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Managerial Preparation in Context of Learning Styles Preferences of Future Managers

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Currently is necessary to identify own way of cognition and information processing, so called the cognitive style, which is connected with learning style. Contribution contains theoretical information about many typologies of learning styles (e.g.. according to brain hemispheres dominance, intelligence, learning motivation, etc.) and research is focused on typlogy of D. A. Kolb (divergator, assimilator, convergator and accomodator). Aim of the research is to analyze preference of learning styles of future managers, to identify correlations between learning styles preference and chosen features of future managers, advantages and disadvantages. of distance education and to suggest some possibilities of learning styles development by methods of creativity development. In contribution is used interrogative method by standardized Kolb's questionnaire, mathematical-statistical methods (descriptive statistics, correlation analysis, $\chi 2$- test) and comparative method. The research sample is composed of 296 future managers, the dominant learning style is accomodator in number of 109 (36,82 %). Contribution contains 3 hypotheses. Statistically significant correlation was explored between learning style and perception of distance education disadvantages, between learning style and professional orientation and between learning style and self-evaluation of future managers. Benefit of the contribution are suggestions for creativity development methods application for these learning styles.

Keywords: learning styles, future managers, self-evaluation, human potential development, presence learning, distance learning, creativity development methods

INTRODUCTION

For end of the 20th century and beginning of the 21th century are typical many significant changes. According to theorists there is the transformation of industial

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society to knowledge society, in which are the most important intellectual capital and people (Kokavcová, 2012, p. 37)“ For the economic growth in future will be significant not only tangible inputs, but also knowledge, identification of changing customers' needs, competition monitoring, information technologies, creative problem solving, innovative and critical thinking (Araya, Peters, 2010; Kokavcová, 2012; Hlinka, 2013; Kotler, Caslione, 2016). Because of needs of current labour market and increased demands on creativity of human capital it is already necessary use in educational process methods, which could help future manager use his potential (Štefko, 2003, Zhylinska et al., 2020)

Student, future manager, could based on cognition of own learning style not only accept himself, but also have better time management by learning and develop his potential. With preference of learning style increases self-cognition of future economist or manager, too. Every of us prefers within learning style logical or creative thinking, concrete or abstract thinking, work in team or alone and other characterictics, which could impact on our future professional orientation. According to Mareš (1998) and Štefko et al. (2020) are learning styles analysis similar as the MBTI (Myers Briggs Type Indicator) typology: introversion (I) or extroversion (E), sensing (S) or intuition (N), thinking (T) or feeling (F) and judging (J) or perceiving (P), on this basis we could combine 16 different psychological profiles. Results of the MBTI test could have impact on professional orientation, too.

If individual knows characteristics, which are for him typical, he could make some work effective, productive and efficiently. Learning styles are based on cognitive styles. Research of both phenomenons belongs to the most important innovations of educational process, it highlights role of metacognition and metalearning. „The prefix meta- indicates a phenomenon of higher order, superior of phenomenon, which creates word root, e.g. metacognitive indicates „cogniting, how cognition runs“ and metalearning indicates „learn, how to learn“ (Mareš, 1998). To metacognition and metalearning could also belong methods for learning effectiveness improvement and mnemotchnical tools (e.g. mind maps, memory palace fast reading, Pareto rule 80:20) (Hlinka, 2013; Meurer et al., 2018)

Literature Review

Cognitive and learning styles in preparation of future managers

Cognitive and learning styles create the metacognitive potential of individual. „Cognitive style is way, which is preferred by reception and processing of information, is mostly innate, it is difficult to change it and it is little connected with content.“In contrast„ learning style is complex of procedures, which individual prefers by learning. It develops from innate basis, but in the lifetime it could change and improve...Individual doesn't mostly realize his learning style, thoughtfully doesn't improve and doesn't analyze it systematically…It is not simple to change them and they could be changed by himself or with help of social contacts (teachers, schoolmates, parents, etc.) (Petlák, 2012; Turek, 2008; Abedini, 2021). Learning styles could be divided according to many aspects:

According to brain hemispheres dominance – it is the most simple classification, which follows from researches of the American neuroscientist R. W. Sperry (Mikuláštík, 2010). Neuroscientist searched, that individual can use two independent ways of thinking and cognition. To the most significant features of the left hemisphere belongs verbality, logical and convergent thinking, racionality, analysis, in case of the right hemisphere it is non-verbality, creativity, divergent thinking, intuition and synthesis. Differences between hemispheres we can't consider as absolute because of variable level of individual's lateralization. Similar characteristics has also classification of learning styles into serialistic (methodical following in steps), holistic (systematic) and flexible (combination of serialistic and holistic style) (Edwards, 2012; Ali Taha, Tej, 2015; Rasmitadila et al., 2021; Steif, Alishah, 2021).

