Relationship among the Verbal Competence, Self-Regulated Learning Strategies, and Professional Interests

Margita Mesárošová a*****, University of Pavol Jozef Šafárik, Moyzesova 9, Košice 040 01, Slovakia & Research Institute of ICT in Construction Sector, Garbiarska 5, Košice 040 01, Slovakia

Abstract

Problem Statement: The starting point is an empirical observation that students who have clear-cut professional interests also have higher self-regulated learning strategies and study achievement. Purpose of Study: The aim of the study was to examine relationship existing between self-regulatory learning strategies and professional interests of students and find out whether the use of regulatory learning strategies depends on the level of verbal competence and professional interests. *Methods:* One hundred and twenty high school (17-19 year old) and university students (20-24 year old), 50 % were female, completed Graduate and Managerial Assessment (Blinkhorn, 1985), Metacognitive Awareness Questionnaire (Schraw & Dennison, 1994) and Interests Questionnaire (Guide to the World of Professions) to assess their verbal competence, self-regulated learning strategies and professional interests. Correlation analysis and regression analysis were used to reveal the relationship among studied variables. *Findings and Results*: Correlation analysis proved significant correlations among the level of verbal competence and regulation of learning, as well as the professional interests focused on organizational and managerial activities, and scientific interests. Metacognitive knowledge is significantly associated with scientific interest with information and helping people activities. Regulation of metacognitions is positively linked to interests in organizational and managerial activities and helping people activities. As predictors of self-regulated learning strategies were confirmed the level of verbal competence, professional interests focused on organizational and managerial activities, scientific interests, and helping people activities. *Conclusions and Recommendations*: Study revealed important association among verbal competence, self-regulated learning strategies, and professional interests. This finding can be used in academic and career counselling.

Keywords: Verbal competency; metacognitive awareness; self-regulated learning; professional interests;

* ADDRESS FOR CORRESPONDENCE: **Margita, Mesárošová**, Pavol Jozef Šafárik University, Moyzesova 9, Košice 040 01, Slovakia
E-mail address: margita.mesarosova@upjs.sk / Tel.: +421-55-234-7163

1. Introduction

The starting point is an empirical observation that students who have clear-cut professional interests also have higher self-regulated learning strategies and study achievement. The aim of the study was to examine relationship existing between self-regulatory learning strategies and professional interests of students and find out whether the use of regulatory learning strategies depends on the level of verbal competence and professional interests and vice versa. This study was prompted by other researches, such as Rychen & Salganik (2003), Mesarosova & Mesaros, 2011), Mesaros & Mesarosova (2012), Mesarosova, Mesaros & Mesaros (2012) and Mesaros, Mesarosova, & Mesarosova (2012).

There are some research results concerning the relationship among cognitive abilities and metacognitive strategies. As stated by Carr, Alexander and Schwanenflugel (1996), existing research comparing the metacognitive skills of high ability and average students did not support consistently this idea. High ability students showed better performance in some aspects of metacognition, such as a higher degree of metacognitive knowledge and the ability to transfer these strategies to situations different from those in which they learned these strategies. Gifted students, compared with the average students generally have more developed declarative metacognitive skills and greater ability to transfer the strategies to other situations. Shore (2000) proved that gifted children differ from their peers in the use of problem solving strategies, as well as the speed and fluidity with which they are applied. On the other hand, they did not show the use of more advanced strategies, stamina and monitoring cognitions.

1.1. Verbal competency

Verbal abilities/competencies are not unitary constructs. Concept of verbal abilities can be applied to all the components of language usage, including skills like word fluency, grammar, spelling, reading, vocabulary, verbal analogies, and language comprehension. Items used to assess verbal abilities include tasks such as searching for the words with the same meaning, solving verbal analogies, reading comprehension tasks, simple grammar questions, and writing in response to prompts or other instructions.

