

8th ICEEPSY 2017
**The International Conference on Education & Educational
Psychology**

**LEARNING PATTERNS OF CZECH AND ROMANIAN STUDENTS
WITHIN THE CONTEXT OF AN CROSSCULTURAL
COMPARISON**

Kateřina Juklová (a)*, Jindra Vondroušová (b), Ramona Henter (c)

*Corresponding author

(a) University of Hradec Králové, Rokitanského 62, 50003 Hradec Králové, Czech Republic,
katerina.juklova@uhk.cz

(b) University of Hradec Králové, Rokitanského 62, 50003 Hradec Králové, Czech Republic,
jindra.vondrousova@uhk.cz

(c) Transilvania University of Brasov, Bulevardul Eroilor 29, Braşov 500036, Romania, ramona.henter@unitbv.ro

Abstract

International comparison represents useful perspective on academic learning in today's globalized world. Eastern European countries however so far have not figured in international comparisons of higher education much. The aim of the study was to fill an empty space on an imaginary map of academic learning and add results of students from two countries of the former Communist bloc, to gain new understanding of the current state of learning of university students from different countries and indicate impulses for further development. The Inventory of Learning Styles (Vermunt, 1996), measuring student learning activities, regulation strategies, conceptions of learning, and learning orientations, had been used to measure learning patterns. Identified learning patterns of Czech and Romanian students were compared with each other as well as with the results of previous studies using the same instrument (e. g. Marambe et al., 2012; Vermunt et al., 2014). Both quantitative and qualitative differences between learning patterns of Czech and Romanian students were interpreted in the broader context of the environment using the Hofstede's cultural dimensions theory. Results indicate the need for caution when interpreting differences in learning patterns among countries as they can not only be the product of culture difference, but also a consequence of semantic changes in the meaning of the instrument items caused by translation. For a more reliable interpretation, there is a need to test models' invariance using a CFA across all groups before comparing learning patterns internationally.

© 2017 Published by Future Academy www.FutureAcademy.org.UK

Keywords: Learning patterns, crosscultural differences, comparison



1. Introduction

Academic learning has been a permanent focus of providers of higher education for many decades. Contemporary authors focused on learning point out, among other things, the need to understand the main components of effective learning and to deepen the knowledge about their functioning and mutual relations (e.g. Gijbels et al., 2014). International comparisons are one useful perspective on learning processes and results in the currently globalised world. This perspective enables one to see learning results and processes in a wider context and helps put them in context with the environment in which they were formed.

2. Problem Statement

In 2012, Maramble et al. published a meta-analytical, cross-cultural study of students' learning patterns in higher education that summarised and compared the results of using the ILS questionnaire to test students' learning patterns from two Asian countries (Indonesia and Sri Lanka) and the Netherlands. In the same spirit, the study was expanded upon two years later by Vermunt et al. (2014) who added the results of students from Spain, three Latin American countries (Colombia, Venezuela and Mexico) and Hong Kong to the comparison. The comparison results not only showed numerous, statistically significant differences between the nations on the questionnaire's individual scales, but also significant differences in the mutual relations between the individual dimensions across different cultures, which seem to be interpretable in terms of the cultural differences of the individual nations. These results attest to the fact that culture not only produces differences in learning results and learning strategies, but also unique compositions of relations between the individual elements of academic learning. The Czech Republic, Romania and other countries of the former Eastern Bloc have been mostly absent from international comparative studies of higher-education learning. Even though they are located on the same continent, they can be very different from each other in terms of cultural dimensions.

3. Research Questions

Within the framework of this study we pose the following research questions: (1) To what extent are Czech students different from their Romanian counterparts and students from other countries and continents in terms of their learning orientations, learning conceptions and learning strategies? (2) What learning patterns can be seen in Czech students compared to Romanian students and students from other compared countries? (3) Can a satisfactory explanation be found for the identified differences within the context of the existing knowledge of cultural specifics?

4. Purpose of the Study

The objective of this study is to complement the current state of knowledge of intercultural differences in academic learning with two European countries, the Czech Republic and Romania.

5. Research Methods

5.1. Research Sample

Two research subsets of higher-education students participated in the testing of learning patterns, Czechs (N=878) and Romanians (N=150). Furthermore, the results presented in the study by Vermunt et al. (2014) were included in the meta-analysis.

