LEARNING MOTIVATION IN METACOGNITIVE MONITORING RELIABILITY

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The paper tries to contribute to better understanding of the reliability of metacognitive monitoring. The research is centred in a precise theoretical framework of motivation in metacognitive monitoring of the learning activity of university students($n = 262$; $M = 19,5$; $SD = 1,87$). Moreover, we aimed to study the role of the learning motivation in such metacognitive monitoring error as the illusion of knowing.To diagnose the role of the learning motivation in metacognitive monitoring reliability a method of motivation diagnosis by Ilyina (2003) was used provided by the study of the structure of motivation in the university activity. The results of the empirical study of the learning motivation in metacognitive monitoring are highlighted. In particular, the results show that among the most important characteristics, student motivation is aimed to provide better understanding of the nature of metacognitive monitoring reliability and can help in the annihilation of the negative impact of the illusion of knowing on metacognitive monitoring of the university learning activity. Those students who were focused on knowledge performed accurate metacognitive judgements. However, among the students targeted for occupation the accuracy of metacognitive monitoring was the highest ($M_{aJOL} = -.006$; $SD = .01$; $M_{aRCJ} = -.006$; $SD = .02$; $M_{JOL} = .03$; $SD = .02$; $M_{RCJ} = .00$; $SD = .01$) ($p = .05$). Possible prospectives of future investigations of the problem are also described.

Key words: illusion of knowing, learning activity, metacognitive monitoring, motivation, reliability, self-regulated learning.

Руслана Каламаж, Марія Августюк. Навчальна мотивація в достовірності метакогнітивного моніторингу. У статті вивчено аспекти достовірності мета-когнітивного моніторингу. Зокрема, дослідження зосереджене на теоретичному обґрунтуванні ролі мотивації в метакогнітивному моніторинзі навчальної діяльності студентів ($n = 262$; $M = 19,5$; $SD = 1,87$). Крім того, ми ставили за мету дослідити роль навчальної мотивації в ілюзії знання як помилки мета-когнітивного моніторингу. Для діагностики ролі навчальної мотивації в досто-вірності метакогнітивного моніторингу використано метод вивчення мотивації Т. Ільїної (2003 р.), спрямований на розгляд структури мотивації в студентів. Також виокремлено результати емпіричного дослідження ролі навчальної мотивації в метакогнітивному моніторингу. Згідно з отриманими результатами, серед найважливіших характеристик мотивації відзначено роль надання кращого розуміння природи ефективності метакогнітивного моніторингу. Саме навчальна

мотивація покликана сприяти нівелюванню негативного впливу ілюзії знання на метакогнітивний моніторинг навчальної діяльності студентів. Ті з них, котрі були зосереджені на отриманні знань, показали точні метакогнітивні судження. Однак серед студентів із переважанням мотивації на отримання професії точність метакогнітивного моніторингу була найвищою (M_{aJOL} = -.006; SD = .01; M_{aRCJ} = -.006; SD = .02; M_{JOL} = .03; SD = .02; M_{RCJ} = .00; SD = .01) (p = .05). Окреслено перспективи подальших розвідок із цієї проблеми.

Ключові слова: ілюзія знання, навчальна діяльність, метакогнітивний моніторинг, мотивація, об'єктивність, саморегульоване навчання.

Руслана Каламаж, Мария Августюк. Учебная мотивация в объективности метакогнитивного мониторинга. В статье изучаются аспекты объективности метакогнитивного мониторинга. Исследуется теоретическое обоснование роли мотивации, что выступает одной из причин иллюзии знания в метакогнитивном мониторинге учебной деятельности студентов (n = 262; M = 19,5; SD = 1,87). Также мы исследуем роль учебной мотивации в иллюзии знания как ошибки метакогнитивного мониторинга. Для диагностирования роли учебной мотивации в объективности метакогнитивного мониторинга спользован метод изучения мотивации Т. Ильиной (2003 р.), направленный на изучение структуры мотивации в студентов. Также выделены результаты эмпирического исследования роли учебной мотивации в метакогнитивном мониторинге. В частности, в соответствии с полученными результатами, среди наиболее важных характеристик мотивации отводится роль предоставления лучшего понимания природы эффективности метакогнитивного мониторинга, и именно мотивация призвана способствовать нивелированию отрицательного влияния иллюзии знания. Те студенты, которые были сосредоточены на получении знаний, показали точные метакогнитивные суждения. Однако среди студентов с преобладанием мотивации на получение профессии точность метакогнитивного мониторинга была наиболее высокой (M_{aJOL} = -.006; SD = .01; M_{aRCJ} = -.006; SD = .02; M_{JOL} = .03; SD = .02; M_{RCJ} = .00; SD = .01) (p = .05). Определяются перспективы дальнейших разведок по данной проблеме.

