father's level of education, and student status) on
43   level of use of STS of prospective Greek business leaders; and, (c) to compare the
44   use of STS of prospective Greek business management students to the use of STS
45   skills of leaders and prospective leaders from other countries.

*Research Questions*

This study was guided by the following three research questions:

$Q_1$: How do students enrolled in the Department of Business Management at the University of Patras, Greece use strategic thinking skills (STS) – overall STS, and individual processes of reflecting, reframing, and systems thinking?

$Q_2$: How do environmental and personal characteristics, such as age, gender, parents' level of education, and student status affect the use of strategic thinking skills (overall STS, and the individual processes of *reflecting*, *reframing*, and *systems thinking*)? And,

$Q_3$: How does the use of STS of students enrolled in the Department of Business Management at the University of Patras, Greece compare to the use of STS of individuals from other developed countries (i.e., Borneo, Croatia, Hong Kong, Kuala Lampur, Malaysia, Shanghai, Turkey, and the United States)?

**Literature Review**

This section begins with a brief investigation into the origin of the word *strategy* and the history of *military strategic thinking* to enlighten how the concept of strategy emerged from ancient warfare to modern military warfare and how the principles of *business strategic thinking* began to form and shape in the minds of great theorists and business practitioners. Next, *strategic thinking skills* are defined in the context of past and modern successful leaders by identifying the essential cognitive processes that are necessary for effective strategic thinking in a modern, global competitive environment. Findings from empirical research studies are presented to support the Strategic Thinking Framework previously described. Finally, an instrument for measuring the cognitive processes of *reflecting*, *reframing*, and *systems thinking* in prospective and current leaders is described as a valuable assessment tool.

*Strategy*

*Strategy* is a concept with military roots. The word στρατηγειο (*strategia),* meaning "office of the general, command, or generalship", in turn from στρατηγικη' (*strategiké)*, meaning "the art or skills of the general", are found in Greek ancient times dating from at least the second century A.D. (Heuser 2010 p. 4). Not to oversimplify the definition, but the goal of strategy is to gain advantage. Being the proud *owner* of advantage simply means that your position has something—be it benefits, profit, or a gain of something—that your opponent is lacking. Many ancient and modern strategists have attempted to epitomize a successful strategy in a set of principles.

1 *The Dawn of Strategic Thinking*
2
3     The principles of military strategy emerged at least as far back as 500 B.C. in
4 the works of Sun Tzu—*The Art of War*—and in 300 B.C. with Alexander the
5 Great's military strategy and tactics. The dawn of the modern era of strategic
6 thinking is marked by the rise of Napoleon Bonaparte. During the Napoleonic Era,
7 all the elements for a military strategic revolution were present: new thinking, new
8 technology, and increasing population. Napoleon describes his strategic thinking
9 beliefs in a publication titled *The Military Maxims of Napoleon*, which contains
10 115 principles. The impact of the Napoleonic period (1790-1895) had an influence
11 on the American Civil War. Each of these historical military leaders has made an
12 impact on today's definition and meaning of strategic thinking.
13
14 <u>Sun Tzu</u>
15
16     China offers us one of the first influences of strategic thinking. Sun Tzu (544-
17 496 B.C.) was a Chinese military general, strategist, writer and philosopher who
18 lived in ancient China. He is traditionally credited as the author of *The Art of War,*
19 written in 512 B.C., an influential work of military strategy that has affected
20 Western and East Asian philosophy and military thinking. His work is well-known
21 for presenting a philosophy of war for managing conflicts and winning battles. It is
22 accepted as a masterpiece on strategy and has been frequently cited and referred to
23 by generals and theorists since it was first published, translated, and distributed
24 internationally (McNeilly 2001). Tzu's principles can be applied to the battlefield,
25 public administration, business management, educational leadership, diplomacy,
26 and international negotiation.
27     The key to Sun Tzu's thinking is that he realized that all plans are temporary.
28 He knew that a plan can become outdated and obsolete as soon as it was created.
29 He noted that the decision to position one's forces in competition depended on two
30 major factors: (a) objective conditions in the physical environment and (b) the
31 subjective beliefs of competitors in that environment. In this, Sun Tzu generated
32 beliefs shared by the most elite strategists and strategic theorists from his time to
33 the present. He believed that strategy requires rapid, thoughtful responses to
34 changing conditions based on sound judgment and principles.
35     Sun Tzu was known for hundreds of principles and quotes. For example, he
36 said that he could foresee victory or defeat; and, those generals following his
37 advice would conquer. Likewise, those not following his counsel would be
38 defeated (Sun Tzu, pg.1). He further stated:
39
40     • All warfare is based on deception.
41     • Hence, when able to attack we must seem unable; when using our forces we must
42       seem inactive; when we are near we must make the enemy believe we are far
43       away, we must make him believe we are near.
44     • Hold out baits to entice the enemy. Feign disorder and crush him.

- If he is secure at all points, be prepared for him. If he is in superior strength, evade him.
- If your opponent is of choleric temper, seek to irritate him. Pretend to be weak that he may grow arrogant.
- If he is taking his ease, give him no rest. If his forces are united, separate them.
- Attack him where he is unprepared, appear where you are not expected (pgs. 3-4)
- [Finally,] These military devices, leading to victory, must not be divulged beforehand.

Sun Tzu further believed that what enables a wise sovereign and the good general to strike and conquer successfully, achieve success that of the ordinary man, and obtain advantage, is foreknowledge. He claimed that this knowledge of the enemies' activities and dispositions could only be obtained from other men. Hence, he employed the use of *spies*. Sun Tzu utilized a a system of five classes of spies: (a) local spies, (b) inward spies, (c) converted spies, (d) doomed spies, and (e) surviving spies. When these five kinds of spies are all at work, none can discover the secret system—*the divine manipulation of the threads*—the sovereign's most precious faculty:

- Having *local spies* means employing the services of the inhabitants of a district.
- Having *inward spies*, making use of officials of the enemy.
- Having *converted spies*, getting hold of the enemy's spies and using them for our own purposes.
- Having *doomed spies*, doing certain things openly for purposes of deception, and allowing our spies to know of them and report them to the enemy.
- *Surviving spies*, finally, are those who bring back new from the enemy's camp (pgs. 60-61).

Today, *The Art of War* influences more than just military strategy. Everyone from business leaders to educational leaders to sports coaches studies the work and principles of Sun Tzu.

*Alexander the Great*

Alexander the Great (356-323 B.C.) was the first general to prove that a smaller force using the right effective military strategies and tactics could consistently defeat a larger foe. Aristotle was Alexander's tutor, and he taught him sensitivity to other cultures. As such, not a single country occupied by Alexander ever rebelled against him. Aristotle used the Socratic method of questioning to train Alexander and his companions to seek facts, process and analyze them properly to create new information and knowledge. Alexander led battles by charging in front of his troops, not by leading from behind. As a result, he was extremely successful and was very well-known for having the ability to quickly mobilize his armies and resources effectively to the end and never losing a battle in over 12 years.

