The Relationship between Students' Thinking Styles and Professional Skepticism

Aistè Urbonienè*, Medhat Endrawes**& Kenan Matawie***

*Department of Philosophy and Culture Studies,Vilnius University Kaunas Faculty of Humanities, Lithuania, Email - aiste.urboniene@khf.vu.lt
**Lecturer in Auditing/Accounting, Department of Accounting & Corporate Governance, Faculty of Business and Economics, Australia. Email: medhat.endrawes@mq.edu.au
***Senior Lecturer, School of Computing, Engineering and Mathematics, University of Western Sydney, Australia. Email: k.matawie@uws.edu.au

Abstract

The current study investigates the relationship between professional skepticism and students' thinking styles in Lithuania. One hundered and nine (109) business majors (management and business adminstration) and other majors (Philology and Advertising) students were surveyed. Sternberg et al. (2007) Inventory Revised II was completed by participants to identify their type I (creativity-generating) and type II (norm-favouring) thinking styles to test the relationship. Hurtt's (2010) scale was used to measure professional skepticism. The results show that type II (norm-favoring) thinking styles are associated with professional skepticism. In addition, there was no difference between business students and students with other majors with respect to professional skepticism. To our knowledge, it is the first study that tests the relationship between professional skepticism and thinking styles using business students and students with other majors in Lithuania.

Keywords: professional skepticism, thinking styles, business and other students' majors, Lithuania.

I.   Introduction

In the global and constantly changing business world, it is important that professionals act flexibly and think effectively. Effective thinking is a key to management success leading to innovations and creative solutions (Smith, 2003). A number of thinking styles have been identified, and any individual will use a mixture of styles depending on the circumstances. However, each individual will have a style or styles which they draw upon more often than the other styles. Arguably, effective thinking includes critical thinking and professional skepticism that help problem-solving, in decision-making and in avoiding crisis situations in work places. According to Ennis (1993), critical thinking is connected to creative aspects and as conceiving of alternatives, formulating hypotheses and definitions, and developing plans.   As Beyer (1995) has observed there are authors that evaluate skepticism as an integral part of critical thinking. He underlines that a good critical thinker should be disposed to skepticism as well as to questioning accuracy, authenticity, plausibility, and so on. Also, Johnson (2003, p. 15) makes an assumption that "more knowledge of science makes for better critical thinking and thinking styles and therefore more skepticism". Professional skepticism is defined as "a doubting or questioning attitude or state of mind" (The American Heritage Dictionary of the English Language, 2009). This means that a skeptical individual is reluctant to accept something as factual without evidence, without suspicious thought, and critical assessment of all information. Professional skepticism, by definition, is an attitude and a style that includes a questioning mind, cautious in adopting beliefs and making critical assessment of all evidences. Overuse of professional skepticism, however, could lead to distrust, while underuse could lead to problems such as bad decisions and even business collapse. Suitable levels of professional skepticism may produce high-quality decisions.

It has been recognized that professional skepticism is influenced by an individual's competence level such as knowledge. In turn this knowledge is influenced by the type and amount of education and training to which the individual has been exposed. Dominant teaching and learning styles can be influenced by both the culture of the country and the discipline being studied (Rutz et al., 2003).

Noneless, acquiring knowledge in a certain study field and obtaining an academic degree provides an opportunity for mastering effective thinking skills. Thus, there is considerable value in teaching business students and students with other majors how to think effectively and make decisions. However, teaching students critical thinking skills is a long and complicated process (Van Gelder, 2005) that requires that lecturers understand how to impart such skills. The current study is different from prior research because it is the first study that empirically investigates the relationship between students' thinking styles and professional skepticism. This is important because it is argued that in addition to drawing on appropriate thinking styles, there is a need for experts to exercise professional skepticism in their jobs. Thus, studying the relationship between professional skepticism and thinking styles is useful for both universities and organizations.

