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How do University Students Learn: Learning Styles and Approaches in the Context of Subjective Quality of Higher Education Teaching and Learning Effectiveness

Abstract

This paper examines the styles and approaches to learning in contemporary higher education students. These individual characteristics are seen as results of the interaction between student individuality and the learning environment stimuli. The presented research is based on the assumption of existing interactions among the nature of study environment, the student's approach to learning and his/her study effectiveness. Research results confirm this assumption and enable to analyze findings in the context of a specific learning environment.

Keywords: *learning, university student, learning style, learning approach, quality of higher education, learning effectiveness*

Introduction

University studies are supposed to be preparing for a career or job. But the tradition of higher education contains also general education goals (Chlup, 1967). A university graduate should, in addition to a specialized knowledge, have a broader cultural vision and a tendency to continuous self-education. According to Wankowski (1991), one of the general objectives of university education is to develop learner independence. This independence (autonomy) relates to the choice of strategies, means, and contents as well as to the ability to assess one´s own knowledge and skills in a given sphere (Janíková, 2007).

There is the question of to what extent the current system of university education supports its development. Autonomy and the general culture student today is rather a by-product and goal of a contemporary pursued higher education. The main proof of educational success is an electronic summary of the ratings, using classification. Whether such a professionally equipped graduate is prepared not only for the labor market, but also supported in his/her cultural development, cannot be reliably identified on the basis of this summary.

The process, the end of which is a university graduate, is influenced by more factors. They are the content of the curriculum, intellectual, as well as other incentives, and the level of teaching requirements. On the part of the learner it requires not only intellectual ability but it is also significantly influenced by his/her mental toughness and personality as a whole (Cassidy & Eachus, 2000). In the course of their study, students proceed in various ways. In the case of university students, whose significant proportion of work is self-study, individuality becomes more important. However, is it possible to say that there are learning patterns which are more efficient in terms of study quality? Could these characteristics be prerequisites of fruitfulness found? Or are these rather a by-product resulting from the effect of the learning environment on individuals?

The starting point for the answer to these questions is a reflection on the concepts of learning styles, approaches and results as factors influencing each other. The framework within which these interactions happen is the learning environment which, by means of its values and goals, significantly influences all the interactions (Mesick, 1987). In compliance with Honey & Mumford (1992), we consider **learning styles** as a description of the attitudes and behaviours which determine an individually preferred method of perception, imagination, memory, problem solving and thinking (Řehulková, 2007). If individual specialities in cognitive processes are connected with motivation, we use the expression "**approaches to learning** or **strategy"** (Entwistle, 1981). According to Diseth and Martinsen (2003), approaches to learning represent individual specialities in intents and motives in the course of learning situations and in the use of corresponding strategies. **The deep learning approach** tends to understand the studied material, and is motivated by interest in a subject. In this process of study, facts are used and thoughts are operated with. The **surface learning approach** prefers mechanical processing and reproduction of the subject matter studied. The primary motive in this approach is to avoid failure and problems. The intention of **the strategic learning approach** is to obtain the best possible grades. Users of this approach try to achieve this aim by means of any adaptation to evaluating requirements. In compliance with these requirements, these individuals plan

their time and ways of using intellectual resources. Their primary motive is to compete with others.

As for the relation to learning results, there is one more significant difference between the concept of learning styles and learning approaches. Messick (1987) found that cognitive styles together with locus of control and the need to cognise are fundamental and relatively stable aspects of individual particularities within the meaning of the style of information processing and motivation, while approaches to learning may, to a greater extent, be influenced by the context within the meaning of adaptation to the actual requirements of the learning environment. Similarly, Riding and Rayner (1998) stress the stability of styles, nevertheless they admit that some learning strategies and problem-solving strategies can develop as a response to the requirements of the environment. In their research, Diseth and Martinsen (2003) confirmed the relationship between the **deep approach to learning,** motivation for success, and the need to cognise, as well as the connection between the **surface style,** the predominance of assimilation and motivation, and motivation to avoid failure; the relationship between the **strategic approach to learning,** the predominance of exploration, motivation for success and the need to cognise.