1    Alexander's creative military strategic thinking has influenced leaders
2  throughout the ages. A large part of his success was his army. It was his father,
3  Phillip II who revolutionized the Army, but Alexander took them to another level.
4  He first employed engineers to develop siege weapons, and then developed a core
5  of the army—the *phalanx*—a highly trained infantry. These soldiers were
6  positioned in a box formation, making it impossible to be attacked from any other
7  than frontal position. All soldiers in the phalanx were obedient, and very loyal.
8  They carried light uniforms, making it possible for them to maneuver on the field.
9  They were armed with long, 18-20 meters pikes. Every soldier was required to
10 place his pike on the shoulder of the man before him, which further increased the
11 defensive stance of the phalanx. Every unit of the phalanx had its own
12 commander, which made communication easier. Mathematically speaking, each
13 unit of the phalanx consisted of 1540 men, divided into three subdivisions of 512
14 men. Each division was divided in 32 *dekas*, or a line of 10, later 16 warriors
15 (Mishko 2013).
16    The strength of the Greek phalanx lay in the endurance and discipline of the
17 soldiers who made up the closely-packed rectangular formation of shields and
18 spears. Once the phalanx was formed, the soldiers would advance slowly toward
19 the opposing army, fending off offensive blows with their shields and holding the
20 formation tightly in order to break through the ranks of the other side. Since the
21 use of reserve forces in battle was not conceived of before the fifth century BC, a
22 battle was decided by the formations initially placed in the field and, consequently,
23 the men who made up the phalanx formations had to be prepared to outlast, as well
24 as out-fight, their opponents. Once the opponents engaged each other on the field,
25 the battle was on until one side broke ranks and was defeated. The phalanx, then,
26 could be employed in battle in a great `pushing match' with the front-liners
27 literally being pushed forward by the shields of the soldiers behind them or, as the
28 phalanx evolved, as a `battering ram' to break the front lines while cavalry harried
29 the flanks.
30    In all the battles he participated, Alexander the Great led from the front of the
31 battle. He believed he was able to strike fear in the opposing army while creating
32 inspiration his own troops. However, probably the biggest strength of the Army of
33 Alexander was its mobility. Alexander was a brilliant mind, a great tactician and
34 military specialist. He frequently made adjustments in the battles, and he needed
35 his troops to be able to move quickly and relocate from one place to another at a
36 moment's notice. Moreover, Alexander always scouted the terrain where the battle
37 occurred, and he tried to maximize the potential and advantages of the terrain.
38 These lessons, first mastered by Alexander, can most definitely be adapted to serve
39 effectively in today's boardroom or executive suite.
40
41 Napoleon Bonaparte
42
43    The study of early modern military strategists contributes to the understanding
44 of the study of how strategy emerged. Napoleon Bonaparte (1769-1821)
45 exemplifies strategic thinking in that he demonstrated the power of ideas over

material resources to achieve goals. The Napoleonic era ranged from 1790 to 1815. Napoleon, from a very young age, was fascinated with the military. He studied great military strategists as his way to ensure he would become a captain. He ruled the French Empire from 1779-1821.

Napoleon is best-known for employing the strategies of *central position* and the *indirect approach* throughout his campaigns in the early nineteenth century. Which strategy he used depended on factors such as (a) terrain, (b) weather, (c) troop numbers, (d) and overall capabilities. For example, when he was outnumbered, he would use the central position strategy, maneuvering his army to a position between the opposition troops facing him and driving a wedge between them. He would then seek battle with one army while leaving a masking force to hold the second in place.

When Napoleon had comparable strength to his opponents and room to maneuver, he would apply the strategy of indirect approach. This included positioning a small force to the front of the opposition to pretend a major attack. At the same time, the main force would march to the enemy's rear, placing Napoleon's troops on the enemy's lines of communication and supply; this would force the enemy to fight at a disadvantage and ultimately withdraw.

General Thomas "Stonewall" Jackson

General Stonewall Jackson (1824-1863) was ahead of his time with regard to battlefield strategies and tactics. He believed in manipulation and surprise as powerful weapons, not just as enhancements to the weapons of war. He demonstrated brilliance in his 1862 Shenandoah campaign while using deception and speed of maneuver as force multipliers. General Jackson's motto during the American Civil War was to "mystify, mislead, and surprise" the enemy.

General Nathan Forrest Bedford

Nathan Bedford Forrest, another Southern general, summed up his own strategic theory with the phrase, "Get there first with the most men." This short phrase encompasses a core of strategic theory that includes surprise, maneuver, objective, speed, capabilities, and mass.

Yasser Serawan

The game of chess originated in India during the sixth century and arrived in Europe by the tenth century. According to modern International Grandmaster Chess Champion Yasser Serawan (1994), there are two types of advantages: *static* and *dynamic*. A static advantage is a long-term one—permanent. A dynamic advantage is similar to a tactic—temporary. Tactics are the military science of securing objectives set by strategy—the overall planning conduct of large-scale military operations. For this reason, it is vital to take every opportunity to create static advantages; and, the role of strategy is to create static advantages, such as:

more material and resources, superior mobility, exceptional structure, additional space/territory, and safe position. Strategy, then, is the purposeful pursuit of a simple goal: to gain an advantage of some sort over your opponent.

*Strategic Thinking in the Business Context*

*Strategic thinking* is the process of anticipating the actions and reactions of competitors and preparing accordingly. It means utilizing tools of analysis and tactics to make wise decisions and take wise and judicious action that will give the best possible chance of gaining advantage while achieving stated objectives. Mintzberg (1994) describes *strategic thinking* as a specific way of thinking that employs creativity and intuition with the desired outcome being "an integrated perspective of the enterprise" (pg.12).

Following the views of Mintzberg, Leidktka (1998) defines strategic thinking as a particular *way* of thinking, with specific attributes. Liedktka's argues that the essential elements of strategic thinking are captured in five unique, but interrelated elements: system perspective, focused intent, thinking in time, hypothesis driven, and intelligent opportunism. She states, "strategic intent provides focus that allows individuals within an organization to marshal and leverage their energy, to focus attention, to resist distraction, and to concentrate for as long as it takes to achieve a goal" (Liedktka 1998 p. 123). She further claims that, "strategic thinking inevitably is fundamentally concerned with and driven by, the shaping and re-shaping of intent".

Through research of practical experiences, several researchers apply Mintzberg's (2009) definition to a business context, suggesting that effective strategic thinking leads to successful competitive advantage:

Strategic thinking is an individual thinking activity that benefits organization. Its purpose is to discover competitive strategies to position the organization significantly differently from the present. Thinking strategically is not the same as preparing a strategic plan, which details tactics to be taken to achieve goals and objectives. Strategic thinking is thinking that contributes to broad, general, overarching concepts that focus the future direction of an organization based on anticipated environmental conditions (Goldman et al. 2009 p. 406).

In this environment, the key ingredients to success are leaders that recognize organizational effectiveness, continuity, and underlying change patterns. Many researchers support the claim that there is an over-reliance on linearity which does not fit with today's realities of accelerated change (Bolman & Deal 1994, Drucker 1995, Schreyogg & Noss 2000, Weick & Quinn 1999). Most researchers point to the importance of development of conceptual skills in order that leaders can: (a) apply information and concepts to practice; (b) see the organization as a whole and to understand how various parts of the organization relate to and effect each other; and (c) discern meaning in and to establish relationships between events and bits of information that, at first glance, would appear to be discrete and unrelated.

1
2  *Competitive Strategy*
3
4      The ability to think in this manner seems critical to the leaders' ability to
5  manage complexity in the 21st century. Interpretation is essential; however, making
6  sense is even more challenging. Strategic thinking skills are most critical in the
7  times when an outcome is uncertain and additional strategic action is needed.
8  Regardless of the cognitive structure that is presumed to underlie human
9  cognition, knowledge must be retrieved, activated, and/or recreated to influence
10 actions, behaviors, and perceptions.
11      Michael Porter (1947- ) one of the most influential scholars on business
12 strategy in the last 30 years has held a firm belief that "competition is at the core
13 of the success or failure of firms" (1995 p.1). He argues that strategy is all about
14 gaining a competitive edge—meaning situating the company to have competitive
15 strategy and competitive positioning. Moreover, he says strategic thinking is the
16 conduit. In other words, strategic thinking must be present for the organization to
17 be successful. Which, according to Porter (1985), means to be the best at what it
18 does; and, *best* refers to: (a) structure (attractiveness of industry) and (b) position
19 within the industry. Michael Porter states that strategic thinking is, "the big picture
20 of how the organization is going to win in its environment—whatever that is" (p.
21 31). He goes on to state that to be truly actually superior, one needs to have a great
22 strategic sense of how one organization is going to compete
23
24 *Assessing Strategic Thinking Skills in Leaders*
25
26      While strategic thinking is supported by the literature, assessment tools,
27 however, have not readily been available to measure the leader's ability to perform
28 these skills. They have not been widely studied empirically (Bonn, 2011).
29 Researchers drawing on the literature, identified the three metacognitive skills
30 which enable leaders to recognize patterns, interdependencies, and make
31 consequential decisions—*systems thinking*, *reframing*, and *reflection* (Daghir & Al
32 Zaydi 2005, Pisapia et al. 2005).
33      *The Strategic Thinking Questionnaire* (STQ[©]) is a reliable and valid
34 assessment tool designed to assesses the use of the mental processing skills of
35 *reflection*, *reframing*, and *systems thinking*. Results from the STQ[©] are designed to
36 provide an evaluation of the use of the three cognitive skills important to strategic
37 thinking revealing to the test takers their ability to think flexibly, conceptually, and
38 strategically. In addition, it enables respondents to compare their performance to
39 norms drawn from a baseline set of data. The STQ[©] identifies the best talent to
40 hire, promote and develop and is useful in self-assessment for personal growth.
41 These cognitive processes and the abilities required to perform these skills are
42 identified, displayed, and defined in Figure 2.
43
44 **Figure 2.** *Cognitive Processes Necessary to Practice Strategic Thinking*