According to motivation and intention, resp. according to learning motivation we differentiate three basic approaches to learning: shallow (preference of external motivation), deep (preference of internal motivation and interest in learning) and strategic (performance-oriented, focused on the best result) (Mareš, 1998).

According to sense preference (VARK) is possible learning styles divide into: Visual – orientation in pictures, schemes and figures, Aural – listening to lectures, learning loud, Read/Write – good memory on read text, writing notices and Kinestetic – manipulation with tools, sense for pratical activities (Petlák, 2012; Kotevski et al.,2021).

According to prefered form of intelligence according to the theory of the multiple intelligence of Gardner (1983) we can differentiate 9 learning styles: linguistic (e.g. W. Shakespeare), logical – mathematical (e.g. A. Einstein), spatial – visual (e.g. P. Piccasso), physical – kinestetic (e.g. M. Jordan), musical (e.g. W. A. Mozart), interpersonal (e.g. M. Gándhí), intrapersonal (e.g. S. Freud), natural (e.g. G. Mendel) or existencial (e.g. Dalajláma) (Urban, 2003; Antonio, 2018; Miško et al., 2019).

According to connection of abstract and concrete thinking and random knowledge sorting – it is similitude of learning styles to four elements: concrete – sequence (earth: methodical procedures, sense for details), abstract – sequence (air: sense for theory and ideas), a abstract – random (water: preference of intuition) and concrete – random (fire: experiment and creativity) (Pike, Selby, 1988; Gullach, 2011; Hulaikah et al., 2020).

According to reality perception (concrete or abstract thinking) and way of information processing (observation or manipulation) is possible according to Kolb (1984) differentiate styles: Divergator (concrete, reflective, innovator) is typical by creative thinking, is curious, likes brainstorming and his professional orientation is focused on humanity or art sciences, counselling and human resources management. Assimilator (abstract, reflective, analyst) prefers ideas, theories and models more than people and his professional orientation is often focused on science and research. Convergator (abstract, active, practicioner) likes application ideas into practice, he has logical-mathematical thinking and his professional orientation is mostly focused on natural sciences, finance and accounting. Accomodator (concrete, active, dynamic) connects knowledge with application, he is ready for risk and implement plans, he needs freedom and his professional orientation is focused on business, services, marketing and innovations

(Turek, 2008; Cinová, 2013; Birkner, 2016; Colenci Trevelin, 2018; Meurer et al., 2018; Hulaikah et al., 2020).

Mareš (1998) claims, that exist also other classifications, which are little used in practice because of lack of standardized questionnaires and human individuality (e.g. according to gender differences and according to chronobiological preferences like „morning bird and night owl"). In research we will use classification according to D. A. Kolb.

Methods of creativity development in preparation of future managers

By learning styles identification we can find also differences in approach to creative methods. Currently is well-known, that creativity is not only privilege of geniuses, but it is ability, which has every of us, but by every of us is developed by different way (theory„the little c" – little creativity, resp. creativity, which we use everyday, not only in art or innovations) (Amabile, 2012). Creativity is composed of these features: include fluency, flexibility, originality, elaboration, and metaphorical thinking (Purnomo, Kristiansen, 2018; Supratman et al., 2021).

Mikuláštík (2010) and Ali Taha, Tej (2015) divide creative methods according phases of creative process: techniques focused on problem definition, techniques focused on ideas creation, techniques focused on ideas selection, techniques focused on ideas realization and techniques focused on processes. Based on theoretical background we can divide creative methods into two big groups: systematic-analytical (have exactly described structure and hierarchy, some of them are quantitative) and intuitive (methods of free ideas generation).

Overview of the most used creativity development methods according to authors like Kotler, Trias de Bes, 2005; Kloudová et al, 2010; Mikuláštík, 2010; Franková, 2011; Gullach, 2011; Kováč, 2012; Hlinka, 2013; Ali Taha, Tej, 2015; Dhir, 2016; Košturiak, 2016; Madzík, 2017; Palupi et al., 2020; Tumová, Demjanovičová, 2021) we sum in Table 1.