Ключевые слова: иллюзия знания, метакогнитивный мониторинг, мотивация, учебная деятельность, саморегулированная учебная деятельность.

Background of the Problem

A special place in the psychological and pedagogical studies is given for the problem of the learning motivation which is defined as an individual type of motivation included in different learning activities. The need to study the connection between the learning motivation andthe reliability of metacognitive monitoring of university students is grounded on the role of the motivational orientation of the individual in the effectiveness of the learning activity. Confidence in the test is associated with the attribution style, which explains the reasons for the learning

successes and failures by external or internal motives. External motives are characterized by the fact that mastering the content of the subject is not the purpose of learning, but it serves as a way to achieve other goals – receiving higher grades, certificates, diplomas, scholarship, and praises(Avhustiuk, 2016; Avhustiuk, 2015).

In the psychological literature there is a considerable amount of researches investigating the relationships between metacognition and motivational factorsin the process of the learning activity. Among the most noteworthy studies are the studies of P. PintrichandE. DeGroot (1990), A. Bandura (1997), S. Coutinho (2007; 2008), etc. Various approaches have been proposed to solve the issue of theinfluence of goal-orientation and self-efficacy on the effectiveness of the learning activity (Pintrich & DeGroot, 1990; Pajares, 1996; Pintrich & Schunk, 2002). Thus, P. Pintrich studies the relationship between motivation and self-efficacy and goal-orientation in the sphere of self-regulated learning in school and university circumstances (Pintrich, 1999; Pintrich, 2004). D. Schunk stresses that rationally justified learning aims can help in the process of appearance of significant motivational effects (Schunk, 1995). S. Coutinho convicts that highly motivated students who effectively use metacognitive strategies are also confident that they can perform the task successfully (Coutinho, 2008). Regulation of motivation consists of the trials used to regulate diverse motivational beliefs. These notions also have thorough theoretical background (Pintrich, 2004). A conceptual framework that is based on the diagnosis of the learning motivation is provided by the study of the structure of motivation in the learning activity. The questionnaire (developed by T. Ilyina, 2003), studies the structure of motivation in the learning activity of university students and highlights its three main goals: to receive knowledge, to master an occupation, and to get a diploma (Ilyina, 2003).

The sphere of the study of the learning motivation in metacognitive monitoring of the learning activity is diverse as there are a great number of different models and approaches. Much work on the potential of the learning motivation has been carried out, yet there are still some critical issues concerning the topic.

In an attempt to study the role of the learning motivation in metacognitive monitoring of the university learning activities, we need to take into account also the role of self-regulated learning. Self-regulated learning, in particular, presumes potential monitoring, control, and regulation of different aspects of personal cognition, motivation, and behaviour. But this

does not mean that students will or are able to provide monitoring and control of their own cognition, motivation, or behavioural peculiarities constantly and under all possible conditions. Only certain manifestations of the indicated functions are possible.

Among a large number of self-regulated learning models, there is a correlation between motivation and learning strategies, in which external motives relate to superficial learning strategies, while internal motives relate to more detailed and more thorough learning strategies. But this kind of relations is not able to facilitate the flexible combination of different goals and strategies under different conditions. Thus, those who study can regulate their own knowledge and motivation. Regulation of motivation consists of the trials of regulation that are supported by a variety of motivational beliefs, and among the most frequently appeared ones there are highlighted goal-orientation, self-efficacy, understanding of task difficulty, beliefs of task importance, and also personal interest in any task performance.

As the bases of self-regulation that is regarded to be the construct that is able to effectively combine academic achievements and the learning activity of every single participant of the learning process there lies the effectiveness of the learning processes. Self-regulatory concept is interpreted by different models and is characterized by the diversity of the explanation of its terms (Boekaerts, 1996; Zimmerman, 1998; Pintrich, 2000, et al.).

Motivational studies are based on two approaches: orientation on learning and orientation on performance (Dweck& Elliott, 1983). Motivational aspect of the first approach is aimed to support new topic of learning and is possible due to thorough understanding of this new topic and its aim in the development of the competence of the learner. And, on contrary, orientation on performance is centered in a demonstration of personal skills and results of the performance of the needed tasks aiming at achieving higher marks or being praised if to compare to others.

Therefore, the **aim** of this study is to provide theoretical and empirical investigation of the role of learning motivation in the reliability of metacognitive monitoring of the learning activity of university students.

Procedure of the Research, Methods and Test Materials

According to the theoretical basis of the study, our empirical research aimed to analyze the role of the learning motivation in the reliability of metacognitive monitoring of the learning activity of university students.

Moreover, we also aimed to study the influence of the learning motivation on the illusion of knowing that is regarded as metacognitive monitoring error.