| Concept | Description |
|---|---|
| SYSTEMS THINKING: The skill used to collect and think through and beyond information using the understanding of systems dynamics | There are three abilities in SYSTEMS THINKING: To think holistically To recognize patterns and interrelationships To recognize and act upon intrinsic systems imperatives of goal attainment, pattern maintenance, integration and adaption. |
| REFLECTING: The skill used to process information, create knowledge from it, and apply it through practice. | There are five abilities in REFLECTING: To recognize why certain choices work and other choices do not. To use double loop learning governing principles. To use perceptions, experience and knowledge to understand situation and how to think about them. To blend perceptions, experience, and knowledge and analysis while taking action. To use your current perceptions, experience, and knowledge and that of others from past experience to create an understanding of the present and the future |
| REFRAMING: the skill used to collect and organize information that defines situational realities | There are four abilities used in REFRAMING: To suspend judgment while appropriate is gathered. To be able to identify and understand mental models, paradigms and frameworks that are being used to frame a problem, situation or issue. To be able to use different mental models, paradigms, and frameworks to understand one situation. To review and reform one's own and others' mental models. |

*Note*: See original for full description of constructs: John Pisapia, Daniel Reyes-Guerra, & Eleni Coukos-Semmel. Developing the Leader's Strategic Mindset: Establishing the Measures, in *The Leadership Review, 5*(1), p. 48 (2005).

Consultants also use the assessment in organizational development activities and seminars. In addition, it enables respondents to compare their performance to norms drawn from a baseline set of data. The STQ[©] identifies the best talent to hire, promote and develop and is useful in self-assessment for personal growth. Consultants also use the assessment in organizational development activities and seminars.

The STQ[©] has been studied within the context of several populations, including professionals, leaders, and managers in both for-profit and non-profit agencies as well as with graduate students. The STQ[©] has also been translated into different languages and used by researchers in six different countries, including China (Mandarin and Cantonese), Malay, India, Iran, Turkey, as well as the United States. It appears to be generalizable to a broad cross-section of society. However,

due to the nature of differing item responses based on age, education, organizational position, and experience level, the STQ$^{©}$ may perform differently based on the population being examined (Pisapia et al. 2011). In total, there have been over 3,000 test takers.

Study Results

Several studies have been completed. Pisapia, Reyes-Guerra, and Yasin (2006) studied 138 for-profit and not-for-profit managers and executives. Pang and Pisapia (2012) conducted a study of 543 school principals in Hong Kong. Zsiga (2008) studied 540 YMCA directors in the United States. Pisapia, Pang, Hee, Ying, & Morris (2009) studied 328 students preparing for educational management roles in Hong Kong, Malaysia, Shanghai, and the United States. See Figure 3. Seven major impressions were found from statistical analyses presented from these studies. First, strategic thinking is strongly associated with self-reported effectiveness. Supervisors and managers in these samples scored lower than the executives as expected. Second, there is a cumulative impact when the three processes which make up strategic thinking are used. Third, the strength of the relationship between strategic thinking skills and leader success increases as leaders use the three processes in tandem. Fourth, the use of these skills is similar in the United States and Malaysia. Fifth, there is a significant relationship between strategic thinking and self-directed learning. Sixth, the use of these skills improves with age and experience—the younger you are the less you use these skills. Seventh, the STQ$^{©}$ appears free of cultural and gender bias; but reveals an age bias. The overall conclusion is that successful leaders use the three strategic thinking capabilities more often than less successful leaders.

*Environmental and Personal Characteristics and Use of Strategic Thinking Skills*

As many scholars have noted, when it comes to leadership, context is important (Pisapia 2009). For some researchers, organizational environment is an important factor contributing to leader behavior (Kolb et al. 2001). According to Kolb and his colleagues, environment dictates the choice of structure and the way the communication is implemented in the organization. Hoy and Miskel (1987) further identified four dimensions that could influence leader actions: (a) structural properties of the organization, (b) organizational climate, (c) role characteristics, and (d) subordinates' characteristics. For other researchers, personal characteristic and traits of the leaders may also affect their style of leadership and eventually their effectiveness (Luthens 1981). The study of leadership characteristics and traits has a long history; it was the first organized approached to studying leadership.

The research on the level of parental education and its effects on their children's educational attainment are seemingly endless. As one might expect, parental educational level is both positively and significantly related to the academic success of their children (Dubow et al. 2009, Leppel et al. 1991,

Naumann et al. 2003, Spera et al. 2009). Indeed, "one of the most consistent predictors of children's level of educational attainment is their parents' level of educational attainment" (Spera et al. 2009 p. 1141). This finding is not only true within the United States, but these positive correlations have been found in almost every other country studied (Social Situation Observatory, 2013). In a study on the long–term effects of parental education on children's educational and occupational achievement, researchers found that the effects of parental education had an indirect effect on both their children's educational achievements, as well as their eventual occupational achievements (Dubow et al. 2009). Dubow and his colleagues further concluded:

> A child exposed to parents who model achievement-oriented behavior (e.g., obtaining advanced degrees; reading frequently; encouraging a strong work ethic) and provide achievement-oriented opportunities…should develop the guiding belief that achievement is to be valued, pursued, and anticipated. This belief should then in turn promote successful outcomes (2009, p. 3).

**Methodology**

*Research Design*

This study employed a quantitative, non-experimental, cross-sectional survey research design. A pre-existing instrument, *The Strategic Thinking Questionnaire* (*STQ[©]v8*), which has been found to be accepted as both valid and reliable in previous statistical tests was selected as the primary source of data collection (Pisapia & Reyes-Guerra 2009).

*Participants*

Participants selected and invited to participate in the study were identified as undergraduate (first, second, third, fourth and fifth year) students and graduate (MBA) students enrolled within the Department of Business Management at the University of Patras, Greece. The students ranged in age between 18-24 years old and included both males and females.

*Instrumentation*

*The Strategic Thinking Skills Questionnaire:* The STQ[©] is a 58-item survey presented in two sections: *Section I: Strategic Thinking Skills* (items #1-52) and *Section II: Demographic Information* (items # 53-58). The STQ[©] instrument version eight, for this study, was translated into modern Greek. The instrument takes approximately fifteen minutes to complete and is capable of being either self-scored or electronically-scored. For this study, the electronic version of the instrument was used for all participants. To overcome validity issues inherent in

1  self-reported instruments, the STQ<sup>©</sup> contains two indicators: (a) *Omission Rate*
2  (number of omitted responses), and (b) an *Inconsistency Index* (degree of response
3  inconsistency). If scores on the paired items deviated more than one point, the case
4  was eliminated from the overall analyses. The survey also contains seven reverse-
5  scored items to reduce the effect of patterned answers.
6      The survey instructions direct students to rate, on a five-point scale, how often
7  they used strategic thinking skills when faced with a problem, dilemma or
8  opportunity. Responses were recorded using a Likert-type scale: 1=*rarely or*
9  *almost never uses*, 2=*once in a while uses*, 3=*sometimes uses*, 4=*often uses*,
10  and, 5=*frequently or almost always uses*. The last seven survey questions
11  request demographic information, (i.e., gender, age, level of parents' education,
12  and student status).

