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The influence of a psychological and a cognitive component of a student's thinking style on his/her success in life-long learning

La influencia de un componente psicológico y cognitivo del estilo de pensamiento de un alumno sobre su éxito en el aprendizaje permanente

Anna Mikhaylovna TATARINCEVA 1; Natalia Leonidovna SOKOLOVA 2; Marina Georgiyevna SERGEEVA 3; Nadezhda Nikolayevna BEDENKO 4; Ivan Sergeyevich SAMOKHIN 5

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ABSTRACT:

Introduction. Contemporary lecturers should be able to teach a lot of students with different abilities, needs, interests, cultures, backgrounds, approaches to learning, stresses, sometimes with the lack of motivation, self-confidence, persistence, limited perceptional abilities and uncertainty of their future life. Each lecturer has to understand her/his teaching style and accommodate it to their students' learning styles. *Methods.* The method of the research is the theoretical analysis of scientific literature on the given problem. Learning, psychological and cognitive components of students' thinking styles are examined. *Results.* The essence of thinking style, the cognitive types, eight psychological types' preferences and appropriate learning strategies are explored. The authors conclude that effective teaching includes the following steps:

RESUMEN:

Introducción. Los profesores contemporáneos deberían ser capaces de enseñar a muchos estudiantes con diferentes habilidades, necesidades, intereses, culturas, antecedentes, enfoques de aprendizaje, estrés, a veces con falta de motivación, confianza en sí mismos, persistencia, habilidades de percepción limitadas e incertidumbre sobre su futuro. vida. Cada profesor debe comprender su estilo de enseñanza y adaptarlo a los estilos de aprendizaje de sus alumnos. *Métodos*. El método de la investigación es el análisis teórico de la literatura científica sobre el problema dado. Se examinan los componentes de aprendizaje, psicológicos y cognitivos de los estilos de pensamiento de los estudiantes. *Resultados*. Se explora la esencia del estilo de pensamiento, los tipos cognitivos, las preferencias de ocho tipos psicológicos y las estrategias de aprendizaje

assessing the developmental needs of students; developing a comprehensive, effective learning program based upon the needs assessment; assessing the individual thinking styles of students and lecturers; planning lecturers' interventions that are compatible with the learning styles needed by students; evaluating teaching outcomes to determine the extent in which program and teaching objectives have been achieved. *Discussion.* The authors support the point of view of DeBello that most students are capable of analyzing their own thinking style, which gives them a chance of choice and responsibility for their own learning. *Conclusion*. The more we know our students, their thinking styles in general and the psychological and cognitive components in particular, along with their goals and needs, the more successful the students will be in their life-long and life-wide learning.
Key words: Learning, thinking, style, cognitive, psychological, component, perception, success, higher school, life-long learning.

apropiadas. Los autores concluyen que la enseñanza efectiva incluye los siguientes pasos: evaluar las necesidades de desarrollo de los estudiantes; desarrollar un programa de aprendizaje integral y efectivo basado en la evaluación de necesidades; evaluar los estilos de pensamiento individuales de estudiantes y profesores; planificar las intervenciones de los profesores que sean compatibles con los estilos de aprendizaje que necesitan los estudiantes; evaluar los resultados de la enseñanza para determinar en qué medida se han logrado los objetivos del programa y la enseñanza. Discusión. Los autores respaldan el punto de vista de DeBello de que la mayoría de los estudiantes son capaces de analizar su propio estilo de pensamiento, lo que les da la oportunidad de elegir y ser responsables de su propio aprendizaje. *Conclusión*. Cuanto más conozcamos a nuestros estudiantes, sus estilos de pensamiento en general y los componentes psicológicos y cognitivos en particular, junto con sus metas y necesidades, más exitosos serán los estudiantes en su aprendizaje de por vida y en toda la vida.
Palabras clave: Aprendizaje, pensamiento, estilo, cognitivo, psicológico, componente, percepción, éxito, escuela superior, aprendizaje de por vida.

1. Introduction

During the last fifty years constant scientific and technological innovations and changes have had a profound effect on students' learning needs and their approaches to learning which can no longer be divided into a place and time to acquire and apply knowledge. These changes determine not only life-long learning but life-wide learning as well (Koke, 2003). Thus, learning can be seen as taking place on an on-going basis from our daily interactions with others and with the world around us (Fisher, 2010)

 Latvia has entered the European Union, its system of higher education. The process of teaching students at Latvian higher schools should be qualitative in order to correspond to increasing demands of the International Labour Market, different international educational and business projects. To meet these challenges lecturers should have more responsibility for their methods of teaching in order to satisfy needs for the highest level of professional judgements rather than to implement the simple routine application of materials and methods.