Lithuania is used because it represents a collectivism culture, according to Hofstede (1991) and it is important to know which thinking styles are preferred by students in Lithuania as this should be taken into account when designing approaches to education. In addition, if students are being prepared for an occupation where a particular learning style is important, then this will indicate the deficit (if any) which needs to be overcome.

This paper aims to identify and compare the relationship between students' thinking styles and professional skepticism among students in two different disciplines in a Lithuanian University.

Thinking Styles

Thinking styles are part of intellectual styles (Zhang & Sternberg, 2006). Thinking styles are defined as the favorites in using one's capabilities (Zhang & Sternberg, 2006). Sternberg (1997) called it "mental self-government" because there are diverse methods of governing a society and there are different methods by which a person desires to use his/her capabilities. Therefore, individuals tend to conduct their daily work by choosing the styles which they prefer and with which they are comfortable. It is likely individuals' thinking styles interact with the task and the environment under which it is performed. Sternberg (1997)

states that thinking styles can be refined and changed. Mental self-government theory has been considered in this study as it the most frequently used Thinking Styles Inventory (Zhang, 2010). In addition, the theory has been proved internal valid in prior research.

Thinking styles have been examined among teachers and students. Some research has focused on teachers' styles and expectations of students (Saracho, 1991). Other research has tested the relations of teachers' styles and students' achievement (Tymms & Gallacher, 1995) and students' socialization (e.g., Webb, 1988).

Prior research also examines teachers' styles and students' thinking styles (Zhang, 2009). Teaching styles were related to thinking styles according to Zhang (2009). Students thinking styles were related to their individual characteristics and their learning environments (Grigorenko & Sternberg, 1997), and to their academic performance (Zhang & Sternberg, 1998). Zhang (2001) finds that thinking styles are related to academic performance; however, there is no positive relationship between creativity thinking styles and academic performance.

Teachers' characteristics such as age and gender impact on their teaching styles (Zhang & Sternberg, 2002). Academic discipline is an important factor as it moderates the relationship between student-teacher style match and students' performance (Zhang, 2006).

Sternberg identifies 13 thinking styles which are grouped into five dimensions: functions, forms, levels, scopes and leanings. Zhang and Sternberg (2006) reduced the 13 thinking styles into three types. Type I thinking styles (high levels of cognitive complexity – creativity-generating) which includes legislative (being creative), judicial (evaluative of other people or products), hierarchical (prioritizing one's tasks – a sense of order), global (focusing on the holistic picture), and liberal (taking new approaches to tasks).

Type II thinking styles (lower levels of cognitive complexity – norm-favoring) which include executive (implementing tasks with prescribed procedures and respect for authority), local (focusing on concrete and discrete details), monarchic (working on one task at a time), and conservative (using

traditional approaches to tasks – require conformity).

Type III thinking styles embody the anarchic (working on whatever tasks that come along), oligarchic (working on multiple tasks with no priority), internal (working on one's own), and external (working with others). The current study uses type I and type II thinking styles, arguably because they probably relate to professional skepticism as they are require high levels of cognitive thinking and problem-solving skills.

Zhang (2001) argues that type I thinking styles are regarded more effective than the type II and type III because they enable students to solve problems by using creativity. The current study suggests that students with type I and type II thinking styles are likely to score high on skepticism.

II.   Professional skepticism

Indeed, thinking requires similar skills such as critical assessment, evidence evaluation, and making complex decisions. Both thinking styles and professional skepticism are required problem-solving skills.

However, these skills may different from one person to another and from culture to culture because of the differences in education systems and learning styles. Learning styles "refers to the consistent way in which a leaner responds to or interacts with stimuli in the learning context" (Loo, 2010, p. 252). Students' learning styles and preferred teaching/learning methods are influenced by gender and age (Zhang, 2001). Motivation to learn and attitudes towards learning are arguably influenced by culture as well. For example, a collectivist culture such as in Lithuania, suggests that most prefer the informative way of learning, based on being the receiver of information (Redding, 1980). They prefer a teaching style which consists of lectures followed by examinations on the content taught as the model of learning (Rutz et al., 2003). On the other hand, in individualistic cultures, such as Australia, students are encouraged to use critical thinking and problem-solving in their learning (Rutz et al., 2003).