The above discussion shows an important relationship among learning approaches, learning outcomes and the learning environment. The goal of the presented research was to chart the distribution of learning approaches in a selected sample of UHK students and analyze them in the context of the subjective quality of higher education teaching and effectiveness of learning. To determine the quality of teaching and the effectiveness of student learning, subjective student responses were deliberately chosen. This is due to the unavailability of reliable objective indicators of student effectiveness (see above). Subjective student responses bring better insight into their way of thinking, on the other hand we are aware of the limitations, which lie in the lack of "external" criteria.

Research Methodology

For the diagnostics of learning styles, an originally Dutch questionnaire, called **Inventory of Learning Styles (ILS)** (Vermunt, Van Rijswijk, 1987), was used (Czech version by Mareš, 1995). According to the author, the ILS items are supplied by four factors: curriculum processing, learning process control, motivation to learn, and approach to the curriculum, and each of these factors is further divided into 5 variables: **the curriculum processing factor**: searching for relationships and structuring, critical activity and independence, memorising and recollecting,

analysing plus concretising and giving a personal sense; **the learning control factor**: auto-regulation of the course and results of learning, auto-regulation of the content aspect of learning, external regulation of the course of learning, external regulation of learning results, and absence of control focused on problems; **the motivation to learn factor:** obtaining a diploma, occupational motivation, self-testing and testing one´s own abilities, personal interests and preferences, and ambivalent motivation; **the approaches to learning factor:** absorbing knowledge, constructing knowledge structures, using knowledge, stimulated self-education, and co-operation.

Another instrument used in the research was a questionnaire of our own design, which was called **Evaluation of higher education teaching by the student**. Its inclusion in the test battery was motivated by the need to obtain data on the character of the learning environment. For this purpose, we also included items inspired by the work of Vaněčková (2007), who was engaged in research into the evaluation of higher education teaching. The final form of the questionnaire administered included 36 statements assessed on a five-point Likert-type scale.

To assess student learning effectiveness, a 15-item questionnaire, called **Evaluation of One´s Own Learning,** was designed. The wording of individual items was inspired by the General Perceived Self-Efficacy Questionnaire (Jerusalem, Schwarzer, 1999, Czech translation by J. Křivohlavý in Hoskovcová 2006), which is derived from Bandura's concept of self-efficacy.

The quantitative processing of both the questionnaires was carried out in the SPSS and NCSS programmes. For the analysis of the psychometric characteristics of both the questionnaires, we used the factor analysis methods without factor rotation, and the methods of descriptive statistics (arithmetic mean, median, and standard deviation). For the analysis of the mutual relationship of learning styles and approaches to other concepts, the methods of cluster analysis, analysis of variance, correlation calculation, and chi-square were used.

The research comprised 207 students at the University of Hradec Králové in various fields of Bachelor´s study of which women formed 59 % (N = 121), and men 41 % (N = 86). As far as the length of study is concerned, the students were divided into two groups, i.e. 1st year students (43%) and 2nd and 3rd year students (57%). Another research sample characteristic was the inclusion of in-service trained students (21%, N=44, with average age 42). The total number of included subjects of study amounted to 26, and for a brief overview, they were categorised into five groups: social sciences and linguistic disciplines (15%), IT (42%), natural sciences (7%), artistic disciplines (3%) and educational and teaching-oriented disciplines (33%).

Results

The factor analyses of ILS reduced the factors to four. They already combine the preferred manner of processing, motivation, and the dimension of dependence on/independence from external control in learning. **A systematic approach** factor connects careful work with information, interest in theory, openness to cognition, and prevailing auto-regulation; **practicality** presents the tendency to memorise the material with a pronounced professional orientation, high practicality, prevailing external regulation in learning, and frequent co-operation; **learning difficulties** connect a fear of failure, orientation towards obtaining a diploma, feeling of failure in study, and absence of control; and **neutrality** describes an individual with a tendency to neutral professional orientation, managing the subject matter rather by memorising with a desire for cognition.