5.2. Method

To cover the learning patterns, the Czech version of the Inventory of Learning Styles (Vermunt, 1996), translated and adapted by Mareš (1996), was used. Vermunt's theoretical framework contains four domains, within the framework of which we can find a total of 16 scales, two of which are further divided into two sub-scales (i.e. 20 scales in total). These domains cover cognitive processing strategies that students use when working with educational materials to achieve learning objectives; meta-cognitive regulation strategies focused on the regulation of cognitive activities; learning conceptions representing students' beliefs about herself/himself as a learner, about teachers, and about learning processes, objectives and tasks; and learning orientations containing personal objectives, motives, expectations, attitudes, concerns and doubts during instruction (Vermunt, 2004).

Since 2004, there have been many research studies carried using the questionnaire and producing new findings about academic learning patterns in relation to personality traits, environmental factors, their development over time, and changes brought about by the influence of various interventions (Vermunt & Donche, 2017). The links between the individual components have also been investigated. Using regression analysis, Vermunt (2004) identified the relations between dimensions. He found the learning strategies used by students during the learning process are regulated by meta-cognitive strategies, which in turn are affected by the students' learning conceptions and motivations. These learning patterns lead to learning results and are also affected by various personal and contextual factors. As a result of interaction between personal and contextual factors learning patterns are understood as a dynamic characteristic (Vermunt & Donche, 2017).

Research into student learning repeatedly identified four qualitatively different patterns in the way students learn. In the first one, reproduction-directed learning, students strive to pass their studies (tests) or to test their own abilities. For that purpose, they mainly use memorisation and gradual analysis as learning strategies, usually without thinking within a certain context or looking for much meaning. They usually let their learning be regulated by other external agents (teacher, textbook). In comparison, meaning-directed learning represents a deep approach towards learning. It is characterised by an effort to comprehend, to understand the context and to structure the instruction material into a whole, and by critical thinking. Such students usually manage their learning activities on their own and feel responsible for the management of their learning, which they most often view as an independent building of knowledge. A strong personal interest is also present in them. The third factor is called application-directed learning, and students in which this pattern prevails look for connections between what they are learning and its possible practical use. Their learning can be regulated either by themselves or by other, external agents. They place great value on knowledge that they can use, and they tend to be vocation-

oriented. The last learning pattern is undirected learning, typical for students transferring from one educational level or environment to another. It is characterised by a lack of regulation, ambivalent learning orientation, and concepts which emphasise stimulation by education or co-operation.

5.3 Procedure and Analysis

The assumptions for testing statistically significant differences between two groups of students were taken from Hofstede's cultural dimensions theory (2010). Both tested subsets were first subjected to a descriptive analysis, and a reliability test (Cronbach's alpha) was carried out for separately for Czech and Romanian all 20 questionnaire scales/sub-scales. Next, the average values of all 20 scales/sub-scales were calculated. These values from the Czech and Romanian subsets were compared in terms of the statistical significance of the differences. Subsequently, the data from Czech and Romanian students was included in the meta-analysis, together with students' data from the countries investigated by Marambe et al. (2012) and Vermunt et al. (2014). In this part of the study, procedure in accordance with the aforementioned authors was applied. To compare the value of significance, Bonferroni corrections were made and Scheffé's post-hoc tests were done. To determine the size of the effect in accordance with the aforementioned authors, Cohen's kappa was employed as well.

6. Findings

6.1. Intercultural differences between Czech Republic and Romania

Assumptions of expected Czech – Romanian students' differences were created within the context of Hofstede's cultural dimensions theory (2010) distinguishing six areas in which cultures at the national level can be compared. Table 1 summarises the results of the comparison between the two nations in terms of these six dimensions.

Table 01. A Comparison of Indexes of the Czech Republic and Romania Obtained within the Framework of Hofstede's Six Dimensions

Dimension	Romanian Indexes	Czech Indexes	Difference Magnitude	Minimum	Maximum
Power Distance	90	57	33	104	11
Individualism	30	59	29	91	6
Masculinity	42	57	15	110	5
Avoidance of Uncertainty	90	74	16	112	8
Long-Term Orientation	52	70	18	100	0
Indulgence vs. Restraint	20	29	9	100	0

Compared to Romania, the Czech Republic seems quite different in its cultural dimensions, especially in four of them. The most marked difference was found in the Power Distance and Individualism dimensions (with differences of 33 and 29 points, respectively). In terms of the results of the first dimension, we can expect relatively significant differences within the school context. In Romanian students, one can expect a teacher-oriented system of education, with lectures prevailing over seminars, greater respect shown to the teacher, and less room for independent activities by students.