In addition, professional skepticism may differ between majors. Business major students are aware of corporate collapses that have taken place in the last 10 years, and such issues are an important part of their curriculum development. This may make them more skeptical than students in other student majors and, therefore, they may have higher/ different thinking styles. Problem solving and professional skepticism are related (Nelson, 2009) because they are complex, non-routine, and require cognitive complexity (Rixom, 2010).

This suggests that a higher level of thinking styles I & II could lead to high professional skepticism. Thus, the following hypotheses were developed:

H1: There is a positive relationship between thinking style type I and professional skepticism.

H2: There is a positive relationship between thinking style type II and professional skepticism.

Based on Zhang (2001), older students are more likely to be classified as thinking style type I because they are more judicial. The business literature reports some elements that may affect the level of professional skepticism such as work experience (Shaub & Lawrence, 1999; Carpenter et al., 2002; Payne & Ramsay, 2005);

In addition, it has been reported that inexperienced accountants are more skeptical in thought and behaviour than experienced accountants (Shaub & Lawrence, 1999; Carpenter et al. 2002; Payne & Ramsay, 2005). This may be because experienced accountants have the knowledge that increases their self-confidence and decreases their skepticism. Alternatively it may be that the audit firm cultures are incompatible with high as opposed to moderate levels of scepticism.

H3: There is a significant relationship between the age of students and their level of professional skepticism.

Over the past decade in Australia, Europe, and the United States (US), the accounting and auditing profession, users of financial statements and governments have expressed concern about corporate collapses around the world. In 1980, there was a call for more effective ways to detect material misstatements that related to fraud (e.g., Romney et al., 1980) and errors (Asare

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& Davidson, 1995). In the past few years, there have been many events suggesting the importance of detecting fraud such as the introduction of the international auditing standards (IAS 99) and the Australian Auditing Standards (ASA 240). These events have included an unprecedented level of corporate collapses during the close of the 20th century and the early part of the 21st century, e.g., Enron, Waste Management, WorldCom, Royal Ahold, and Parmalat. As a consequence, business major students are likely to be more skeptical than students in other majors due to their knowledge of such events, and their thinking styles may be different.

H4: Business students' majors are likely more skeptical than students with other majors.

III. Research Design

Participants

In total, 109 first-year undergraduate students from Vilnius University participated in the current study. Fifty-five students were recruited from the Lithuanian Philology and Advertising study program and 54 students studying management and business administration study program. Ninety-one participants were female, and 18 were male. The participants were from bachelor studies. The participants' ages ranged from 20 to 24. All participants were Lithuanian except three respondents: one Polish, one Russian, and one Latvian.

Data collection

The data were collected in February 2012. An associate professor at Vilnius University explained the objectives of the study to all participants. The participants were undertaking their lectures. The participants are enrolling in business degrees and other degrees. The authors and the professors collected the data in the lecture rooms at the conclusion of the lectures. The participants were asked to fill out a survey. It is consistent of three parts. Part one is related to thinking styles, part two measures professional scepticism, and part three is related to demographic data. The participants spent 20-30 minutes to complete the survey. In the beginning the students were informed about the purpose of the survey and asked to complete the survey individually. All participants were volunteers. In the current study, the survey was administered in the Lithuanian language.

Measures

There are two independent variables (thinking styles and students majors/ business and other majors' students). The dependent variable is professional scepticism. Thinking styles has two levels (type I and type II) using business students (management and business adminstration) and students with other majors (Philology and Advertising). Hurtt's (2010) scales were used to measure professional skepticism. To measure professional skepticism, participants were required to assess the agreement on 30 statements and rate it on a scale of 1 (strongly disagree) to 6 (strongly agree). Three sample items are: "I do not feel sure of myself","I am confident of my abilities", "I take my time when making decisions".