Contemporary lecturers should be able to teach a lot of students with different abilities, needs, interests, cultures, backgrounds, approaches to learning, stresses, sometimes with the lack of motivation, self-confidence, persistence, limited perceptional abilities and uncertainty of their future life. Each lecturer has to understand her/his teaching style and accommodate it to their students' learning styles.

A lot of research indicate that 85% of lecturers teach according to their styles but not according to learning styles of their students, that is why students' academic achievements in learning significantly decrease in those cases when lecturers' and students' styles are mismatched (Dunn, 1989, Milgram, 2000).

We live in a very fast changing society. One of the most important requirements of the present time is our deeper knowledge of our students' learning differences, thinking styles, difficulties and sometimes disabilities, their predispositions to the definite types of information perception, tasks and tests to achieve their learning goals successfully during life-long learning.

Life-long learning is the ongoing, voluntary and self-motivated pursuit of knowledge for either personal or professional reasons. It enhances social inclusion, active citizenship and personal development, self-sustainability. (Commission of the European Communities, 2006).

The ***problem*** of life-long learning in the light of students' individual factors is very important

nowadays, because a human factor was ignored for many years. Fortunately, educators begin to pay more attention to the development and self-actualization of students in the context of modern theories of learning and the development of personality.

The **aim** of the research is to investigate the influence of a cognitive and a psychological component of a student's thinking style on her/his success in life-long learning.

The **object** of the research is life-long learning.

2. Methods

The method of the research is the theoretical analysis of scientific literature on the given problem. Learning, psychological and cognitive components of students' thinking styles - these are the words closely connected in the educational process of today.

Lecturers can significantly increase success, positive attitude to learning, the willingness to learn of their students by responding effectively to cognitive and psychological types of students, their thinking styles. There are many definitions of thinking style, which differ from one another in the methodological and scientific literature.

3. Results

Thinking (learning) style is defined as the conditions under which each person begins to concentrate, absorb, process, and retain new or difficult information and skills (Spark, DeBello, Brennan& Murrain, 1981). Spearman (1989) believes that each person's thinking style consists of 23 elements: emotional, cognitive, environmental, social, physical, psychological elements.

The authors support the point of view of Stubbs (1999), who claims thinking style is the preference in the use of abilities. Spark (1981) believes that thinking style is the cognitive, affective and physiological trait that is a relatively stable indicator of how students perceive, interact with and respond to the learning environment. Swain (1990) claims thinking style is the identifiable individual approach to learning situations.

McCarthy (1984) points out that thinking styles are the generalized differences in the learning process as measured by a *Self*-Report Test, called the Learning Style Inventory. White (2008) believes that thinking style is the characteristic manner in which an individual chooses to approach a learning task. It is proved by psychologists that the perception element (how people absorb new information) and the cognitive element of thinking styles (how individuals process gained information) are biologically imposed and these elements are developed during the individual life learning and experiences.

The mode of how people process the difficult and new information is called the cognitive component of the individual's thinking style (Stubbs, 1999, Restak & Thies, 1999). Thinking style is a rather stable characteristic of a student, as according to Spearman (1999), Dunn (1989), strong learning preferences are changed only over years as a result of high willingness, motivation and strong personal effort.

Understanding individual differences is an important and useful tool, which served lecturers in some ways:

- First, lecturers have a method to teach that is diverse and adaptive enough to meet various learning needs of students who are not necessarily oriented towards learning;
- Second, lecturers can show students they care about the individuality and integrity of each learner;
- Third, lecturers can better understand their own teaching style, its strengths and weaknesses (White, 2008).

Different criteria exist for the examination of students' approaches to learning: Personal Response, Theoretical Background, Complexity of Information, Ability to Implement, Multiple Uses (Pica, 2006).

Thinking about the process of knowing "metacognition" refers to higher order thinking which

involves active control over the cognitive processes engaged in learning (Livingsone, 2007).

One of the most used instruments of cognitive thinking types' identification is the Myers-Briggs Type Indicator, developed by I. Myers (1962) based on the theories of Carl Jung (1921). Jung made a major contribution to the ability to understand Self by dividing human behaviour into two basic categories: perception and judgement (Jung, 1921).

Jung's theory proves that humans constantly choose between the open act of perceiving or finding out, discovering, and the closed act of judging, or taking action, deciding, evaluating. A perceiver likes to spend more time in perceiving activities, a judger – in judgingactivities.