13
14  <u>Validity and Reliability</u>
15

16      Finding no existing valid measures, Pisapia and his colleagues, (2005) worked
17  to define three meta-cognitive skills that taken together create strategic thinking.
18  Pisapia (2005) and his research team used these definitions to guide their research
19  in creating the *Strategic Thinking Questionnaire*. A panel of five experts, with
20  backgrounds in strategic thinking was assembled to review the original 189 items,
21  which were sorted into one of three categories (Pisapia et al. 2011). The result of
22  the discussion and feedback sessions between the research team and the panel led
23  to the creation of the original version of the STQ<sup>©</sup>. The STQ<sup>©</sup> was created to
24  measure the theoretically identified constructs of *systems thinking*, *reframing,* and
25  *reflection*, created by Pisapia, Reyes-Guerra and Coukos-Semmel in 2005.
26      The STQ<sup>©</sup> has since undergone several iterations to improve and strengthen
27  the scale from its original creation in 2005. In the first trial, the STQ<sup>©</sup>, was a 44-
28  item survey used to study 136 for-profit and non-profit leaders by Pisapia, Reyes-
29  Guerra, and Yasin, (2006). This trial was of little consequence, as it did not control
30  for issues correlated with self-reporting as well as the inability for the three
31  subscales, (reframing, reflection and systems thinking) to be empirically derived.
32  However, in 2007, Pang & Pisapia began researching the use of strategic thinking
33  skills of 543 school leaders in Hong Kong. After having the instrument translated
34  into Chinese, having the subscales empirically supported, and controlling for
35  issues with self-reporting data, a "link to leader effectiveness was found along
36  with the importance of role and context in the use of strategic thinking skills"
37  (Pang & Pisapia 2012 p. 5).
38      The second iteration of the STQ<sup>©</sup> was a 48-item instrument crafted in 2008.
39  During this time, measures were included to "overcome potential bias found in
40  self-reported data and convergent validity was established" (Pisapia et al. 2011 p.
41  5). In the next trial, Pisapia, Pang, Hee, Lin and Morris (2011) conducted a "multi-
42  country study of graduate students who were preparing for management positions"
43  (p.5). During this study, the researchers were only able to uncover data that
44  supported two empirical factors: *systems thinking and reflecting*. In reviewing
45  these two factors, the researchers found that both skills (*systems thinking and*

1 *reflection*) were influenced by age, experience and educational level.
2 Simultaneously, a study by Zsiga (2008), conducted a study measuring self-
3 directed learning readiness as well as leader effectiveness with (458) executive
4 directors in the Young Men's Christian Association (YMCA). Zsiga's research
5 "provided evidence of a positive relationship between (a) strategic thinking
6 orientation and leader effectiveness, and (b) a robust association of the strategic
7 thinking skills scale with the self-directed learning scale" (Pisapia et al. 2011 p. 6).

8     In 2010, Raghavan, Shukla, and Shaid, a research team from India, validated
9 the three original constructs. During this trial, they were also able to narrow the
10 STQ$^©$'s empirically derived 48-items down to 20 items. This research looked at
11 impact of strategic thinking on firm impact with 25 participants. The study
12 concluded that, "*cognitive diversity* and *strategic thinking* were significantly
13 related to long term firm performance of return on equity but not short term
14 relative market share" (as cited in Pisapia et al. 2011 p. 6).

15     In the case of Brennen (2010), after reviewing 806 cases of for-profit leaders,
16 it was found that (a) "the relationship between authentic and transformational
17 leadership, strategic thinking orientation significantly increases as the degree of
18 strategic thinking orientation leadership increases" (Pisapia et al. 2011 p. 6) and
19 (b) "strategic thinking orientation predicted transformational leadership as
20 measured by Bass's MLQ" (Pisapia et al. 2011 p. 6). Penny (2010) used the STQ
21 to research 122 National Executive Fire Chiefs in the U.S.A. Using *systems*
22 *thinking* and *reflection*, the two previously empirically derived subscales, found
23 that (a) "educational level, length of service, and age were positively associated
24 with higher use of strategic thinking skills", and that (b) "age was a moderator of
25 the relationship of *systems thinking*, *reflection* and information and computer
26 technology comfort" (Pisapia et al, 2010, p.6).

27     Pisapia, Morris, Cavanagh, and Ellington (2011) subjected 1,117 cases of
28 participants holding leadership positions in for-profit or nonprofit sectors in the
29 USA from the research previously cited to empirical analysis to determine latent
30 factors, means and standard deviations. The panel found that the STQ$^©$ "appears to
31 be generalizable to a wide spectrum of society," "no significant threats to
32 reliability" (Pisapia et al. 2011 p. 12). They reported alphas of .76 for *systems*
33 *thinking*, .73 for *reframing*, and .76 for *reflection* (Pisapia et al. 2011 p. 10).

34     Pisapia et al. (2011) subjected 1,117 participants holding leadership positions
35 in for-profit or nonprofit sectors in the US from the research previously cited to
36 empirical analysis in to determine latent factors, means and standard deviations.
37 The panel found that the STQ$^©$ "appears to be generalizable to a wide spectrum of
38 society and no significant threats to reliability" (p. 12). They reported alphas of .76
39 for *systems thinking*, .73 for *reframing*, and .76 for *reflection*. Figure 4 displays the
40 reliability coefficients for all existing versions of the instrument.

41

42 **Figure 4.** *Means, Standard Deviations, and Reliability Coefficients for Subscales of*
43 *STQ$^©$ Versions*

| SUBSCALES | | | | |
|---|---|---|---|---|
| STQ$^©$ Version | Reflecting | Reframing | Systems | Strategic Thinking |

| | | | Thinking | Skills (STS) |
|---|---|---|---|---|
| STQ$^{©}_{V1}$ (2004) | | | | |
| Mean | 4.14 | 3.52 | 4.08 | 3.98 |
| Standard Deviation | .55 | .61 | .44 | .52 |
| Cronbach's Alpha (α) | .84 | .72 | .82 | .84 |
| Number of items | 17 | 18 | 17 | 52 |
| STQ$^{©}_{V2}$ (2005) | | | | |
| Mean | 4.04 | 3.81 | 3.81 | 3.88 |
| Standard Deviation | .39 | .51 | .41 | .43 |
| Cronbach's Alpha (α) | .85 | .77 | .83 | .91 |
| Number of items | 15 | 10 | 13 | 38 |
| STQ$^{©}_{V3}$ (2007) | | | | |
| Mean | 3.48 | 3.45 | 3.55 | 3.50 |
| Standard Deviation | .28 | .29 | .32 | .25 |
| Cronbach's Alpha (α) | .75 | .78 | .71 | .89 |
| Number of items | 12 | 12 | 12 | 36 |
| STQ$^{©}_{V4}$ (2008) | | | | |
| Mean | 3.66 | 3.43 | 3.67 | 3.59 |
| Standard Deviation | .42 | .43 | .49 | .41 |
| Cronbach's Alpha (α) | .74 | .82 | .87 | .93 |
| Number of items | 14 | 17 | 17 | 48 |
| STQ$^{©}_{V6}$ (2009) | | | | |
| Mean | 3.81 | 3.71 | 3.82 | 3.79 |
| Standard Deviation | .46 | .50 | .49 | .44 |
| Cronbach's Alpha (α) | .84 | .76 | .87 | .93 |
| Number of items | 17 | 10 | 17 | 44 |
| STQ$^{©}_{V7}$ (2009) | | | | |
| Mean | 3.95 | 3.72 | 4.05 | 3.91 |
| Standard Deviation | .56 | .46 | .46 | .39 |
| Cronbach's Alpha (α) | .76 | .73 | .77 | .81 |
| Number of items | 18 | 16 | 18 | 52 |
| STQ$^{©}_{V8}$ *GR* (2019) pilot study | | | | |
| Mean | 3.88 | 3.94 | 4.00 | 3.90 |
| Standard Deviation | .54 | .43 | .59 | .47 |
| Cronbach's Alpha (α) | .88 | .77 | .89 | .94 |
| Number of items | 18 | 16 | 18 | 52 |

*Procedures*

Prior to administration, the STQ$^{©}$ instrument and consent form were translated into Greek (STQ-GR$^{©}$).The translated instrument was verified by a panel of Greek academicians, then retranslated back into English and reviewed by the STQ$^{©}$ developers, then back-translated. The back-translated version and the original version were compared and then, once again studied by a panel of experienced Greek academicians. Permission was sought by the Institutional Review Board (IRB) to collect data. The Greek version was first field-tested with a group of 25 students and psychometrically tested. Reliability analyses were run.