Thinking styles are measured using Inventory Revised II (Sternberg et al., 2007). This measure has been used widely in the literature. The participants rated themselves on a seven-point Likert scale, with 1 indicating that the statement does not at all represent the way they normally carry out their tasks, and seven denoting that the statement characterizes extremely well the way they normally carry out their tasks. Three sample items are: "I like tasks that allow me to do things my own way (legislative style)", "I tend to pay little attention to details (global style)", "I like problems where I need to pay attention to details (local style)".

Limitations

The study has several limitations. First, as there is a lack of other empirical studies inspecting the association between thinking styles and professional skepticism with similar constructs, the generalization of the results need to be verified further with other populations. Second, the current study used surveys to examine the influence of the independent variables on the dependent variable in Lithuania. Therefore, the results of the current study cannot be generalized to all students, organizations, and cultures. Future research concerning participants from other educational and cultural settings can reinforce understanding about the relationship between thinking styles and professional skepticism.

Regardless of the limitations, this study has made contributions in the area of professional skepticism and thinking styles. The current study provides empirical evidence for the relationship between professional skepticism and thinking styles.

IV.   Results

Table 1 shows descriptive data for the three core variables. The descriptive statistics for these three core demographic variables (gender, age, education, and business/other student majors) are given in table 1. The participants consist of fifty five (50.46%) business students and fifty four (49.54%) students in other majors. The participants (51 students) predominantly have 13 years of education (46.79%). Fifty-eight (53.21%) of participants are under the age of 20 and fifty-one (46.79%) are between 20-40 years old.

Table 1 - Demographic Statistics

	Frequency	Percent
Major*		
Business	55	50.46
Other	54	49.54
Total	109	100.00
Education		
12 years	31	28.44
13 years	51	46.79
14 years	14	12.84
15 years	13	11.93
Total	109	100.00
Age		
Under 20	58	53.21
20-24	51	46.79
Total	109	100.00
Gender		
Male	18	16.51
Female	91	83.49
Total	109	100.0
Majors refer to academic majors (business versus other)		

Table 2 provides the means and standard deviations for professional skepticism of participants for thinking style 1 and thinking style II. Table 3 indicate that professional skepticism is mainly higher for thinking style 1. In general, professional skepticism is higher for females than males and older age is more skeptical than younger age. Professional skepticism is examined in details using ANOVA reported in Table 3. An Analysis of variance (ANOVA) is used to test the hypotheses. ANOVA is used to test the effect of independent variables on the dependent variables. A t-test is also used to detect differences in mean scores on professional skepticism.

Table 2 - Descriptive Statistics of mean (standard deviation)

	Skepticism		Style 1		Style 2	
	Mean	SD	Mean	SD	Mean	SD
Major						
Business	112.1	(11.8)	41.3	(4.9)	39.9	(4.4)
Other	108.9	(12.0)	41.3	(4.1)	38.9	(5.6)
Education						
12 years	110.3	(10.8)	40.9	(4.9)	39.6	(5.7)
13 years	108.4	(14.0)	41.2	(4.2)	39.0	(5.3)
14 years	112.9	(10.7)	43.5	(5.1)	39.2	(5.8)
15 years	112.8	(6.5)	40.2	(3.9)	39.2	(6.0)
Age						
Under 20	107.7	(13.1)	40.9	(4.6)	39.0	(5.9)
20-24	113.7	(9.7)	41.7	(4.5)	39.5	(5.0)
Gender						
Male	110.7	(11.3)	40.4	(4.3)	37.9	(6.2)
Female	113.7	(12.0)	41.5	(4.6)	39.5	(1.09)
Overall	110.5	(12.0)	41.3	(4.5)	39.2	(5.5)

Response scales for professional skepticism ranged from 1 to 6 (where 1 refers to strongly disagree and 6 to strongly agree).