1.2. Metacognition

Metacognition or metacognitive awareness is an essential element in academic literacy; it involves self-regulated learning through evaluating, monitoring, and planning. Most accounts of metacognition (for example, Schraw & Dennison, 1994; Pintrich & De Groot, 1990) distinguish between metacognitive knowledge and metacognitive control. Metacognitive knowledge refers to what individuals know about their own cognition or about cognition in general. Metacognitive control/regulation refers to a set of mutually interrelated metacognitive activities that help control one's thinking or learning. Cognitive and metacognitive skills are part of learning to learn skills. Cognitive and metacognitive strategies and skills are closely related in terms of them both involving cognition and skill but they are conceptually quite distinct. Both theoretical (Schraw & Moshman, 1995) and empirical accounts (Pintrich & De Groot, 1990; Schraw & Dennison, 1994) claim that metacognitive control/regulation and knowledge are intercorrelated. It means that more metacognitive knowledge leads to better regulation, while better regulation leads to the acquisition and construction of new metacognitive knowledge. There are several characteristics of cognitive learning strategies, namely they are goal-directed, intentionally invoked, and effortful and are not universally applicable, but situation specific. Metacognitive strategies appear to share most of these characteristics, with the exception of the last one, since they involve more universal application through focus upon planning for implementation, monitoring and evaluation. On the other hand, metacognitive strategies are not so situation specific but involve truly generic skills essential for adult, more sophisticated forms of thinking and problem solving.

1.3. Professional interests

The nature of interests is still not clear. The psychodynamic approach is premised on assumption that interests reflect basic unconscious needs, motives, conflicts, defence mechanisms and other concepts. Learning-based models of interests equated a study of interests with a study of motivational learning, in the context of personality development and genetic factors. The idea that individual's interests are outer expressions of motivation factor was expressed by Asch (1952). Similarly, Strong (1951) considered interests habituated activities. The determination of interests by personality needs, motivational, and learning mechanisms is too emphasized by Darley and Hagenah (1955) as Barak (2000) wrote. Holland (1997) viewed interests as one of the expressions of a personality type, as defined by his RIASEC model (R - Realistic, I - Investigative, A - Artistic, S - Social, E - Enterprising, and S - Social). In his cognitive model of interests Barak (1981, 2000) claimed that interests are emotional manifestations of cognitive processes and he regarded interests as basically emotions or feelings reflecting the degree of attraction toward an occupation, a task, an activity, or a training course, or aversion. Barak (1981) identified the cognitive determinants of interests that were derived from empirical research and theoretical considerations, namely perceived abilities, expected success and anticipated satisfaction.

2. Method

2.1. Participants

The sample consisted of 120 students. Fifty percent were high school students (17-19 year old, AM = 17.96 years; SD = 0.96) and fifty percent were university students (20-24 year old; A M =22.4 years; (SD = 1.2), 50 % were female. Of note, the database analysed in this study was part of a larger study investigating the competencies for the knowledge society of university students.

2.2. Procedures

The approval to conduct the study was received from the participating high school and universities. Students were not paid for participation. In groups of approximately 20 to 30, students who assented to participate completed the measures described below and a brief demographic questionnaire. The manuscript author and additional research assistant were on hand throughout the administration of the tests and inventory to assist students with questions and to check for response errors. One session lasting approximately 60 minutes was held for direct measuring verbal competency, self-regulated learning strategies (metacognitive awareness) and professional interests.

2.3. Measures

Students completed Graduate and Managerial Assessment, Verbal Form (Blinkhorn, 1985), Metacognitive Awareness Questionnaire (Schraw & Dennison, 1994) and Interests Inventory (Guide to the World of Professions) to assess their verbal competence, self-regulated learning strategies and professional interests.

Graduate and Managerial Assessment (Blinkhorn 1985) is a standardized measure intended to assess verbal, mathematical, and abstract competencies. Performance in the test does not depend on any specific knowledge. In addition to logical tasks the items on personal interests, ideas and knowledge are included. The verbal subtest was utilized in this study. The verbal competence subtest (GMA-V) is focused on the verbal understanding and critical thinking skills. The basic principle of this test is the evaluation and interpretation of written material which is often processed in a number of

jobs requiring high education levels. The verbal subtest contains 60 items. Reliability of the verbal subtest (Cronbach's alpha value) varies from 0.77 to 0.79 (Kollarik et al., 1993).