The paired t-test method showed differences in the scoring of the monitored students. In the **systematic approach** factor**,** the UHK students under 24 years of age scored low compared to older students ($F = 4.921$; $p < 0.05$, $n = 207$). Similar results were obtained in the **neutrality** factor, where the students over 24 years of age scored significantly higher in comparison with the students under 24 ($F = 7.299$; $p < 0.01$, $n = 207$). In the **practicality and professional orientation factor,** the 1st year students scored significantly lower compared with the 2nd and 3rd year students ($F = 6.696$; $p < 0.01$, $n = 207$). In the **systematic approach,** men scored significantly lower than women ($F = 6.512$; $p < 0.05$, $n = 207$).

Cluster analysis isolated several personality types: **an Easy-going person,** markedly below average in the systematic approach and in auto-regulation, still professionally unspecific, but without serious difficulties in learning; **a Theorist,** highly above-average scoring in the analytical and systematic approach and in auto-regulation, using mechanical learning at an average level, without learning difficulties and strongly specific about his/her field of study; **a Practitioner**, scoring at an average level in the systematic approach, above-average in the practical and mechanical approach, but unspecific in professional orientation and with studying difficulties; **a Person Unsuccessful in study,** average in the systematic approach, highly unpractical, above-average in non-specific orientation and with serious studying problems. As shown by the analysis, all the four types of students exist in our research sample. The practitioner is the type with the relatively highest incidence (38%), and the theorist is the type with the lowest incidence (17.4%). The easy-going type is represented by more than a quarter of all the surveyed students (26%). The finding that nearly 18% of the students have serious studying difficulties is also an important fact.

The calculation of chi-square revealed an important difference in the distribution of the students according to their age. The students under 24 years of age are significantly more represented in the **Easy-going** and **Theorist** types, and less in the **Unsuccessful in study** type; the students over 24 significantly more often represented the **Practitioner** and **Unsuccessful in study** types ($\chi 2=8{,}108$; df=3; $p < 0.05$, n = 207). Men were significantly more often present in the **Easy-going** and **Theorist** types, and women in the **Practitioner** type ($\chi 2=13.51$; df=9; $p < 0.05$, n = 207). The students in their first year of study to a greater extent inclined towards the **Easy-going** and **Theorist** type, while the students in the second and third years of study were more frequently represented in the **Theorist** and **Practitioner** types ($\chi 2=8{,}045$; df=3; $p < 0.05$, n = 207) .

With the use of factor analysis of the **Evaluation of higher education teaching by the student** questionnaire one factor, saturated by 19 items and showing high reliability (Cronbach's alpha= 0.90), was extracted and was called *perceived quality* of *teaching*. The arithmetic mean of the factor obtained in the evaluation on a 5-point scale was 2.1652, which means that the students assessed the quality of teaching, on a 5-point scale, using the expression of regular school classification, as very good. Most favourably evaluated items were: "Exam requirements are set in advance," "Teachers are open to communication and co-operation," and "Teaching is professional." Teachers are perceived as professionals characterised by correct conduct, willingness to help and providing teaching at a professional level. They are least favourably evaluated in regularly provided feedback, in the adequacy of requirements, and in the mediation of study materials. The most frequent answer to these items was 3.

The correlation analysis has shown that the students under 25 evaluate teaching less favourably compared with the older students ($r = -0.24$). The ANOVA method also detected statistically significant differences from the point of view of the field of study ($F = 3.75$, $p < 0.01$, n = 207).