Table 1
Overview of systematic-analytic and intuitive creative methods

Systematic-analytical methods	Intuitive methods
• Zelina's DICER (in Slovak language DITOR) heuristic (Define problme, Inform about problem, Create solutions, Evaluate ideas, Realize ideas in practice) • morphological analysis (choosing of optimal combination of features of product innovation according to customers' needs, costs, technology etc. • method of analogy (e.g. human brain – computer) • method of aggregation (conncetion of many features into one entity– e.g. one pen with many colours) • method of desaggregation (diversification of one function into many partial functions – e.g. one flat on two floors) • method of dimension (miniaturizing, gigantizing) • method of kinematic reversal (reversal of kinematic functions e.g. stationary bicycle or escalator) **Methods used in industry engineering** • TOC – Theory of Constraints – finding of weakness in value chain, which causes ineffectivity • Six Sigma (systematic decreasing of deviations) • tool IDEO used in Sillicon Valley (Discovery, Brainstorming, Rapid Prototyping, Improvement, Implementation) • TRIZ (Russian – theory of innovative problem solving– problem specification, generalization, general problem solving, specific problem solving • method of competitive benchmarking (for finding of weaknesses, which could be used for innovative intentions)	• brainstorming, inverse brainstorming, brainwriting, • method 635 (6 participants, 3 ideas, 5 minutes) • lotus flower (further development of created ideas) • Delf method, • Ishikawa diagram, resp. „fishbone“ (analysis of reasons and consequences) • simulation methods, case studies • mind maps • memory palaces (creation of stories according to key words) • lateral thinking by 6 „Six thinking hats“ (Edward de Bono), which are represented by 6 colours (black, white, yellow, red, blue, green), every colour presents a different view on problem • Osborn's list and its structured form SCAMPER/SCAMMPERR (Substitute, Combine, Adapt, Modify, Magnify, Put to another use, Eliminate, Reverse, Rearrange) • Blue Ocean Strategy (new markets, individual marketing) • Bionics (finding of inspiration in nature and in living organisms – e.g. wings of planes vs. wings of birds)

Significance of methods outgoing from brainstorming (e.g. Osborn's list, SCAMPER) searched Ritter and Mostert (2018) and they found out, that between them isn't significant difference and ideas generation has impact on their originality. According to the authors the best creativity development methods should satisfy customers'needs. In research we would like to suggest some creativity methods according to main features of Kolb's learning styles.

METHOD

Aim of the research is to analyze preference of learning styles of future managers, to identify correlations between learning styles preference and chosen features of future managers, advantages and disadvantages of distance education and to suggest some possibilities of learning styles development by methods of creativity development. Based on this aim are formulated 3 hypotheses:

H1: We suppose significant correlation between learning styles preference of future managers and their perception of distance learning disadvantages.

H2: We suppose significant correlation between learning styles preference of future managers and their preference of chosen types of jobs.

H3: We suppose significant correlation between learning styles preference of future managers and their self-evaluation.

Main research material was standardized questionnaire of D. A. Kolb LSI IIA (Learning Styles Inventory), which was distributed to 296 future managers. Descriptive statistical data are calculated in Excel and inductive (hypotheses tests) in program SPSS.

Basic questionnaire LSI IIA is composed of 12 questions, within all are options A–D and respondent should to these options answer by following ways : strong disagreement (1 point), disagreement (2 points), agreement (3 points) and strong agreement (4 points). Then based on the questionnaire evaluation key we could set final score of learning styles preference (e.g. divergator = 35 points, assimilator = 17 points, convergator = 30 points, accomodator = 38 points). Then follows setting of absolute and relative number of learning styles in research sample.

Next research step was verification of statistically significant correlation between learning styles preference and perception of distance learning disadvantages (H1) at significance level 0,05. We also suppose, that divergators and accomodators consider distance eduaction worse that other learnign styles. Disadvantages of distance education has point distribution setted by following scales:

A) absence of team cooperation = divergator (from strong agreement = 4 points to strong disagreement = 1 point),

B) increased need of abstract thinking = assimilator (from strong agreement = 1 point to strong disagreement = 4 points),

C) increased need of individual study = convergator (from strong agreement = 1 point to strong disagreement = 4 points),

D) impossibility of practice and experiments = accomodator (from strong agreement = 4 points to strong disagreement = 1 point).

Then we searched correlation between final score of learning styles and of this question (e.g. divegator = 35 vs. A = 3, assimilator = 17 vs. B = 2, convergator = 30 vs. C = 1, accomodator = 38 vs. D = 4). For quantification of this correlation was used Pearson correlation coefficient.