1   Reliability coefficients for each domain were: .88 for *reflection*, .77 for *reframing*,
2   and .89 for *systems thinking*. The instrument and consent form were subsequently
3   uploaded to the *Qualtrics™* server.
4        Each student enrolled in the Business Management program in the Spring
5   semester 2019 (approximately 700 students) received an email communication
6   requesting participation in the study from one of the Department's professors. The
7   correspondence included the link to the *STQ-Greek[©]* survey, including the consent
8   form. Data were exported from *Qualtrics™* into SPSS. Descriptive and inferential
9   statistics were run to describe the participants and address each of the study's three
10  research questions.
11
12
13  **Findings and Results**
14
15  *Characteristics of Survey Respondents*
16
17       Sixty-nine (69) of students completed usable questionnaires, which accounted
18  for approximately 10% response rate. Just over a third (39.1%) respondents were
19  male ($n$=21); and 59.4% respondents identified as female ($n$=41). Of the total
20  participants, 79.3% ($n$=54) were undergraduate students, and 21.7% ($n$=15) were
21  graduate students. About one-third (29%) were 24 years old or older. Nearly 25%
22  were age 21; about 10% were 19 years old or younger; about 16% were 20 years
23  old; and, about 15% were 22 years old. Almost twenty-two percent (21.7%) of the
24  participants ($n$=15) were of graduate status, and 79.3% ($n$=54) were
25  undergraduates.
26
27  *Use of Strategic Thinking Skills*
28
29       Results and findings are presented in the order of the study's three research
30  questions with supporting data tables. Discussion and recommendations will
31  follow.
32
33       $Q_1$: *How do students in Greece preparing for business administration use strategic*
34           *thinking skills?*
35
36       To address Research Question One, survey data were first exported from the
37  Qualtrics survey platform into the *IBM Statistical Program for the Social Sciences*
38  *(SPSS), Version 25.0*. Prior to running any statistical analyses, items 21, 28, 30, 39,
39  40, and 45 were reverse-scored. Next, four new variables were created in SPSS
40  (i.e., *reflection, reframing, systems thinking,* and *total strategic thinking skills*
41  [*STS*]). A *reflection* score was created by collapsing the following 18 items: 2, 5, 8,
42  11, 14, 17, 20, 23, 25, 28, 31, 34, 37, 40, 43, 46, 48, and 49. A r*eframing* score was
43  created by collapsing the following 16 items: 1, 4, 7, 10, 13, 16, 19, 27, 30, 33, 36,
44  39, 42, 45, 51, and 52. And, a *systems thinking* score was created by collapsing the
45  following 18 items: 3, 6, 9, 12, 15, 18, 21, 22, 24, 26, 29, 32, 35, 38, 41, 44, 47,

1  and 50. A *Total STS* score was computed by summing the *reflection, reframing*,
2  and *systems thinking* scores and dividing by three.
3      The maximum score on the scale is five (*almost always uses*), and the lowest
4  possible score is one (*never uses*). Average to above average scores (3.0-5.0) on
5  the STQ[©] suggest that the respondent is effective in using the strategic thinking
6  skills, meaning that he or she is most likely to possess the skills to be a strategic
7  thinker. The higher the scores, the more positive the prediction for effective
8  functioning in meeting environmental demands and pressures. On the other hand,
9  an inability to be an effective strategic thinker is suggested by low scores. See
10 Table 1 for usage of strategic thinking skills for aspiring Greek leaders by
11 demographic factor.
12
13 **Table 1.** *Use of Strategic Thinking Skills (STS) in Business Management Students*
14 *in Greece by Demographic Factor*

| | | | Total STS | | Reflection | | Reframing | | Systems Thinking | |
|---|---|---|---|---|---|---|---|---|---|---|
| Gender | N | % | M | SD | M | SD | M | SD | M | SD |
| Male | 28 | 39.1 | 3.71 | .41 | 3.69 | .48 | 3.65 | .38 | 3.80 | .53 |
| Female | 41 | 60.1 | 3.51 | .18 | 3.50 | .29 | 3.48 | .28 | 3.57 | .22 |
| Total | 69 | 100.0 | 3.59 | .31 | 3.58 | .37 | 3.54 | .23 | 3.66 | .39 |
| Age | N | % | M | SD | M | SD | M | SD | M | SD |
| 18 years and less | 1 | 1.4 | 3.17 | -- | 3.16 | -- | 3.19 | -- | 3.28 | -- |
| 19 years | 7 | 10.1 | 3.47 | .21 | 3.49 | .39 | 3.40 | .23 | 3.52 | .12 |
| 20 years | 11 | 15.9 | 3.49 | .22 | 3.39 | .22 | 3.53 | .33 | 3.54 | .31 |
| 21 years | 17 | 24.6 | 3.53 | .12 | 3.55 | .25 | 3.44 | .23 | 3.61 | .25 |
| 22 years | 10 | 14.5 | 3.55 | .19 | 3.62 | .28 | 3.47 | .33 | 3.56 | .19 |
| 23 years | 3 | 4.3 | 3.56 | .15 | 3.43 | .17 | 3.48 | .29 | 3.78 | .31 |
| 24 years + | 20 | 29.0 | 3.79 | .46 | 3.75 | .52 | 3.75 | .37 | 3.87 | .57 |
| Total | 69 | 100.0 | 3.59 | .31 | 3.58 | .37 | 3.54 | .23 | 3.66 | .39 |
| Mother's Education | N | % | M | SD | M | SD | M | SD | M | SD |
| Elementary School | 2 | 2.8 | 3.64 | .00 | 3.67 | .00 | 3.75 | .00 | 3.50 | .00 |
| Junior High School | 9 | 13.0 | 3.43 | .23 | 3.89 | .28 | 3.46 | .31 | 3.48 | .22 |
| High School | 16 | 23.1 | 3.55 | .17 | 3.46 | .27 | 3.64 | .22 | 3.53 | .25 |
| Technical Institute | 8 | 11.5 | 3.65 | .23 | 3.60 | .29 | 3.50 | .35 | 3.84 | .23 |
| Bachelors Degree | 27 | 39.1 | 3.69 | .41 | 3.71 | .46 | 3.57 | .41 | 3.79 | .50 |
| Masters Degree | 6 | 8.6 | 3.47 | .23 | 3.52 | .39 | 3.32 | .16 | 3.57 | .32 |
| Doctoral Degree | 1 | 1.4 | 3.31 | -- | 3.28 | -- | 3.44 | -- | 3.22 | -- |
| Total | 69 | 100.0 | 3.59 | .31 | 3.58 | .37 | 3.54 | .23 | 3.66 | .39 |
| Father's Education | N | % | M | SD | M | SD | M | SD | M | SD |
| Elementary School | 3 | 4.3 | 3.68 | .08 | 3.78 | .19 | 3.65 | .18 | 3.63 | .22 |
| Junior High School | 9 | 13.0 | 3.95 | .59 | 3.98 | .64 | 3.79 | .51 | 4.07 | .69 |
| High School | 16 | 23.1 | 3.45 | .19 | 3.36 | .23 | 3.49 | .29 | 3.49 | .23 |
| Technical Institute | 15 | 21.7 | 3.56 | .17 | 3.52 | .29 | 3.55 | .22 | 3.60 | .23 |
| Bachelors Degree | 16 | 23.1 | 3.31 | .22 | 3.56 | .22 | 3.49 | .33 | 3.69 | .31 |
| Masters Degree | 7 | 10.1 | 3.46 | .19 | 3.54 | .34 | 3.35 | .11 | 3.50 | .35 |
| Doctoral Degree | 3 | 4.3 | 3.46 | .20 | 3.72 | .38 | 3.15 | .25 | 3.78 | .48 |
| Total | 69 | 100.0 | 3.59 | .31 | 3.58 | .37 | 3.54 | .23 | 3.66 | .39 |
| Student Status | N | % | M | SD | M | SD | M | SD | M | SD |
| Undergraduate – 1st | 4 | 5.8 | 3.56 | .26 | 3.67 | .45 | 3.48 | .23 | 3.54 | .18 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Undergraduate – 2nd | 4 | 5.8 | 3.30 | .02 | 3.20 | .15 | 3.27 | .18 | 3.43 | .05 |
| Undergraduate – 3rd | 23 | 33.3 | 3.51 | .21 | 3.51 | .27 | 3.44 | .38 | 3.59 | .34 |
| Undergraduate – 4th | 14 | 20.3 | 3.56 | .87 | 3.54 | .24 | 3.49 | .18 | 3.65 | .18 |
| Undergraduate – 5th | 9 | 13.0 | 3.47 | .21 | 3.39 | .21 | 3.56 | .30 | 3.45 | .21 |
| Masters/Graduate | 15 | 21.7 | 3.90 | .45 | 3.89 | .52 | 3.82 | .35 | 3.99 | .57 |
| Total | 69 | 100.0 | 3.59 | .31 | 3.58 | .37 | 3.54 | .23 | 3.66 | .39 |

Raw scores on the STQ$^{©}$ should be tabulated and converted into standard scores based on a mean of 100 and standard deviation of 15. This scoring system resembles that which is used by cognitive intelligence tests that generate an intelligence quotient (IQ). Average to above average scores on the STQ$^{©}$ suggest that the respondent is effective in using the strategic thinking skills, meaning that he or she is most likely to possess the skills to be a strategic thinker. The higher the scores, the more positive the prediction for effective functioning in meeting environmental demands and pressures. On the other hand, an inability to be an effective strategic thinker is suggested by low scores. As a rule of thumb, Pisapia suggests and applies scores of 4.0 and higher suggest a strong ability to use the skill. Scores between 3.9 and 3.1 suggest an average ability to use the skill. And, scores below 3.0 suggest a weak ability to use the skill.