Jung (1921) claims individuals prefer to perceive either through their senses or their intuition, as well as they prefer to make judgments either through their thinking or feeling processes. However, all four functions – sensing, intuition, thinking and feelings – are inherent in each individual.

One function is always dominant or the most favoured, another one is auxiliary and ranks as the second most used function, the third one is the tertiaryfunction, which is less often exercised and demands more energy to use. The fourth one is a person'sinferior function, which sometimes is called the shadow function. It is a person's weak and immature function. Only with maturity, reflection, and conscioususe the inferior function serves the individual by providing inspiration and renewed energy.

This process is called individualization (Jung, 1921). Jung added the final dimension of extraversionand introversion to his psychological descriptions. The authors supports Jung's point of view that persons who prefer to getenergy in an extraverted way will extravert their dominant function and introvert all the other functions, while those ones who prefer to get energy in an introverted way will introvert their dominant function and extravert all the rest. According to McCaulley's Psychological Type Theory (McCauley, 1988), as further defined by Myers (1962), may be described as following:

E - A person is interested in the outer world of actions, objects, persons - Extraversion. 2. I - A person is interested in the inner world of concepts and ideas – Introversion. 3. S - A person prefers perceiving immediate, real, solid facts of experience – Sensing. 4. N - A person prefers perceiving possibilities, meanings of experience – Intuition. 5. T – A person prefers making judgements, decisions objectively, impersonally, by analyzing facts and ordering them, in terms of cause and effect – Thinking. 6. F - A person prefers making judgements, decisions subjectively, personally, by weighing values for the importance of choices for oneself and others –Feelings.7. J - A person prefers living in a planned way, aiming to regulate, control events – Judgement. 8. P - A person prefers living in a flexible, spontaneous way, aiming to understand and adapt events – Perception (McCaulley, 1988).

Pica (1996) believes that the extraverted learner in the process of life-long learning prefers an outward focusingofenergy, extraversion makes a person seek influences as a source of energy, pleasure, and satisfaction outside, it makes a person enjoy open, active interactions, become absorbed in activities, have a high tolerance for crowds, noise, public appearances. The authors would like to analyze how the preferences for extroversion could be translated into learning instructions. Extraverted students like to think out loud, they like listening to music (or sounds) while learning, they really don't know what they know until they have the chance to talk it out, for them talking is a clarifying process.

The extraverts learn by doing. They are action-oriented and prefer hands-on experience, they like to learn together, enjoy sharing ideas, tasks. The extraverts enjoy variety, they prefer experiencing a whole range of activities, focusing finally on selected few ones.

The extraverts need a feedback from a lecturer, peers, they prefer learning in groups of peers or with lecturers. A lecturer should create a learning environment in which the extraverts have opportunities to speak, discuss problems and present their ideas.

 A lecturer should involve students in team work, practical activities, he/she makes sure

extraverts know what they are expected, tells them how well they do something, incorporates a positive feedback, encourages students to ask questions, give opinions.

The authors believe humans choose extraversion or introversion very early, in infanthood. Extraverts feel more confident when they have a sense of a genuine interest in their task.

They like to use aids – overheads, demonstration utensils – while they are giving their presentations at lectures; they need time to prepare (rehearsal time). Extraverts, to the authors' mind, learn to do an extraverted task in a way most conductive to their own needs.

Extraverts prefer silent reading, wonder if they could use alternative methods of study.

Extraverts learn by trials and errors. They usually haven't persistence to finish a learning task, they begin to do another task, or some tasks simultaneously, without finishing the first one. Let's analyze the behaviour of an introverted student at a lecture. Introversion is an inward focusing of energy, it makes a student look for sources of energy, satisfaction,safety inward.

The introverts enjoy intense, focused relationships, events. Being cautious, considerate and thoughtful, the introvert prefers a well-ordered lecture-room in which students work quietly on one task at a time. They always finish their learning tasks.

Having analyzed the link between introversion and thinking style, the authors make the following conclusions. First, introverted students need to think everything through, inside their heads, before they risk responding in front of others, they are often the quiet, thoughtful learners. They prefer to volunteer answer questions rather than to be asked a question directly. Second, introverted students are private beings.

 Their deep sense of privacy extends to the certain learning environment. They need a sense of place and a feeling of ownership over that space. They prefer quiet, uninterrupted work, where concentrated energy focuses on one thing at a time.

Introverted students are self-motivated. They deeply resent anyone "looking their shoulder" as they learn. Such students need clear instructions and should have the opportunity to explore ideas without supervision. If they need help, they prefer to watch an expert, read a resource, or watch video.