Factor analysis of the **Evaluation of One´s Own Learning** questionnaire extracted one factor called *subjective effectiveness of learning* saturated by 15 items (Cronbach's alpha = 0.91). The total arithmetic mean of all 15 items was 2.70. Most favourably evaluated statements related to one´s own learning are shown in Table 1.

Table 1. Most favourably evaluated items of the *subjective effectiveness learning* factor

Items	Ar. mean	Std.
44. I am convinced that I will master the requirements of my future profession.	2.3333	0.9348

Items	Ar. mean	Std.
42. I am satisfied with the knowledge and skills which I am obtaining in my course.	2.3913	0.9737
43. If I make the necessary learning effort, I will be able to resolve nearly every problem.	2.4300	1.0537
47. I am convinced that I will assert myself in practice thanks to my course.	2.4686	1.1773

On the contrary, the least favourable evaluation by the students is related to the following statements:

Table 2. Least favourably evaluated items of the *subjective effectiveness learning* factor

Items	Ar. mean	St. deviation
37. Learning is easy for me.	3.1643	1.0803
35. Teachers help students to improve their learning style.	2.8551	1.0831
38. My learning method is effective.	2.8261	0.8970

Statistically important differences were found in the evaluation of the subjective effectiveness of learning from the point of view of age. Similarly to the factor of the perceived quality of teaching, the group of students under 24 was more critical in comparison with their older colleagues, who, as a rule, studied in combined forms of courses, and whose average age was 37 ($r = -0.31$).

Correlation analysis confirmed a statistically significant positive relationship between the *perceived quality of teaching* and the *subjective effectiveness of learning* ($r = 0.42$). The students who perceived teaching as having a high quality were, at the same time, satisfied with the effectiveness of their own learning, and vice versa.

All the four types coming from the ILS questionnaire analysis were compared in terms of their subjective evaluation of learning effectiveness ($F = 6.834$; $p < 0.01$, $n = 207$). One´s own learning was perceived as most effective by the Easy-going person type, then by the Theorist type, then the Unsuccessful in study type, and an abysmal gap is found between the above-mentioned ones and the Practitioner type.

Discussion

The UHK students differ in the degree of systematic approach, criticality, and auto-regulation, in the degree of practical orientation, professional specificity, and

in the degree of perceived difficulties in studying. Personal immaturity and professional vagueness is more attributable to the students under 24 years of age, but not exclusively. On the contrary, a systematic approach is significantly more frequently preferred by the older students and women.

The distribution of the UHK students into individual types indicates that the largest part of the monitored students (40%) is practically focused and application-orientated. Unfortunately, at the same time, the students of this type mostly choose mechanical processing, which brings about results whose effectiveness is low. The high percentage of this type of students can be explained by the proportion of the fields of study; they were predominantly students of teaching curricula, where their interest in education in general can outweigh their interest in the special subject matter. This can be a source of their difficulties in studying, as well as the fact that they perceive the requirements of teachers as too high.

The students at UHK on average evaluate the university teaching on a 5-point scale as very good. They particularly value the teachers for the professional level and their willingness to communicate. On the contrary, the least appreciated aspect is the pedagogues' ability to provide feedback, to have adequate requirements and ability to help students to improve their methods of learning. The teachers are perceived as experts until a problem emerges. Then their ability to intervene is considered as average.

Evaluation by the full-time students is more critical compared to the older ones. Is this merely caused by their young age criticality or by stagnant communication between the generation of young students and older teachers? Significant differences also exist in the evaluation by the students of various fields of study. It can be seen that the students of social and pedagogical studies assess the quality of teaching more favourably in comparison with the students of foreign languages and natural sciences. These results can be connected with the more profound knowledge of the teachers of pedagogical disciplines in the field of the principles of learning, which often forms a part of their professional skills.