Metacognitive Awareness Questionnaire (MAI, Schraw & Dennison, 1994) Questionnaire consists of 52 items. It is the comprehensive scale assessing various facets of metacognition in two main categories: Metacognitive knowledge (declarative knowledge, procedural knowledge, and conditional knowledge) and metacognitive regulation (planning, information management strategies, monitoring, debugging strategies, and evaluation of learning). It has good reliability and validity for metacognition assessment. In original scale authors used 100- mm rating response format, in our study participants responded to each item on a 5-point scale ranging from strongly disagree (1) to strongly agree (5). Scores for each item on the MAI were summed to obtain a composite score for MAI metacognition. Cronbach's alfas for our sample were as follows: Total scale: .91; metacognitive knowledge: .81; metacognitive regulation: .87.

Interests Questionnaire (Guide to the World of Occupations; www. occupationsguide.cz) consisted of 44 short statements that express preference for a particular area of interest and profession. The task of the respondent was to mark its attractiveness to each statement item on a 5-point scale ranging from "I do not like it at all" (1) to "I really like" (5). Authors of this inventory did not provide data about standardization of inventory. By means of factor analysis (principal component analysis, varimax rotation) we extracted six factors: Administrative Interests (eight items, estimated Cronbach α was .81),Technical Interest (ten items, estimated Cronbach was α .84), Organizational and Managerial Interests (six items, estimated Cronbach α was .75), Interests in Services (six items, estimated Cronbach α was .78), Scientific Interests (six items, estimated Cronbach α was .88), and Helping People Interests (six items, estimated Cronbach α was .84).

Correlation analysis and regression analysis were used to reveal the relationship among studied variables. To determine if students in the universities differed from students in high schools in measured cognitive and metacognitive competencies, an independent samples MANOVA/ANOVA test was conducted with education status and gender as the grouping variables. Correlation coefficients were calculated to determine the relationships among cognitive competencies and the self-regulated learning (metacognitive awareness factors), as well as professional interests in these two groups of students. To determine, which competencies were most predictive of professional interests in university and high school students, data from the sample of students were subjected to a series of simultaneous multiple regression analyses. In each regression analysis, cognitive competencies and metacognitive awareness factors were entered as the predictor variables. Beta weights (standardized regression coefficients) were examined to determine the relative importance of the various predictor variables.

3. Results

3.1. Group differences in verbal competency and metacognitive awareness by education level and gender

We have revealed by MANOVA that students did not differ by education level and sex in the test of verbal competences (F = 1.306; p = .255), the mean raw score on verbal competence test for male students was 25.93, compared to a mean of 25.03 for female students. The similar results were found in metacognitive awareness competences, students did not differ by education level and sex (F = 1.331; p = .251). Students of both universities and high schools achieved comparable scores on verbal competencies (F = 0.025, p =. 875); on the other hand, they differed in metacognitive awareness due to education level (F = 3.972, p =. 048) with higher metacognitive awareness in university students. In addition, the metacognitive awareness scores differed for the groups in term of gender in favor of female students (F = 5.943, p = .016).

Scores on the metacognitive knowledge were not different for the groups in terms of study level and gender (F =.202, p = .653), study level (F = 1.093, p = .298), as well as gender (F = 1.450, p = .230).

On the other hand, students significantly differed in the level of metacognitive regulation by gender (F = 8.063, p = .005) in favor of female students, but they did not refer about different level of metacognitive regulation due to education level (F = 3.223, p = .075).

3.2. Group differences in professional interests by education level and sex

We have found by MANOVA that students did not differ by education level and sex in most of areas of professional interests. High school students reported more technical interests than university students (F = 7.993; p = .005). In addition, the technical interests scores differed for the groups in term of gender in favour of male students (F = 25.541; p = .000).