These aspects could lead to students having a higher preference for gradual and concrete processing of information over deep processing. Due to the Romanian students' high score on the Power Distance scale and simultaneously their low score on the Individualism scale, we further expect parents to play a significantly greater role in the students' choice of profession and institute of higher education, and as a result of this, a lower level of personal interest and vocation orientation and a greater orientation towards a certificate, self-affirmation and ambivalence. Furthermore, due to the relatively low Masculinity index in Romanian students, we can expect a higher tendency towards adaptation, an emphasis on acceptability and co-operation, stronger external regulation, and a tendency towards co-operation. The aforementioned comparison creates pre-requisites for intercultural differences in all domains, and therefore all sub-scales were included in the testing differences.

6.2. Czech-Romanian Comparison on ILP Sub-scales

Due to doubts about the normality of data distribution from both cohorts, the non-parametric Mann-Whitney U test was used for comparing the differences in the scales. However, as it compared ranks, and not averages or modi, the table below contains a combination of outputs from an Independent-Samples T-test and the Mann-Whitney U test. Both tests came to the same conclusion: statistically significant differences in the Czech and Romanian groups were identified on 16 of the 20 scales/sub-scales (all except Memorising and rehearsing, External regulation-results, Personally interested and Vocation-oriented). Looking at the mean scale values of both groups, we surprisingly find Romanian students scoring significantly higher on the same 16 of the 20 scales/sub-scales, which is in contradiction to our assumptions based on Hofstede's theory.

Table 02. Czech-Romanian Comparison on ILP Sub-scales

	Romanian (N=150)		Czech Republic (N=878)		p
	M	SD	M	SD	
Relating and structuring	3,7352	,54803	3,3250	,71507	***
Critical processing	3,3750	,70339	2,6629	,86061	***
Memorising and rehearsing	3,1680	,79193	3,2672	,70246	
Analysing	3,4889	,57042	2,8296	,67840	***
Concrete processing	3,8293	,58546	3,2985	,72578	***
Self-regulation – process and results	3,7048	,57755	2,9576	,71359	***
Self-regulation – learning content	3,4433	,69221	2,9806	,87145	***
External regulation – process	3,2322	,65592	2,8217	,63664	***
External regulation - results	3,3787	,59580	3,3461	,65650	
Lack of regulation	3,1556	,62231	2,7012	,71884	***
Personally interested	3,5547	,63969	3,6555	,71095	
Certificate-oriented	3,3253	,78631	3,0985	,72870	**
Self-test-oriented	3,6467	,68480	3,3287	1,04433	***
Vocation-oriented	4,2400	,59438	4,2099	,61390	
Ambivalent	2,5213	1,00893	2,1297	,89191	***
Construction of knowledge	3,9726	,53449	3,6098	,58860	***
Intake of knowledge	3,6904	,62359	3,3380	,59960	***
Use of knowledge	4,1444	,53951	3,9228	,62503	***
Stimulating education	3,8600	,69059	3,5655	,61721	***
Cooperative learning	3,4250	,87098	2,8017	,87970	***

*p<.05, ** p<.01, *** p<.001

To get more understanding, we will check factor structure differences of both Czech and Romanian samples.

6.3 Czech-Romanian Factor Structure Comparison

As can be seen from Table 3 below exploratory factor analysis using varimax rotation revealed different factor structure of both samples. With regard to the Czech students, we obtain a structure similar to that described by Vermunt et al. (2014) for Dutch students: the meaning-directed dimension, in which scales of deep processing, self-regulation and construction of knowledge as a learning conception are grouped. This finding indicating that within the group of Czech students, this dimension describing learning strategies is also related to certain beliefs about learning is in accordance with Vermunt's findings about Dutch students. Within this first dimension in the Czech group, the scales of concrete processing and stepwise processing also appear. This can be explained by the fact that within the framework of the investigated set of data, which exclusively included teachers-to-be, concrete thinking is very important for their work. Analysis is also considered to be an initial stage of deep cognitive strategies. In the case of the Romanian students, both sub-scales of external regulation and stepwise processing are grouped within the framework of this first dimension. It seems that students do not distinguish between deep and surface processing of information or between external and internal regulation; they perceive both as part of the learning process. Here it may be possible to find the consequences of an intercultural difference, within the framework of which Romanian students are, as expected, accustomed to consuming more frontal instruction and consider self-regulation to be as important as external regulation.