A total of 262 university students of different faculties of the National University of Ostroh Academy (192 female and 70 male students, $M = 19,5$; $SD = 1,87$) participated in this study voluntarily and for free. All the participants were Ukrainian students in their 1st to 5th year of university.

Data were gathered with the use of such questionnaire as a method of motivation diagnosis (according to Ilyina, 2003) provided by the study of the structure of motivation in the university activity (Ilyina, 2003). The questionnaire studies the structure of motivation in the learning activity of university students and highlights its three main goals: to receive knowledge, to master an occupation, and to get a diploma. The received data were analysed from the spectrum of the levels and frequency of appearance of the illusion of knowing in metacognitive judgements of the participants.

All the received data were processed by a computer program *IBM SPSS Statistics 20* and calculations were done by *Excel* program. Data were processed by means of mathematical and statistical methods such as *ANOVA* analysis, *T*-test, correlation coefficient of Goodman-Kruskal, Spearman rank of correlation, Pearson linear correlation, *O/U* index, calibration index, etc.

Metacognitive monitoring errors were determined as the difference between subjective evaluation of the accuracy of retrieval (metacognitive judgements rating) and the relative share of results according to the total number of given tasks. The larger the difference is, the greater is the manifestation of the illusion of knowing, and vice versa. We used a three-level scale from -1 to +1 that was devided from -1 to -.14 (the level of underconfidence or the illusion of not knowing), from -.15 to + .14 (the adequate level of monitoring accuracy when the illusion of knowing is negligible or absent), and from + .15 to +1 (the level of overconfidence or the illusion of knowing). According to Jönsson et al., (2005), the average level of *O/U* index is significantly different from zero (*O/U* = .14; *SD* = .17) (Jönsson, Olsson, & Olsson, 2005).

At the diagnostic stage the participants were asked to answer questions from thelearning motivation questionnaire. At the stage of the laboratory experiment the participants learned six texts of different styles (the scientific prose, the newspaper and the belletristic styles – two texts of the same style according to different length) and of different length (larger texts accounted 25–30 sentences and smaller texts accounted 10–15 sentences), 18 statements, and 18 pairs of words in Ukrainian. All quantitative data were

divided into nine groups according to task type: open-answer questions, 'Yes'/'No'/'Do not know' questions, andmultiple-choice questions for texts, statements, and word pairs.

In general, our experiment consisted of such phases: Information Learning Phase, Phase of Evaluation of the Learning Information Effectiveness, Distractor Phase, Task Performance Phase, and Phase of Evaluation of the Task Performance Effectiveness. Students performed prospective metacognitive judgements of learning about confidence (JOLs) and prospective judgements about the number of correct answers (aJOLs), as well as retrospective metacognitive judgements of both types (RCJs and aRCJs). Average indicators of the illusion of knowing (overconfidence) and of the illusion of not knowing (underconfidence) were defined with the help of calibration procedure.

Research Results and Discussion

According to the received results, we managed to highlight the following peculiarities of the illusion of knowing in the learning motivation. Thus, the results from the diagnostic stage showed predominance of the learning motivation to receive knowledge (48,7 %) and to master an occupation (39,2 %), whereas external motivation to get a diploma appeared only in 12,1 % of the participants.

When the participantswith motivation to master an occupation performedaJOLs, among those students who had committed monitoring errors, a greater proportion (40,6 %) was prone to overconfidence of performance correctness ($M = .25$). At the same time, those students who wereinsufficiently confidentin the correctness of the tasks (24,6 %) showed rather high underestimation rates ($M = .47$).

Among the studentswiththe predominance of the learning motivational skills inaJOLs, those students who committed monitoring errors took the greater part (30,6 %) and were inclined to underconfidence in the correctness of performance ($M = - .42$). At the same time, the proportion of the participants with overconfidence in the correctness of the tasks performance was not high (8 %) ($M = .25$).

When students,being motivated to master anoccupation, performed aRCJs, a larger proportion of those students who had committed monitoring errors (26,2 %) tended to overconfidence in the correctness of performance ($M= .26$). At the same time, this share, in comparison with prospective judgments of the kind, significantly decreased. In other words, the number of the participants who are overconfidentabout the correctness

of task performance can decrease, and the number of the participants who has an adequate level of the reliability of metacognitive monitoring, on the contrary, can increase. At the same time, the average indicator of the illusion of knowledge can remainun changed.

In aRCJs, a greater proportion of the students with motivation to receive knowledge (27,8 %) was prone to overconfidencein the correctness of performance (*M*= .23). At the same time, this share, in comparison with aJOLS, increased significantly (from 8 % to 27,8 %). That is, in aRCJs the number of the participants who were overconfidentin the correctness of the performance increased. At the same time, the average indicators of illusion of knowledge practically did not change. Moreover, those students who lacked confidence in the correctness of the tasks performance (5,8 %) showed very high levels of underestimation (*M* = - .53) which also increased compared to the corresponding prospective judgments.