Hypothesis 1 states that there is a positive relationship between thinking style type I and professional skepticism. ANOVA shows no significant relationship between thinking style type I and professional skepticism ($F = 1.77$, $p = 0.186$). The result indicates that professional skepticism does not require higher levels of cognitive complexity or creativity. Individuals who are willing to take new approaches do not necessarily have a high level of skepticism. These individuals may be risk takers and therefore are not necessarily skeptical.

Hypothesis 2 states that there is a positive relationship between thinking style type II and professional skepticism. The result confirms the hypothesis. There is a significant relationship between thinking style type II and professional skepticism ($F = 7.55$, $p = 0.007$). Individuals with lower cognitive complexity are likely to be skeptical. There are possible reasons for such a result. First, students are likely to perform tasks according to the prescribed procedures (excusive). Secondly, they focus on details (local) and thirdly, they are conservative.

Hypothesis 3 states that there is a significant relationship between the person's age and their professional skepticism. The result confirms the hypothesis. There is a significant relationship between the age and professional skepticism ($F = 5.00$, $p = 0.028$). This suggests that older students have different knowledge and experience than younger students and, therefore, different levels of skepticism.

Table 3 - Results of ANOVA - Dependent: Professional skepticism

Source	Df	SS	MS	F	Sig
Style1	1	223.4	223.4	1.77	0.186
Style 2	1	961.4	961.4	7.55	0.007***
Age	1	636.8	636.8	5.00	0.028**
Gender	1	5.9	5.9	.05	0.831
Major	1	4.1	4.1	0.03	0.857
Education	3	95.0	31.7	0.25	0.862
*** Statistically significant (1% level, one-tailed). ** Statistically significant (5% level, one-tailed).					

Hypothesis 4 states that business majors will differ from other majors with respect to professional skepticism and thinking styles.

T-test shows that there is no significant differences between business and other majors students ($T = 1.37$, $p = 0.173$). One possible explanation is that other majors are also aware of corporate collapses and therefore they have similar levels of skepticism as business

students. This indicates that professional skepticism was not course specific in this case. Further analysis reveals that there is no gender effect. Both males and females have similar levels of skepticism.

V. Discussion and conclusion

The primary objective of the current study was to investigate the relationship between professional skepticism and thinking styles. A second goal of the current study was to test whether there are significant differences between business majors and students with other majors regarding professional skepticism. Using students from Lithuania, the results show that there is a positive relationship between students' thinking style II and professional skepticism. That is, students who are skeptical are more likely to have different thinking styles.

The result indicates that professional skepticism is not requiring higher levels of cognitive complexity or creativity but rather lower levels of cognitive complexity and conservative thinking. There are no significant differences between business students and students with other majors with respect to professional skepticism. The results of the present study identified a unique contribution of thinking styles to students' professional skepticism.

The results of the study have implications for learning and teaching, professional bodies, and potential employers. In order for students to be successful in the world of work, students should have a reasonable level of skepticism with a variety of thinking styles, especially thinking styles II. How schools and universities should prepare students to be skeptical and participate in complex decision making is a challenge for educational organizations at all levels.

Indeed, understanding the circumstances for skeptical thinking can benefit schools and universities if proper polices in place for developing students' critical and skeptical thinking. Currently, there is a thoughtful interest in encouraging critical thinking and skeptical views in education. The results of the current study can provide suggestions to educators of what types of thinking styles need to be fostered and cultivated in order to develop and foster skeptical thinking of students. For example,

thinking styles II (lower level of cognitive complexity) of individuals may be helpful to promote students' skeptical thinking.

From this study, the study shows that professional skepticism did not require higher levels of cognitive complexity but rather lower levels of cognitive complexity. Furthermore, there were no differences between business majors and students with other majors with respect to professional skepticism.

The study provides a first step in an investigation that will be further examined in future research. The extension of the present study to another culture and other occupations will be useful venues for future research. And then a comparison could be made between the result of this study and other future studies. The current study contributes to the literature and we hope educators can develop teaching strategies that can encourage reasonable sceptical thinking.

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"An expert is one who knows more and more about less and less until he knows absolutely everything about nothing."

— Nicholas Murray Butler