Table 03. Czech-Romanian Factor Structure Comparison CZ = Czech students; RU = Romanian students

	Factor I		Factor II		Factor III		Factor IV	
	CZ	RO	CZ	RO	CZ	RO	CZ	RO
Processing strategies								
Relating and structuring	,744	,518						
Critical processing	,752	,713						
Memorising and rehearsing		,336			,630			
Analysing	,642	,828						
Concrete processing	,558					,472		
Regulation strategies								
SRL – process and results	,705	,603						
SRL - learning content	,503	,612						
ERL – process		,390			,559			
ERL - results		,449			,502			
Lack of regulation				,418			,603	
Learning orientation								
Personally interested			,550	,418				

Certificate-oriented				,839	,401			
Self-test-oriented			,349	,707				
Vocation-oriented			,611			,596		
Ambivalent				,672			,665	
Conceptions of learning								
Construction of knowledge	,632					,711		
Intake of knowledge					,623			,733
Use of knowledge			,669			,762		,575
Stimulating education			,457					
Cooperative learning							,458	

The second dimension, called the **passive-idealistic learning pattern** by the authors, is aptly named in the case of the Czech subset, as it applies to some other countries found by Vermunt et al. (2014) as well, as it groups neither the scales of processing nor of regulation strategies, but only of learning orientations and learning conceptions. In the case of the Czech group, it expresses strong vocational orientation, personal interest and a belief in applied education. In the case of the Romanian group, we encounter a phenomenon known as the passive-motivated learning pattern, in which the learning-orientation scales (except for vocation-oriented) are grouped with a lack of regulation (Vermunt et al., 2014).

The third dimension in Czech students corresponds to Vermunt's **reproduction-oriented learning pattern**, which groups the scale of memorising and rehearsing with both sub-scales of external regulation, the use of knowledge as a learning conception, and a certificate-oriented learning orientation. In the case of Romanian students and the third dimension, we obtain a vocation-oriented pattern which groups concrete processing with beliefs in the construction of knowledge, its use and its vocational orientation.

The fourth dimension in Czech students is again identical to a dimension identified in Dutch and Finnish students called the **undirected learning pattern**. In the case of Romanian students, factor II corresponds to this pattern, which, however, is unexpectedly related to personal interest. The fourth dimension of the Romanian students contains only two items, intake of knowledge and use of knowledge as learning conceptions.

6.4 Comparison of Czech and Romanian Students with the Results of Other Studies

An ANOVA meta-analysis confirmed statistically significant differences between the compared countries on all scales. A comparison of factor loadings of Czech and Romanian students within the context of other already investigated countries also showed significant differences. When looking at the factor loadings of the individual scales of Czech and Romanian students compared to other groups, it is possible to compare the group of Czech students to that of Dutch students.

On the other hand, the interpretation of the factor analysis for the group of Romanian students is problematic. Here we find these differences: the first (meaning-oriented) dimension in Romanian students, similarly to students from Hong Kong and Indonesia, includes both deep and surface learning

strategies, while, similarly to Indonesia and Mexico, it shows external regulation in learning alongside self-regulation strategies.

7. Discussion

Within the framework of this study, we asked the following questions: (1) To what extent are Czech students different from their Romanian counterparts and students from other countries and continents in terms of their learning orientations, learning conceptions and learning strategies? (2) What learning patterns can be seen in Czech students compared to Romanian students and students from other compared countries? (3) Can a satisfactory explanation be found for the identified differences within the context of the existing knowledge of cultural specifics?

In a comparison across 20 sub-scales of ILP, Czech and Romanian students seem significantly different, while, contrary to the expectations derived from Hofstede's cultural dimensions theory, Romanian students score higher on 18 scales, of which 16 scales show significant differences. According to expectations, the ANOVA meta-analysis results confirmed significant differences on all scales between the compared countries.