The subjective effectiveness of learning in the evaluation by the students is less favourable in comparison with the evaluation of the quality of teaching. Average evaluation by the students on a 5-point scale amounted to 2.7. An important finding is the fact that up to 40% of the students experience serious problems in studying. Self-confidence in the results of one's own learning grows with age, and differences in evaluation also exist in accordance with individual fields of study. The results can also be influenced by the fact that the monitored sample of students was formed by the students of Bachelor's courses, who are still in the phase of adapting to the new study environment.

The correlation analysis has confirmed the statistically significant positive relationship between the *perceived quality of the teaching factor* and the *subjective quality of the learning factor.* The students, who perceive teaching as a high quality process, are at the same time more satisfied with the effectiveness of their own learning and vice versa. This finding supports our anticipation related to the interaction of the study environment and approaches of students towards studying. At the same time, the finding is in compliance with the finding of Wankovski (1991), stating that success in study is connected with identification with the curriculum and work requirements which follow from the structure of the course.

The correlation of the identified types of students to the perceived effectiveness of their study has pointed out some risks. The students who are extremely orientated towards practice do not consider theory attractive, and because they prefer mechanical processing of the subject matter, they often have difficulty studying. Another risk type is the Unsuccessful in study type of student, who is professionally immature, which also applies to their personality, and even their above-average systematic approach can, in this case, take the form of adherence to stereotypical methods of learning which may cause serious studying problems.

Conclusions

Significant factors participating in the manner in which the student will approach his/her study include, in addition to the preference for cognitive processing, the motivation component and the degree of dependence/independence (autonomy). The identified types of students in principle correspond with Entwistle´s (1981) approaches to study: surface (Practitioner), deep (Theorist), strategic (Easy-going person), and apathetic (Unsuccessful in study) types. This also complies with the connection with learning effectiveness, where the Easy-going person type is by far the best of all in this respect. Assuming these findings from the interaction of the student's individuality and learning environment, the following question arises: to what extent does the currently valid higher education system appreciate mainly mechanical information processing and the ability to adapt as factors developing personalities that think autonomously and creatively?

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References

Cassidy, S., Eachus, P. (2000). Learning Style, Academic Belief Systems, Self-report Student Proficiency and Academic Achievement in Higher Education. *Educational Psychology*, Vol. 20, No. 3, pp. 307–322.

Diseth, A., Martinsen O. (2003). Approaches to Learning, Cognitive Style, and Motives as Predictors of Academic Achievement. *Educational Psychology*, Vol.23, No. 2, pp. 195–207.

Entwistle, N. (1981). S*tyles of Learning and Teaching:an integrated outline of educational psychology for students, teachers and lecturers,* Chichester, John Wiley.

Honey, P., Mumford, A. (1992). *The manual of learning styles*. Maidenhead, Peter Honey Publications, London.

Hoskovcová, S. (2006). *Psychická odolnost předškolního dítěte.* Praha, Portál.

Chlup, O. (1967). *Pedagogika.* Praha, SPN.

Janíková, V. (2007). *Autonomní učení a lexikální strategie při osvojování cizích jazyků.* Brno Masarykova univerzita.

Mareš, J., Skalská, H., Rybářová, M. (1995). A Czech version of Inventory of Learning Processes. *Sborník vědeckých prací, LF UK*, Hradec Králové.

Messick, S. (1987). Structural relationship across cognition, personality and style. In Snow, R.E., Farr, M.J. (Eds.) *Aptitude, learning and instruction.* Vol. 3, pp. 35–77.

Riding, R., Rayner, S. (1998). *Cognitive styles and learning strategies*. David Fulton Publishers, London.

Řehulková, J. (2007). Kognitivní styl, studijní styl a místo kontroly osobnosti. In: *Československá psychologie* , ročník LI, č. 3, pp. 253–278.

Vaněčková, K. (2010). *Kritéria kvalitní vysokoškolské výuky jako podklad pro hodnocení výuky studenty.* Dostupné z: < http://www.kpg.zcu.cz/capv/HTML/153/153.pdf>. [citováno: 15. 12. 2010].