The introverts are reflective learners. To the authors' mind, it is very useful to apply questioning methods giving introverts some time to reflect and rehearse before answering.

Introverts always work with a peer whom they trust. Very highly achieving and gifted introverts prefer working alone or with equally developed peers (Schmidt, 1990, McCarthy, 1985, Spark, 1992, White 1998).

By teaching the introverts, a lecturer may write questions on the board before questioning begins, in order to give the possibility to students to write down their answers, and reflect a task before answering. As a result, since extraverts generally do not need as much waiting time (they are impulsive learners), they usually tend to dominate the question-answer phase of learning.

The next is a sensing learner. Sensation is the perceiving function that seeks immediately relevant, accessible experience through the senses. It causes a person to pay careful attention to each detail in his/her immediate environment in a practical, focused way.

Sensation causes a person to enjoy traditional surroundings, to deal with the world in a realistic, down-to-earth manner. Having analyzed the connections between the preference for sensationand a student's thinking style, the authors came to the following conclusions. First, sensing students move cautiously into new learning, prefer a set procedure, usually learn one step at a time. They like to stick to skills and knowledge they already possessed and learn best by building on those in a developmental learning mode. Second, sensingstudents dislike abstract theory, tend to skip over theory when it is presented to them.

Theory should be presented in small pieces, as it relates to the immediate learning task, only when necessary. Sensing students' types need to see a practical reason for learning. Third,

sensing students absorb information through all senses. They want to see, hear and touch as they learn.

These students learn something new very quickly when they can look over a step-by-step procedure, see it performed, and then try it by themselves. Essay questions, formal testsituations, aptitude tests put sensing students at a disadvantage; they often do not perform well in these situations. Any theory should be relevant and serve a practical purpose.

The authors would like to analyze the next type of cognitive behaviour – an intuitive learner. Intuition is the perceiving function that makes sense of the world by creating patterns, inventing hypotheses. Intuition causes a person to scan situations, data in order to see relationships among things in a self-inspiring and inventive way.

Students of this type like to go through the learning experience with changes and adventures. The authors conclude that links between a student's style and the preference for intuition are the following.

First, intuitive learners are inventive students who like to make up possible hypotheses and explanations. They enjoy adding their own original touch or ideas to any given learning situation, like to take risks.

Second, intuitive students seek variety in what they learn, they don't like repetition and resent it deeply when a lecturer forces them into a review situation.

Third, intuitive students work unevenly, grow in spurts, starts, often forget unimportant details, enjoy teaching their less achieving peers.

A thinking learner is the next type the authors would like to analyze. Thinking is the judgement function that values objectives, analytical ways to make decisions, evaluate situations.

Thinking causes a person to stand back, think logically, rationally, critically and honestly. Thinking makes a person value a fair world that runs on logical principles. Let's analyze links among the preference for thinking and the thinking style of students. First, thinking students value honesty, fairness. Second, thinking students are competitive, driven, independent learners – demanding to themselves and others. They like to win, always are confident. Third, thinking students need well organized, logically developed lectures. They value, respect, expect expert knowledge.

To proceed, the authors would like to analyze a feeling learner. Feeling is a judging function that values a subjective analysis and empathetic understanding as a means of decision making and evaluation. Feeling causes a person to seek a personal relationship with the environment, relying on a deep sense of personal values to guide behaviour, judge behaviour of others. Feeling causes a person to orient himself/herself towards relationships, to interrelate with others in an attempt to create harmony in the world around this person. Having analyzed the links between the preference for feeling and thinking style, the authors came to the following conclusions.

First, feeling students need a harmonious learning environment. They take everything personally. A lecturer has to avoid criticism. Feeling students prefer the respectful style of teaching.

Second, feeling students value cooperation, consideration, and consensus. They rarely appreciate a competition because they believe nobody should be made a loser or feel second best.

Third, feeling students prefer to help themselves to grow in a personal way. Learning peaks for them are when values are motivating factors. Feeling students learn best from an instructor whom they like as a person.

Now let's make a theoretical shift to the next type of learners – judging students. According to the Jungian theory (Jung, 1921), judgement is the preference to create order by dealing with the world and decisively acting. Judgement is inclined to use more energies in controlling rather

than in understanding events. Judging causes a person to create an ordered world in which things can happen on time according to a predetermined purpose. Having investigated the preference for judgement, the authors may conclude that it is connected with a thinking style and appropriate learning instructions in such a way.

First, judging students like to plan, schedule and need exact dates in learning progress. They want to see, in advance, a definite structure of learning tasks. Second, judging students want to complete each task started. They crave a sense of closure. Third, judging students expect a lot of feedback on assignments.