Table 1. Arithmetic Means, Standard Deviations and Correlations among Verbal Competency, Metacognitive Awareness, and Professional Interests

Variables	AM (SD)	GMA-V	MAI-K	MAI-R	AI	TI	MI	IS	SI	HI
Age	20.1 (2.41)	.148	.071	.143	-.068	-.154	-.134	-.138	-.087	-.053
GMA-V	25.5 (8.10)	-	.523*	.511*	-.205*	.169	-302*	.080	.240*	.158
MAI Total	180.8 (29.7)	.541*	.930*	.891*	.192	.065	.216	.156	.242	.321
MAI Knowledge	3.7 (.66)		-	.699*	-.200*	.038	.161	.215*	.258*	.278*
MAI Regulation	3.2 (.70)			-	-.114	-.139	.254*	.076	.199*	.325*
Administrative Interests (AI)	3.0 (.39)				-	.199*	. 032	.028	-.129	207*
Technical Interests (TI)	2.7 (.70)					-	-.068	.138*	.059	.225*
Managerial Interests (MI)	3.4 (.71)						-	.139	.337*	.467*
Interests in Services (IS)	3.2 (.46)							-	.182	.212*
Scientific Interests (SI)	3.4 (.56)								-	.286*
Helping People Interests (HI)	3.3 (.95)									-

*Statistically significant result; MAI-K - MAI Knowledge, MAI-R – MAI Regulation, AI – Administrative Interests, TI – Technical Interests, MI – Managerial Interests, IS – Interests in Service, SI – Scientific Interests, HI – Helping People Interests

3.3. Relations among cognitive competencies, self-regulated learning, and professional interests

Pearson product-moment correlations among all continuous variables included in the analyses are presented in Table 1. The .05 level was adopted as a significance level. Metacognitive knowledge and metacognitive regulation was positively correlated with verbal competency, some factors of professional interests such as administrative interests, organizational and managerial interests, helping people interests, and with age. The small correlations between other variables (i.e., r = .01 to r = .10) indicate that these variables can be used in regression analyses without risking multicollinearity. Notably, the moderate correlation between metacognitive awareness variables and verbal competency (r = .523; r = .511 respectively) will make it difficult for these variables to contribute much unique variance to equations in which they are both included.

The results show a strong relationship between verbal competency and metacognitive awareness. The higher verbal competency individual has, the higher his/her metacognitive awareness is. The strength of this relationship is the most notably apparent between the verbal competency and metacognitive knowledge, as well as metacognitive awareness (including its two components). Regarding the association between verbal competency and professional interests' factors, the table shows the trend that there is a weak positive relation among verbal competency and organisational and managerial interests, as well as scientific interests representing a part of cognitive interests. Closest correlation appeared between metacognitive awareness and helping people interests. The relationship of administrative interests and verbal competency is negative. Similarly, the association between metacognitive awareness and administrative interests is too negative. Thus, students with higher verbal competency and metacognitive awareness will present administrative interests at least. On the other hand, they possess more developed organisational and managerial interests and helping people interests. Correlations with other dimensions were not significant enough. This may be due to sample characteristics and size.

Metacognitive Awareness: To determine the extent to which cognitive competency and professional interests predicted metacognitive awareness, verbal competence, and factors of professional interests were entered into a simultaneous multiple regression equation (Table 3). Verbal competency, technical interests, and helping people interests accounted for one-third of the variance in metacognitive regulation (F = 8.501, p = .000; R2adj = .335). Metacognitive knowledge is predicted by verbal competency and helping people interests (F = 7.8690, p = .000; R2adj = .315). The magnitude of the beta weights associated with verbal competency suggests that this competency is stronger predictor of metacognitive awareness than professional interests.

*Professional Inte*rests: To determine the extent to which cognitive and metacognitive competencies predicted professional interests, verbal competence, metacognitive knowledge, and metacognitive regulation were entered into a simultaneous multiple regression equation (Table 2). Verbal competency and metacognitive awareness accounted for almost one-tenth of the variance in helping people interests (F = 4.860, p = .003; R2adj = .089) as well as in technical interests (F = 4.820, p = .003; R2adj = .087). As shown in Table 2, after controlling for the shared variance among the cognitive competency and metacognitive awareness, each was independently related to differences in students' professional interests factors such as technical interests, organizational and managerial interests etc. Specifically, metacognitive regulation (β = -.404) and verbal competency (β = .285) were related to increased technical interests. The magnitude of the beta weights associated with metacognitive regulation and verbal competency suggests that these two competencies are stronger predictors of professional interests than metacognitive knowledge and other factors, such as age or education level.