Descriptive statistics were run. Means and standard deviations were computed for each survey item and construct: (a) total STS score (*M*=3.59, *SD*=.31), (b) *reflection* (*M*=3.58, *SD*=.37), (c) *reframing* (*M*=3.54, *SD*=.23), and (d) *systems thinking* (*M*=3.66, *SD*=.39). All scores are considered average to above average. Appendix A displays the means, standard deviations, and rank for each survey item. Study participants scored above a 4.0 on four out of the sixteen items (25%) measuring *reframing*. These items were #s 1, 13, 36 and 42.

Item 1: I seek different perspectives. (*M*=4.21, *SD*=.63)
Item 36: Listen to everyone's version of what happened before making a decision.
(*M*=4.21, *SD*=.88)
Item 42: Engage in discussions with those who have different beliefs or assumptions
about the situation. (*M*=4.11, *SD*=.57)
Item 13: Engage in discussions with those whose values differ from yours. (*M*=4.01,
*SD*=.82)

Study participants scored above a 4.0 on five of the eighteen items (24%) measuring *reflecting*. These items were #s 34, 23, 17, 8, and 2.

Item 34: Think about the results of your actions. (*M*=4.54, *SD*=.63)
Item 2: Review the outcomes of past decisions. (*M*=4.44, *SD*=.84)
Item 17: Consider the effect of past actions in similar situations. (*M*=4.17, *SD*=.81)

Item 8: Consider how you could have handled the situation after it was resolved.

(*M*=4.11, *SD*=.82)

Item 23: Set aside specific periods of time to think about why you succeeded or failed.

(*M*=4.08, *SD*=.84)

Study participants scored above a 4.0 on nine of the eighteen items (50%) measuring *systems thinking*. These items were #s 6, 22, 38, 9, 18, 12, 26, 50, and 44.

Item 6: Try to find a common goal when two or more parties are in conflict. (*M*=4.32,

*SD*=.79)

Item 22: Try to understand how the facts presented in a problem are related to each other.

(*M*=4.25, *SD*=.65)

Item 38: Look at the "big picture" in the information available before examining the

details. (*M*=4.24, *SD*=.77)

Item 9: Find that in most cases eternal changes require internal changes. (*M*=4.15,

*SD*=.79)

Item 18: Find that one thing indirectly leads to another. (*M*=4.10, *SD*=.64)

Item 12: Search for the cause before taking action. (*M*=4.08, *SD*=.82)

Item 26: Try to understand how the people in the situation are connected to each other.

(*M*=4.08, *SD*=.84)

Item 50: Ask yourself how the "dots" connect in this situation. (*M*=4.01, *SD*=.75)

Item 44: Think about how different parts of the organization influence the way things are

done. (*M*=4.00, *SD*=.70)

*Impact of Environmental/Personal Characteristics*

*Q₂: How do environmental and personal characteristics, such as gender, age, parents' level of education, and student status affect the use of strategic thinking skills?*

To address this research question, first scores were disaggregated by each of the environmental and personal characteristics (i.e., gender, age, mother's education, father's education, and student status). Next, univariate analysis of variance tests were performed to test differences in means among the different levels of each of the demographic groups. An independent samples *t*-test was

conducted to test differences in reflection, reframing, systems thinking, and overall STS mean scores between male and female participants. ANOVA (analysis of variance) tests with post-hoc tests (Tukey HSD) were employed to examined differences in means scores among the levels of parents' education, and student status.

*Age* consisted of seven levels: (a) 18 years old and younger, (b) 19 years old, (c) 20 years old, (d) 21 years old, (e) 22 years old, (f) 23 years old, and (g) 24 years old and older. Choices for both *mother's* and *father's highest level of education attained* also consisted of seven levels: (a) elementary school, (b) junior high school, (c) high school, (d) technical institute, (e) bachelors degree, (f) masters degree, and (g) doctoral degree. *Student status* consisted of six levels from which to choose: (a) undergraduate first year student, (b) undergraduate second year student, (c) undergraduate third year student, (d) undergraduate fourth year student, (e) undergraduate fifth year student, and (f) graduate (masters) student. All tests were performed at the $\alpha$ = .05 significance level. Table 2 displays the results of these analyses, indicating statistical significance with an asterisk (*). As seen in Table 2, for *reflection*, there were three statistically significant differences found. These differences were among the levels of *gender* ($p$ = .037*), *father's educational level* ($p$ = .005*), and *student status* ($p$ = .002*). Tukey HSD (Honestly Significant Difference) post-hoc analyses were conducted to detect between which groups the differences existed. The results of the post-hoc analyses revealed that males scored significantly higher ($M$=3.69, $SD$=.38) than females ($M$=3.50, $SD$=.29). Individuals with father's highest educational level of junior high school scored significantly higher ($M$=3.98, $SD$=.64) than individuals with father's with highest educational level of high school degree ($M$=3.36, $SD$=.23). Masters students scored significantly higher ($M$=3.89, $SD$=.52) than second-year undergraduate students ($M$=3.20, $SD$=.15). And, individuals 24 years old and older scored significantly higher ($M$=3.75, $SD$=.52) than individuals 18 and younger ($M$=3.16).

For *reframing*, four statistically significant differences were found. These differences were among the levels of *gender* ($p$ = .033*), *age* ($p$ = .038*), *father's educational level* ($p$ = .032*), and *student status* ($p$ = .003*). Post-hoc tests revealed that males scored significantly higher ($M$=3.65, $SD$=.38) than females ($M$=3.48, $SD$=.28). Individuals with father's highest educational level of junior high school scored significantly higher ($M$=3.79, $SD$=.56) than individuals with father's with highest educational level of doctoral degree ($M$=3.15, $SD$=.25). Masters students scored significantly higher ($M$=3.82, $SD$=.35) than second-year undergraduate students ($M$=3.27, $SD$=.18). And, individuals 24 years old and older scored significantly higher ($M$=3.75, $SD$=.37) than individuals 18 and younger ($M$=3.19).

**Table 2.** *Moderation Effect Between Characteristics and Strategic Thinking Skills (STS)*

| Characteristic | STS | $SS$ | $Df$ | MS | $F$ | $p$* | $\eta^2$ |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gender | Reflection | .608 | 1 | .608 | 4.518 | .037* | .063 |
| Age | Reflection | 1.370 | 6 | .228 | 1.713 | .133 | .142 |
| Mother Education | Reflection | 1.154 | 6 | .192 | 1.407 | .226 | .120 |
| Father Education | Reflection | 2.444 | 6 | .407 | 3.516 | .005* | .254 |
| Student Status | Reflection | 2.473 | 5 | .495 | 4.355 | .002* | .257 |
| Gender | Reframing | .492 | 1 | .492 | 4.752 | .033* | .065 |
| Age | Reframing | 1.397 | 6 | .233 | 2.392 | .038* | .186 |
| Mother Education | Reframing | .661 | 6 | .110 | 1.010 | .427 | .083 |
| Father Education | Reframing | 1.443 | 6 | .240 | 2.488 | .032* | .192 |
| Student Status | Reframing | 1.801 | 5 | .360 | 4.024 | .003* | .239 |
| Gender | Systems Thinking | .915 | 1 | .915 | 6.493 | .013* | .088 |
| Age | Systems Thinking | 1.512 | 6 | .252 | 1.766 | .121 | .146 |
| Mother Education | Systems Thinking | .576 | 6 | .259 | 1.877 | .108 | .150 |
| Father Education | Systems Thinking | 2.265 | 6 | .377 | 2.890 | .015* | .219 |
| Student Status | Systems Thinking | 2.422 | 5 | .484 | 3.845 | .004* | .234 |
| Gender | All STS | .670 | 1 | .670 | 7.662 | .007* | .103 |
| Age | All STS | 1.248 | 6 | .208 | 2.441 | .035* | .191 |
| Mother Education | All STS | .716 | 6 | .119 | 1.273 | .283 | .110 |
| Father Education | All STS | 1.658 | 6 | .276 | 3.517 | .005* | .254 |
| Student Status | All STS | 2.075 | 5 | .415 | 5.869 | .000* | .318 |