Setting of statistically significant correlation significance level 0,05 between learning styles preference and professional orientation of future managers (H2) is based on theoretical issues. To standardized questionnaire was added one question focused on some job groups, which are suitable for graduates of economic and managerial study programms:

A) HR manager, employee education specialist, coach/mentor = divergator (from strong agreement = 4 points to strong disagreement = 1 point),

B) economy theorist, economic analyst, scientific employee– PhD. Student, assistant professor = assimilator (from strong agreement = 4 points to strong disagreement = 1 point),

C) accountant, financial manager, tax advisor = convergator (from strong agreement = 4 points to strong disagreement = 1 point),

D) marketing manager, PR manager, innovation manager = accomodator (from strong agreement = 4 points to strong disagreement = 1 point).

Then we searched correlation between final score of learning styles and of this question (e.g. divegator = 35 vs. A = 3, assimilator = 17 vs. B = 2, convergator = 30 vs. C = 1, accomodator = 38 vs. D = 4). For quantification of this correlation was used Pearson correlation coefficient.

Aim of the research was also search, whether exists statistically significant correlation between learning styles and chosen features of future managers – between learning style and self-evaluation in following additional question:

I think that I am: A) creative, B) theoretical, C) logical, D) practical ─ beacuse of nominal variable we would like to use non-parametic $\chi 2$- test with significance level 0,05 (H3). If p-values are lower than significance level (0,05), we could hypothesis confirm.

FINDINGS

Within the research sample composed of 296 future managers (D. A. Kolb – Learning Styles Inventory) prefer 109 (36,82 %) learning style „accomodator". It is active learning style, for which is more attractive practice than theory. We could say, that economical-managerial student programs are oriented to practice and they are suitable for future managers. On the seconds place are assimilators with number of 85 (28,72 %). In the research sample are 74 convergators (25 %) and they are good at exact and quantitative activities, e.g. at accounting. They are focused on tasks with one final solution. There are only 28 divergators (9,46 %). It is the rarest learning style in whole population with creative and divergent thinking. This thinking is worse developed in pedagogical practice than logical and it is decreasing in the adulthood (one of the factors is left hemisphere dominance in population).

H1: Between learning styles preference and distance education disadvantages perception is calculated weak correlation according to the Pearson ' s correlation coefficient with value r = 0,107. To these disadvantages belong: absence of team cooperation, increased need of abstract thinking, increased need of individual study and impossibility of practice and experiments. Learning style is way and strategy to better memorization. In distance education it is necessary to change these strategies and adapt to this change. In table 2 is shown this correlation.

Table 2
Correlation between learning styles preference of future managers and their perception of distance education disadvantages

	Correlation	Learning style	Disadvantages of distance education
Learning style	Pearson's correlation coefficient	1	0,107
	p-value	-	< 0,001
	N (Absolute number)	1184 (296 x 4)	1184 (296 x 4)
Disadvantages of distance education	Pearson' s correlation coefficient	0,107	1
	p-value	< 0,001	-
	N (Absolute number)	1184 (296 x 4)	1184 (296 x 4)

Based on data from table 2 we could sum that hypothesis H1: *„ We suppose stastictically significant correlation between learning styles of future managers preference and their perception of distance learning disadvantages.“* is **verified**. P-value is lower than the significance level (0,05). We could say, that perception of these disadvantages is connected with main features of learning style (e.g. for divergators is more difficult absence of team cooperation, for assimilators is suitable individual study because of higher level of abstract thinking, etc.).

H2: Between learning styles preference and preference of chosen groups of economic and managerial professions is is calculated weak correlation according to the Pearson ' s correlation coefficient with r = 0,108. Based on the methodology, preference of jobs groups is differentiated into 4 ares, which are typical by using of abbilities of learning styles: divergator, assimilator, convergator and accomodator. In table 3 is shown this correlation.

Table 3
Correlation between learning styles preference of future managers and their preference of chosen groups of economic and managerial professions

	Correlation	Learning style	Professional orientation
Learning style	Pearson' s correlation coefficient	1	0,108
	p-value	-	< 0,001
	N (Absolute number)	1184 (296 x 4)	1184 (296 x 4)
Professional orientation	Pearson' s correlation coefficient	0,108	1
	p-value	< 0,001	-
	N (Absolute number)	1184 (296 x 4)	1184 (296 x 4)

Based on data from table 3 we could sum, that hypothesis H2: *„We suppose stastictically significant correlation between learning styles preference of future managers and their preference of chosen types of jobs.“* is **verified**. P-value is lower than the significance level (0,05). We could say, that future managers choose their proffesions in areas, which are compatible with their thinking and abilities (e.g. analytical and practical learning style convergator is good at calculations, accounting and finance). On the other side on choosing of future professionalm orientation have also impact labour market situation, proximity to the place of residence, succession in family business, etc.