When looking at the factor structure of the scales of Czech and Romanian students compared to other groups, the subset of Czech students is comparable to that of Dutch students. Interpretation of the factor analysis for the Romanian students is problematic: the first (meaning-oriented) dimension in Romanian students, similarly to students from Hong Kong and Indonesia, includes both deep and surface learning strategies, while, similarly to Indonesia and Mexico, it shows external regulation in learning alongside self-regulation strategies. Other factors are much less obvious and difficult to interpret meaningfully. The reproduction-directed learning dimension hardly exists in the minds of Romanian students, and the passive-naive learning dimension unexpectedly contains the Personal Interest scale. It is difficult to reliably conclude what is behind these results. The fact that there is no distinction between deep and surface learning strategies or between external and internal regulation in the Romanian group as well as the fact that student behaviour (i.e. regulation and cognitive processing strategies) are not closely related to what students think about learning are obvious. This result could be caused by the fact that for Romanians, as well as for students from countries with a higher Power Distance index and a lower Individualism index compared to the Czech Republic and the Netherlands, it can be problematic to "not agree" with a questionnaire item. This phenomenon was also observed by Vermunt et al. (2014) in students from Colombia, Spain, Hong Kong and Indonesia. However, another possible explanation could be the fact that through translation, the meaning of individual items was changed, which may have resulted in their being higher scores overall on all questionnaire items. These interpretation difficulties are strong argument for model invariance testing of the compared data groups. Without confirmed model equivalence comparison of the results on scales can bring misleading and confusing results.

Assuming at least partial (scalar) equivalence of both Czech and Romanian samples with measured construct, factor analysis outcome can bring more clarity to our interpretation. In the case of Czech-Romanian comparison, the factor structure showed several differences in students' behaviour and beliefs about learning. For instance, one of them is the relationship towards surface learning strategies and the

regulation of learning. It seems that in some cultures (countries), there is no distinction made between these two, and “lower” strategies (memorising and rehearsing, analysing, external regulation) are logically an initial stage for the higher ones (relating and structuring, critical processing, self-regulation. Another one is the link between behavioural characteristics and motivational and cognitive characteristics. It seems that a direct link between the index of the cultural dimension and learning behaviour or beliefs about learning is probably not valid; however, culture can have an impact on the formation of a certain way of thinking about learning and the extent to which it is reflected upon. This could be the cause of the differences in comprehending the individual questionnaire items that influence the answers to them. All these facts point to the need for more detailed testing of learning-pattern models before comparing them internationally. |

8. Conclusion

| The objective of this article was to compare learning patterns in Czech and Romanian higher-education students and to interpret them within the context of Hofstede’s cultural dimensions theory and with regard to selected comparative studies based on the same instrument. The groups were compared quantitatively and qualitatively. For the quantitative comparison, the average scores of both groups of higher-education students on 20 scales/sub-scales were used and were compared using a t-test. Subsequently, a ANOVA meta-analysis of all results was carried out to compare Czech and Romanian students with other, already analysed countries. The results confirmed significant differences not only in the comparison of Czech and Romanian students with other students, but also between these two countries. Contrary to expectations, Romanian students scored higher than Czech ones on 19 out of 20 scales, with the differences being significant on 16 scales. To interpret these results, we also used the results of a qualitative comparison, using exploratory factor analyses with varimax rotation of 20 sub/scales. Save for a few exceptions, in the case of the Czech students, a high concordance was found with the factor structure discovered by Vermunt et al. (2014) in the sample of Dutch students. It turned out to be problematic, however, to interpret the factor structure in Romanian students. This result could be a consequence of cultural differences, but also of semantic changes in the meaning of the measured questionnaire items caused by translation. For a more reliable interpretation, this finding will have to be complemented with a test of model invariance using a CFA across the groups. |

References

- |
- Gijbels, D. et al. (2014). Students’ learning patterns in higher education and beyond: Moving forward. In Gilbels, D., Donche, V., Richardson, J.T.E., Vermunt, J. (Eds.). *Learning patterns in higher education*. Routledge, New York, pp. 1-8.
- Hofstede, G., Hofstede, G.J., Minkov, M. (2010). *Cultures and Organizations. Software of the mind*. Mc Graw Hill.
- Maramble et al. (2012). A cross-cultural comparison of student learning patterns in higher education. *Higher Education*, 64, pp. 299-316.
- Vermunt, J., Vermetten, Y. J. (2004). Patterns in student learning: Relationship between learning strategies, conceptions of learning, and learning orientations. *Educational Psychology Review*, 16/4, pp. 359-384.

- Vermunt, J. et al. (2014). The dimensionality of student learning patterns in different cultures. In Gilbels, D., Donche, V., Richardson, J.T.E., Vermunt, J. (Eds.). Learning patterns in higher education. Routledge, New York, pp. 33-55.
- Vermunt, J., Donche, V. (2017). A Learning Patterns Perspective on Student Learning in Higher Education: State of the Art and Moving Forward. Educational Psychology Review, 2017. Review Article. DOI 10.1007/s10648-017-9414-6.]