In JOLs among those participantswho tended to master an occupation a greater proportion (35 %) were prone to overconfidence of performance correctness (*M* = .27). At the same time, those students who were underconfidentin the correctness of the tasks performance (27,7 %), showed an underestimation at the level of *M* = - .30.

In JOLs among the students motivated to receive knowledge a greater proportion (30 %) of those who had committed monitoring errors was inclined to underconfidence in the correctness of the tasks performance (*M* = - .32). The same trend was observed inaJOLs, however, as compared to the latter, the average levels of the illusion of not knowing (underestimation) decreased. That is, during the performance of prospective judgments the level of illusion of not knowing in the form of underestimation can reduce.

While performing RCJs, among the participants with motivation to master an occupation, a greater proportion (30,6 %) was inclined to underconfidence in the correctness of the performance (*M* = - .29). At the same time, the proportion of overconfident students, compared with JOLs, decreased significantly (by 10 %). In other words, after completing the needed tasks inRCJs, the number of students who were overconfident in the correctness of the performancedecreased. In general, after completing the tasks, the adequacy of metacognitive monitoring was higher (44,4 % vs. 37,3 %). At the same time, the average indicators of illusion of knowing did not differ significantly.

The most widespread error of metacognitive monitoring of those students who are externally motivated to get a diploma is the illusion of knowing or subjective overconfidence in the correctness of tasks performance.

Our findings seem to show that those students who were focused on receiving knowledge performed accurate metacognitive judgements. However, among the students targeted for occupation who made accurate metacognitive judgements the accuracy of metacognitive monitoring was the highest (M_{aJOL} = -.006; SD = .01; M_{aRCJ} = -.006; SD = .02; M_{JOL} = .03; SD = .02; M_{RCJ} = .00; SD = .01) (p = .05). Average results of the illusion of knowing in metacognitive monitoring from the spectrum of the learning motivation are shown in table 1.

Table 1

Average Results of the Illusion of Knowing in Metacognitive Monitoring from the Spectrum of the Learning Motivation

	Metacognitive Monitoring Errors	**Type of Learning Motivation**	*M*	*SD*
aJOLs	The Illusion of Knowing	To Master an Occupation	.25	.19
	The Illusion of Knowing	To Receive Knowledge	.25	.2
	The Illusion of Knowing	To Get a Diploma	.21	.18
aRCJs	The Illusion of Knowing	To Master an Occupation	.26	.15
	The Illusion of Knowing	To Receive Knowledge	.23	.17
	The Illusion of Knowing	To Get a Diploma	.21	.28
JOLs	The Illusion of Knowing	To Master an Occupation	.27	.3
	The Illusion of Knowing	To Receive Knowledge	.26	.2
	The Illusion of Knowing	To Get a Diploma	.19	.12
RCJs	The Illusion of Knowing	To Master an Occupation	.26	.2
	The Illusion of Knowing	To Receive Knowledge	.25	.18
	The Illusion of Knowing	To Get a Diploma	.18	.14

Note. $p \leq .05$.

In general, these results may seem to suggest that the study of motivation is determined by a number of specific factors such as educational system, organization of the learning process, subjective characteristics of a student (age, gender, intellectual development, level of aspiration, self-esteem, cooperation with other members of the learning process, etc.). We have obtained satisfactory results showing that learning motivation is proved to be significant in the increasing reliability of metacognitive monitoring. Our findings appear to be well substantiated by other authors (Nietfeld, Cao, & Osborne, 2006).

The evidence from this study points towards the idea that the causes of the learning successes and failures are accounted by external and internal reasons. It is proved that those students who are governed mainly by external motivation (orientation on diploma) are characterized by overconfidence, whereas those who are characterised by internal motives (self-orientation and skills development)tend to underconfidence (Kroll& Ford, 1992).

Conclusion

Learning motivation is very important in the sphere of psychological and educational researches. The phenomenon is regarded as a very influential prospective aiming toimprove the reliability of metacognitive monitoring. It is plausible that a number of methodological limitations (laboratory experiment bases, etc.) have influenced the results obtained. Nevertheless, the findings suggest that the priority task of the university teachers is toprovide all the necessary conditions that can supporttheir students with the intensifyingof learning motivationof knowledge receiving. Moreover, our investigations into this area are still ongoing and seem likely to provide more thorough study of the notion.

Possible prospectives of future investigations of the problem should be based on the necessity to conduct studies aiming at understanding all possible changes in the motivational beliefs shift of university students. A promising area of research is also to conduct studies of the implementation of a wide range of metacognitive strategies such as learning motivation in the processes of self-regulated learning.

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