* $\alpha$ =.05 Significant p ≤ .05

And, for *systems thinking*, there were three statistically significant differences found. These differences were among the levels of *gender* ($p$ = .013*), *father's educational level* ($p$ = .015*), and *student status* ($p$ = .004*). Results of the Tukey HSD post-hoc tests revealed that males scored significantly higher (*M*=3.80, *SD*=.53) than females (*M*=3.57, *SD*=.22). Individuals with father's highest educational level of junior high school scored significantly higher (*M*=4.07, *SD*=.69) than individuals with father's with highest educational level of masters degree (*M*=3.49, *SD*=.23). Masters students scored significantly higher (*M*=3.99, *SD*=.57) than second-year undergraduate students (*M*=3.43, *SD*=.05).

1
2 *Comparison of Strategic Thinking Skills (STS) to Other Countries*
3
4      *How do students from Greece compare to individuals from other geographic*
5 *areas (i.e., United States, Hong Kong, Kuala Lampur, Shanghai, Borneo, Turkey*
6 *and Croatia)?*
7      To compare the STS scores for the aspiring Greek leaders to the STS scores of
8 the individuals from the other seven countries for which data was available, first a
9 total mean score and standard deviation was computed for each of the strategic
10 thinking skills—*reflection* (*M*=3.70, *SD*=.24), *systems thinking* (*M*=3.66, *SD*=.46),
11 and *reframing* (*M*=3.67, *SD*=.44). Using these figures, *z*- scores were computed
12 for standardizing scores. The following formula was used: $z=(x-\mu) / \sigma$, where $\mu$
13 was equal to the total mean score; $\sigma$ was equal to the standard deviation; and, *x*
14 was the mean score for the individual country. As seen in Table 3, the aspiring
15 Greek leaders scored higher than aspiring leaders from the other seven countries in
16 only three areas. Aspiring leaders from Greece scored higher in *systems thinking*
17 (*M*=3.54) than leaders from Hong Kong (*M*=3.53) and leaders from Shanghai
18 (*M*=3.01). And, aspiring Greek leaders scored higher (*M*=3.66) than leaders from
19 Turkey (*M*=3.63) in *reframing*.
20
21 **Table 3:** *Comparison of Use of Strategic Thinking Skills by Country*

|  | Reflection | | | | Systems Thinking | | | | Reframing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | N | M | SD | z-score | N | M | SD | z-score | N | M | SD | z-score |
| Greece | 69 | 3.57 | 0.38 | -0.54 | 69 | 3.54 | 0.33 | -0.26 | 69 | 3.66 | 0.39 | -0.02 |
| Borneo | 59 | 4.00 | 0.65 | +1.26 | 59 | 3.90 | 0.51 | +0.52 | 59 | -- | -- | -- |
| Croatia | 136 | 3.95 | 0.56 | +1.07 | 136 | 4.05 | 0.46 | +0.85 | 136 | 3.72 | 0.46 | +0.11 |
| Hong Kong | 102 | 3.70 | 0.51 | 0.00 | 102 | 3.53 | 0.47 | -0.28 | 102 | -- | -- | -- |
| Kuala Lampur | 52 | 3.78 | 0.54 | +0.31 | 52 | 3.66 | 0.50 | 0.00 | 52 | -- | -- | -- |
| Shanghai | 51 | 3.09 | 0.49 | -0.25 | 51 | 3.01 | 0.41 | -1.41 | 51 | -- | -- | -- |
| Turkey | 199 | 3.73 | 0.47 | +0.12 | 199 | 3.71 | 0.51 | +0.11 | 199 | 3.63 | 0.48 | -0.09 |
| United States | 64 | 3.85 | 0.58 | +0.64 | 64 | 3.85 | 0.46 | +0.41 | 64 | -- | -- | -- |
| TOTAL MEAN |  | 3.70 | 0.24 |  |  | 3.66 | 0.46 |  |  | 3.67 | 0.44 |  |

22
23
24 **Discussion**
25
26      Leaders today are faced with developing a new leadership framework. The
27 postmodern reality requires leaders who can understand their strategic context and
28 remain confident, competent and flexible in order to adapt their organizations. In
29 these environments the leader's (a) ability to influence is as important as his or her
30 position, (b) conceptual ability is indispensable in recognizing interdependencies,
31 interrelationships and patterns, (c) ability to make consequential decisions requires
32 both powers of analysis and intuition, and (d) communication and mediating skills

1 are crucial. The new leadership framework requires leaders to shift the balance
2 from C² (command and control) toward C² (coordination and collaboration) in
3 practicing their craft (Pisapia, 2009). Furthermore, Pisapia notes, these features of
4 the strategic mindset should reside not only in executive leaders but also
5 managerial leaders.
6
7 <u>Gender</u>
8
9     The possible impact of gender on *reflection*, *reframing*, and *systems thinking*
10 usage scores was analyzed by comparing the differences in mean scores between
11 male and female respondents. Females totaled 60.1% of the group (*n*=41 versus
12 *n*=28). As seen in Table 1, a comparison of the female and male participants' mean
13 scores indicates that males reported higher mean scores on *reflection*, *reframing*,
14 and *systems thinking* usage than females. Results of the ANOVAs in Table 2
15 indicate that all differences were statistically significant. This finding is consistent
16 with the Pisapia, Pang, Hee, Lin, and Morris (2009) study comparing Hong Kong,
17 Malaysia, Shanghai and the U.S. aspiring school leaders.
18
19 <u>Age</u>
20
21     As seen in Table 1, the means for total Strategic Thinking Skills (STS) rise as
22 age increases. This finding is also consistent the Pisapia, et al. (2009) study. The
23 use of these skills improves with age and experience. Also, the younger you are,
24 the less you use these skills. Mean scores for *total STS* for study participants by
25 age were: 18 years (*M*=3.17), 19 years (*M*=3.47, *SD*=.21), 20 years (*M*=3.49,
26 *SD*=.22), 21 years (*M*=3.53, SD=.12), 22 years (*M*=3.55, *SD*=.19), 23 years
27 (*M*=3.79, *SD*=.46), and 24 years and older (*M*=3.79, *SD*=.46).
28
29 <u>Parents' Educational Level</u>
30
31     Consistent with the findings of Spera, Wentzel, and Matto (2009) and Dubow,
32 Boxer and Huesmann (2009), parental educational level revealed to be a
33 significant predictor of children's education attainment and achievement. In this
34 study, however, only father's education level showed a significant impact on STS
35 usage. Participants with father's highest educational level of junior high school
36 scored significantly higher in *systems thinking* usage (*M*=4.07, *SD*=.69) than
37 individuals with father's with highest educational level of masters degree
38 (*M*=3.49, *SD*=.23). Similarly, individuals with father's highest educational level of
39 junior high school scored significantly higher in *reframing* usage (*M*=3.79,
40 *SD*=.56) than individuals with father's with highest educational level of doctoral
41 degree (*M*=3.15, *SD*=.25). And, individuals with father's highest educational level
42 of junior high school scored significantly higher in *reflecting* usage (*M*=3.79,
43 *SD*=.56) than individuals with father's with highest educational level of doctoral
44 degree (*M*=3.72, *SD*=.38).

<u>Student Status</u>

The status of the student, or their current educational level (i.e., graduate student or undergraduate student) was found to be associated with higher usage levels of STS. Undergraduate students' level of STS usage ($M$=3.48, $SD$=.31) was considerably lower that graduate students' level of STS usage ($M$=3.90, $SD$=.45). This finding is consistent with the research conducted by Penny (2010) on National Executive Fire Chiefs in the U.S.