Table 2. Regression Analysis for Metacognitive Awareness

Metacognitive Awareness	β	t (p)
Metacognitive Knowledge (F = 7.869, p = .000; R^2adj = .316)		
Helping People Interests	.188	2.024 (.045)*
GMA-V	.488	5.743 (.000)*
Metacognitive Regulation (F = 8.502, p = .000; R^2adj = .335)		
Technical Interests	-.179	-2.170 (.032)*
Helping People Interests	.220	2.401 (.018)*
GMA-V	.521	6.221 (.000)*

Table 3. Regression Analysis for Professional Interests

Professional Interests	β	t (p)
Administrative Interests (F = 2.393, p = .071; R^2adj = .033)		
MAI-K	-.018	-1.405 (.162)
MAI-R	.095	.737 (.462)
GMA-V	-.158	-1.452 (.149)
Technical Interests (F = 4.820, p = .003; R^2adj = .087)		
MAI-K	.171	1.348 (.180)
MAI-R	-.404	-3 .207 (.001)*
GMA-V	.285	2.702 (.007)*
Managerial Interests (F = 4.836, p = .003; R^2adj = .088)		
MAI-K	-.117	- .923 (.357)
MAI-R	.204	1.622 (.107)
GMA-V	.258	2.446 (.015)*
Interests in Services (F = 2.342, p = .076; R^2adj = .032)		
MAI-K	.321	2.456 (.015)*
MAI-R	-.140	-1.083 (.280)
GMA-V	-.016	-.146 (.884)
Scientific Interests (F = 3.441, p = .019; R^2adj = .058)		
MAI-K	.185	1.436 (.154)
MAI-R	-.004	-.037 (.969)
GMA-V	.145	1.351 (.179)
Helping People Interests (F = 4.860, p = .003; R^2adj = .089)		
MAI-K	.110	.866 (.388)
MAI-R	.266	2.115 (.036)*
GMA-V	-.036	-.337 (.737)

3.4. Path analysis

To examine the competency model, a path analysis was conducted by testing a series of simultaneous regression models. Specifically, professional interests scores were regressed on verbal competency scores and metacognitive awareness scores, and metacognitive awareness scores were regressed on professional interests' scores and verbal competency scores.

The standardized regression coefficients are reported below and all tests of significance are two-tailed (Table 2 and Table 3). For the most part, the model responded as expected. Metacognitive awareness was found to be positively associated with verbal competency, $r = .541$, $p < .05$, and negatively associated with administrative interests, $r = -.019$, $p < .05$. Additionally, metacognitive awareness was positively associated with organisational and managerial interests, $r = .216$, $p < .05$, as well as positively associated with helping people interests, $r = .321$, $p < .05$. The details of the analyses are provided in Table 1.

4. Conclusion

Our study was intended to identify the relationship among verbal competency, self-regulated learning strategies (metacognitive awareness) of both university and high school students in Slovakia. We have not confirmed significant differences among students in terms of education level, gender in verbal competence. Some distinctions were found in the self-regulated learning (metacognitive knowledge and metacognitive regulation) in favour of female students. Correlation analysis proved significant associations among the level of verbal competence and regulation of learning (metacognitive regulation), this finding is similar to that of Carr, Alexander, & Schwanenflugel (1996), Shore (2000). Significant positive relationship was revealed between the verbal competence and the professional interests focused on organizational and managerial activities, and scientific interests. Metacognitive knowledge is significantly associated with scientific interests and helping people interests. Metacognitive regulation is positively linked to interests in organizational and managerial activities and helping activities. We have confirmed that professional interests can be predicted by verbal competence and metacognitive awareness. On the other hand, metacognitive awareness can be also be predicted by professional interests. It is consistent with the view of Barak (2000). These results could be interpreted very cautiously because of small size sample and should be the subject of further research including the more representative sample. The research is a base for creating the model of development competencies in higher education.

Acknowledgements

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