They want everything to count and to be evaluated.

A lecturer has to predict the judging students where, when, why things may change. The knowledge of what might happen allows the judging type to relax, feel safe and go along with potential changes.

The last cognitive type of a student the authors would like to analyze is a perceiving learner. According to Jungian theory (Jung, 1921), perception is the preference to deal with the world by following one's curiosity and seeking understanding. A person is inclined to put off decision-making until it is a chance to investigate all kinds of information.

The perceiver may start more tasks than he/she finishes. The perceiver may drop something that no longer seems interesting for him. This person, curious and adaptive, enjoys a flexible, pleasurable learning and lifestyle.

The perceiving type causes a person to resist a structure and to favour changing circumstances in the quest for spontaneity and surprise.

The authors are inclined to analyze how the preference for perception is translated into thinking style and preference for learning instructions. First, the perceiving student enjoys the process of discovering new ideas, but without a lot of pressure. They not always complete everything.

Testing, to the authors' mind, should be reduced to an absolute minimum. Second, perceiving students tend to avoid schedules, they may need the encouragement in a very structured course. A lecture has to help them to stay on task and on time. Perceiving students need degrees of freedom and appreciate any form of flexibility and spontaneity a lecturer can provide.

Third, perceiving students are quite relaxed and open to a variety of styles and ideas, they find pleasure in the most situations, provided the structure is not so rigid that they cannot get any positive emotions. Perceiving students can rarely be bullied into compliance, if they are pressured, they will silently give up. A lecturer should provide a plenty of opportunities for perceiving students to discover and explore, to work with new ideas. Perceiving students respond well to alternatives allowing them to appraise their own work.

The authors conclude that effective teaching includes the following steps:

1. Assessing the developmental needs of students.

2. Developing a comprehensive, effective learning program based upon the needs assessment.

3. Assessing the individual thinking styles of students and lecturers.

4. Planning lecturers' interventions that are compatible with the learning styles needed by students.

5. Evaluating teaching outcomes to determine the extent in which program and teaching objectives have been achieved.

4. Discussion

Individuals are unique and they are central in the educational process. Teaching strategies/techniques must be tailored to accommodate these individual differences.

According to a lot of research when learning is successful it involves positive changes in

students' attitudes to learning, higher education, significantly increases their academic success in learning. When lecturers pay attention to individual differences, thinking styles, cognitive and psychological types of students, all sides benefit. There is also another aspect to the way learning is influenced by cognitive types differences. The discussion of thinking style is an important part of this aspect.

Student's learning is also affected by the degree to which a student is interested in and attracted by a subject. Cognitive types' preferences are related to the interest in different content areas as well as to the way the content is taught.

When considering the importance of the match or mismatch, it is useful to remember that certain subjects will turn on some students' types and turn off others (Myers, 1962).

Since students' success is also deeply influenced by application (persistence in fixing attention and assiduity in performing what is required), Myers (1962) considered the application to be an important factor to keep in mind when considering the importance of individual preferences.

The authors support the point of view of DeBello (1988) that most students are capable of analyzing their own thinking style, which gives them a chance of choice and responsibility for their own learning.

5. Conclusion

The choice is important in life-long and life-wide learning. It is the springboard to the wise decision making. At consultations with students lecturers should identify the need for accommodating students who require the low structure by stressing the importance of efficient lecture-room techniques such as creative writing, open discussion, independent study, which allow for the pursuit of learning objectives through a variety of modalities, "open choice" homeworks with individual projects.

If a lecturer's approach is compatible with a student's thinking style preferences, the goals of teaching and learning will be achieved.

The more we know our students, their thinking styles in general and the psychological and cognitive components in particular, along with their goals and needs, the more successful students will be in their life-long and life-wide learning.

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1. Baltic International Academy, Lomonosova iela 4, Latgales priekšpilsēta, Rīga, LV-1003, E-mail: tatarinceva@inbox.lv

2. Peoples' Friendship University of Russia (RUDN University), 117198, Russia, Moscow, Miklukho-Maklaya st., 6. E-mail: oushkate@mail.ru

3. Peoples' Friendship University of Russia (RUDN University), 117198, Russia, Moscow, Miklukho-Maklaya st., 6. E-mail: sergeeva198262@mail.ru

4. Tver State University, 170100, Russia, Tver, Zhelyabova st. 33. E-mail: bednad@mail.ru

5. Peoples' Friendship University of Russia (RUDN University), 117198, Russia, Moscow, Miklukho-Maklaya st., 6. E-mail: alcrips85@mail.ru

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