*Recommendations*

As Steptoe-Warren, Howet, and Hume (2011) conclude, "The aim of strategic thinking and decision making is to ensure survival of the organization in a competitive marketplace. For this to occur there is a need for effective strategic thinking and decision making that steers the organization in the most appropriate direction" (p. 246). Leaders need to be trained differently. Strategic thinking allows leaders to build a reservoir of insights and intuition that they can depend on when faced with ambiguity, complexity, and dilemmas. Today, leaders must understand that their organizations are in constant development and position themselves to learn continuously from the environment while seeking a competitive advantage. However, because the environment is constantly changing, leaders must continually and consistently rethink, revise, and restructure the organization. Strategic leaders use information gathered during the processes of reflection, reframing, and systems thinking to make sense out of situations. By capitalizing on the findings of this study, organizations and higher education institutions may better prepare today's leaders.

Bowman (2016) suggests specific steps that leaders can take to assist them in being more strategic in their current roles. By focusing on developing four key abilities, leaders may demonstrate and enhance their strategic thinking potential. First, in order to be strategic, leaders need to observe and seek trends. For example, leaders must pay attention to issues that get raised over and over again and be proactive and share findings. Next, they need to be curious and look at information from different points of view. In doing so, one will be able to clearly see different possibilities, approaches, and potential outcomes. Third, strategic thinkers know how to prioritize and sequence their thoughts (i.e., group and logically order main ideas. Finally, they need to make time for thinking and embrace conflict.

*Conclusions*

In summation, being more strategic requires only that the leader put the smallest decision in the context of the organization's broader goals. For example, nurturing a relationship, such as one that could provide unique insight into a

connection, a supplier, a customer, or a competitor is highly strategic. As Davey (2014) asserts, "Everyone has an opportunity to think more strategically" (pg. 1). Successful and effective leaders seek sustainable advantage. Liedtka (2000) states that the field of strategy has been basically concerned with the search sustainable competitive advantage and as the pace of change in the business environment accelerates, this focus translates into a strategy process concerned with equipping organizations with the capability to deal successfully with this changing environment (Liedka 2000).

Rather than focus on current phenomenon, the leaders must hone in on challenges, such as (a) the rate of speed of change; (b) the influx of amount of data in the present environment—in the present environment we are all drowning in data; (c) the exponential growth rate of knowledge and information; and (d) the need to increase the rigor on how decisions are made, which will require executives to learn new set of conceptual skills to help make sense of it all. Moreover, today's leaders are expected to be more successful with fewer resources. Opportunities and needs are constantly changing around us; however, the fundamental principles of strategy never change. We see this in the most important principle by Sun Tzu learned by all—that all plans are temporary and can become outdated as soon as they have been created. Sun Tzu knew thousands of years ago that strategy required rapid, thoughtful responses based on sound judgment and principles.

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1
2
3   **Appendix A**
4   THE STRATEGIC THINKING QUESTIONNAIRE
5
6
7   When faced with a conflict or problem, how often do you….
8

| Rank | Item | Reframing            (M=3.54, SD=.23) | M | SD |
|---|---|---|---|---|
| 7 | 1 | Seek different perceptions? | 4.21 | .63 |
| 40 | 4 | Track trends by asking everyone if they notice changes in the organization's context. | 3.46 | 1.03 |
| 36 | 7 | Ask those around you what they think is changing? | 3.68 | .81 |
| 42 | 10 | Discuss the situation only with people who share your beliefs? | 2.87 | 1.18 |
| 17 | 13 | Engage in discussions with those whose values differ from yours? | 4.01 | .82 |
| 34 | 16 | Use different viewpoints to map out strategies? | 3.73 | .96 |
| 38 | 19 | Recognize when information is being presented from only one perspective? | 3.55 | .92 |
| 39 | 27 | Can you recognize when information is presented from only one perspective? | 3.54 | 1.01 |
| 44 | 30 | Decide upon a point of view before seeking a solution to a problem? ® | 2.66 | 1.03 |
| 37 | 33 | Use different points of view to map out different strategies? | 3.62 | .93 |
| 6 | 36 | Listen to everyone's version of what happened before making a decision? | 4.21 | .88 |
| 46 | 39 | Find only one explanation for the way things work? ® | 2.32 | .94 |
| 10 | 42 | Engage in discussions with those who have different beliefs or assumptions about a situation? | 4.11 | .57 |
| 41 | 45 | Create a plan to solve a problem, before considering other viewpoints? ® | 3.13 | 1.13 |
| 21 | 51 | How often do you think of what is interesting, unique, beautiful or unusual about this situation? | 3.86 | .92 |
| 28 | 52 | How often to you think about questions you are neglecting to ask? | 3.79 | 1.04 |
|  |  | *Reflecting*       (M=3.58, SD=.37) | *3.58* | *.37* |
| 14 | 2 | Review the outcomes of past decisions? | 4.08 | .84 |
| 23 | 5 | Reconstruct an experience in your mind? | 3.86 | 1.02 |
| 11 | 8 | Consider how you could have handled the situation after it was resolved? | 4.11 | .82 |
| 33 | 11 | Accept that your assumptions could be wrong? | 3.75 | .73 |
| 25 | 14 | Acknowledge the limitations of your own perspective? | 3.85 | .75 |
| 8 | 17 | Consider the effect of past actions in similar situations? | 4.17 | .81 |
| 52 | 20 | Ask "WHY" questions when trying to solve a problem? | 1.83 | 1.00 |
| 2 | 23 | Set aside specific periods of time to think about why you succeeded or failed? | 4.44 | .84 |
| 30 | 25 | Try to understand the way the problem worked out after it was solved? | 3.76 | .80 |

| 51 | 28 | Ignore past decisions when considering current similar situations? ® | 2.14 | .52 |
|---|---|---|---|---|
| 49 | 31 | Frame problems from different perspectives? | 2.15 | 1.09 |
| 1 | 34 | Think about the results of your actions? | 4.54 | .63 |
| 19 | 37 | Connect current problems to your own personal experience and previous successes? | 3.99 | .97 |
| 47 | 40 | Ignore your past experiences when trying to understand present situations? ® | 2.27 | 1.12 |
| 24 | 43 | Stop and think about why you succeeded or failed? | 3.85 | 1.09 |
| 22 | 46 | Reconstruct an experience in your mind to understand your feelings about it? | 3.86 | .99 |
| 31 | 48 | Take into account the effects of decisions others have made in similar situations? | 3.76 | .94 |
| 20 | 49 | How often do you listen to your intuition? | 3.94 | .86 |
| *Rank* | *Item* | *Systems Thinking   (M=3.66, SD=.39)* | *M* | *SD* |
| 26 | 3 | Try to extract rules and/or patterns from the information available? | 3.83 | .81 |
| 3 | 6 | Try to find a common goal when two or more parties are in conflict? | 4.32 | .79 |
| 9 | 9 | Find that in most cases external changes require internal changes? | 4.15 | .79 |
| 13 | 12 | Search for the cause before taking action? | 4.08 | .82 |
| 45 | 15 | Include everyone affected when creating a policy? | 2.62 | 1.02 |
| 12 | 18 | Find that one thing indirectly leads to another? | 4.10 | .64 |
| 43 | 21 | View individuals as being independent from an interwoven network? ® | 2.72 | .99 |
| 4 | 22 | Try to understand how the facts presented in a problem are related to each other? | 4.25 | .65 |
| 50 | 24 | Try to identify external forces which affect your work? | 2.18 | 1.03 |
| 15 | 26 | Try to understand how the people in the situation are connected to each other? | 4.08 | .84 |
| 29 | 29 | Investigate the actions being taken to correct the discrepancy between what is desired and what exists? | 3.77 | .83 |
| 27 | 32 | Look for fundamental long-term corrective measures? | 3.82 | .95 |
| 48 | 35 | Look for changes in the organization's structure that lead to significant enduring improvement? | 2.21 | 1.05 |
| 5 | 38 | Look at the 'Big Picture' in the information available before examining the details? | 4.24 | .77 |
| 32 | 41 | Seek specific feedback on your organization's performance? | 3.76 | .94 |
| 18 | 44 | Think about how different parts of the organization influence the way things are done? | 4.00 | .70 |
| 35 | 47 | Define the entire problem before breaking it down into parts? | 3.72 | .97 |
| 16 | 50 | Ask yourself how the "dots" connect in this situation? | 4.01 | .75 |

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