H3: We supposed statistically significant correlation between learning styles preference and self-evaluation. Everybody of us prefers some learning style, but our self-evaluation coulbe be different from Kolb 's test result. For example divergator is in theory characterized as „Creative“. Majority of divergators (12) think, that they are creative, other divergators marked other options (Theoretical, Logical, Practical), what more characterize other learning styles. This hypothesis deals with relation between 2 nominal variables and therefore is used the non-parametric $\chi 2$- test with significance level 0,05. If p-value is lower than 0,05, hypothesis is verified. Absolute and relative numbers of learning styles and self-evaluation are in table 4. Output from hypothesis test is in table 5.

Table 4
Learning style vs. Self-evaluation – absolute numbers

	Divergator	Assimilator	Convergator	Accomodator	Σ
Creative	12	19	14	40	85
Theoretical	3	7	11	11	32
Logical	2	23	33	18	76
Practical	11	36	16	40	103
Σ	28	85	74	109	296

Table 5
Correlation between learning styles preference of future managers and their self-evaluation

χ2- test (Chi square test)			
	Test value	Degrees of freedom	p-value
Pearson ' s χ2- test	32,788	9	< 0,001
N (Absolute number)	296	-	-

Based on data from table 3 and 4 we could say, that hypothesis H3*: „We suppose stastictically significant correlation between learning styles preference of future managers and their self-evaluation."* is **verified**. P-value is lower than the significance level (0,05). Based of verification of hypothesis we could say, that very important factor for application of research results in educational practice is, that self-evaluation is connected with results of questionnaire. If e.g. divergator thinks, that he is creative, it is more simple use in human potential development creative methods based on the „out of the box thinking". Finally we could say, that respondents answered responsible and that questionnaire has high reliability.

In managerial practice is very important creativity, which we could develop in presence and distance education by many ways, which are described in theoretical part. Within the research sample we could find representation of all learning styles. Therefore it is necessary to identify based on key features, which methods are suitable for all styles. For example we suggest to use these methods:

- for divergators we suggest to use methods based on free creation of ideas without barriers and criticism – so called „out of the box thinking", e.g. brainstorming, brainwriting, method 635, lotus flower (further development of main idea by next ideas), memory palaces, 6 thinking hats according to Edward de Bono, in context of their professional orientation preference are these methods most used in human resources management,

- for assimilators we suggest methods, which are typical with finding of analogies, ideas understanding and reading between lines, e.g. bionics, method of aggregation, desaggregation, dimensioning and kinematic reversal, because for them is suitable job in scientific-educational area, it is very interesting these methods use in publication and project activities,

- for convergators we suggest methods, which are typical by rationality and contain strict solution procedure, e.g. Ishikawa diagram, TOC (Theory of constraints) and competitive benchmarking, which could be helpful by finding weaknesses in comparison

to competitive business and then innovate them, these methods are quantitative and it is possible to use them in professions focused on finance, which they prefer,

- for accomodators we suggest methods, which are connected with practice and which motivate to experiments, e.g. SCAMPER, Blue Ocean Strategy and morphological analysis (finding of right combination of product parameters to satisfy customers, minimize costs, maximize profit, etc.), dominant professional orientation of accomodators is marketing, in which are these methods suitable to reach goals in target segment.

CONCLUSION

Aim of the contribution was to analyze learning styles preferences of future managers, to identify correlations between learning styles and chosen characteristics of future managers, advantages and disadvantages of distance eduacation and to suggest some possibilities of improvement of learning styles potential by creative methods. On the research sample composed of 296 future managers is dominant learning style „accomodator" with number of 109 (36,82 %), which is typical by high sense for concrete thinking and application theories into practice. Contribution contains 3 hypotheses, which were tested. Statistically significant correlation was setted between learning style and disadvantages of distance education perception, between learning style and professional orientation and between learning style and self-education of future manager.

Benefit of contribution are suggestions for possible human potential development based on diagnostics of learning style of future manager. Contribution has also value for self-knowledge of future managers and for possible innovations of educational process. Learning style diagnostics is possible use by choosing of economic or managerial specialization. Then is managerial practice effective and organizations have „competent people on suitable positions and job seekers could at the job interview identify their perosnal goals, strenghts and weaknesses. Research of learning styles of future managers has very big potential for educational and managerial processes and we would like to follow in research of this issues.

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