The Undergraduate Medical Students' Approach to Learning in University of Latvia

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Abstract: Learning approach of medical students has been pointed out as one of the most important long term success factors for medical career. There are two major differences how students learn. One group of students use deep approach learning that is characterised by understanding of matter of studies. Other part of students using surface approach of learning that is based on memorisation of facts and knowledge. It has been recognised that deep approach learning is more used in modern medical schools but surface learning in traditional medical schools. The purpose of this study was to evaluate, describe and compare the learning approach of students at the University of Latvia in the academic year of 2009/2010. University of Latvia represents traditional medical school, which uses traditional curriculum. The assessment was done using Entwistle's Short Inventory of Approaches to Learning consisting of 30 items. The inventory was answered by a total of 345 students. Findings show that learning approach has trend towards surface approach of learning in six groups studied in the University of Latvia in year 2009/2010. It has been recognised that reproduction and learning pathology were found increased in all study years. Results might suggest that modernisation of undergraduate curriculum including assessment with target to improve the way how medical students learn could be topic of discussion in senior management of University of Latvia. Study allows compare findings of this study to similar studies where the same instrument is used for evaluation of learning approaches in longitudinal prospective. It gives opportunity to compare results within findings of medical schools of Europe.

Key words: Medical students, curriculum, educational measurement, learning approaches, learning style.

1. Introduction

One of the most outstanding features of teaching in traditional schools of medicine is that the cognitive aspects are the most emphasised ones. The curriculum is organised on pieces of information in different areas, which are considered necessary for students to learn in order to accomplish suitable practical work later during the postgraduate studies. Students use different strategies, tactics and skills in their studies [1-4]. There are three approaches to learning recognised: deep, surface and strategic [5, 6]. How medical students learn may have special implications for teaching and learning in a medical curriculum, particularly in activating and sustaining motivation. The current model of University of Latvia is centred in teaching where teacher is in the middle of educational process. Teachers controlling what, when and how will be done.

Little competence has been given to students themselves. Teacher's based educational process is based on the transmission of information to students [7-10]. Education is carried out through a defined way of delivering to the students some theoretical information through lectures and bringing them to the laboratory or to the hospital for practical work. It is known that teaching methods influence the way how students learn [10-17]. It has been also shown that assessments and examinations influence students' learning styles and approach to studying. Therefore, it can be expected that this definite way of teaching and evaluating has influence on the learning style of students who have undergone the same teaching model [18-20].

While the need for meaningful learning experiences for medical students has always been recognised, little enough is known about the learning tendencies lying within medical students for such experiences to be developed [21].

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The undergraduate curriculum of University of Latvia has been established in the Medical Faculty. More objective assessment forms were implemented [22, 23], such as objective structured clinical examinations. Library internet facilities have been implemented [9, 23].

This article will attempt to review the current information how students learn with particular relevance for the medical teacher and academic staff.

The purpose of this study is to describe the learning approach of students belonging of 6 different study years in the academic year of 2009/2010. It might be important to find out how students learn at the University of Latvia. Are they using deep approach with understanding or they tend to memorise subjects and pass exams? It will be highly interesting to see how learning approach changing during study period. How the learning styles of the University of Latvia Curriculum influence students. These findings might be taking into account when new curriculum created.

2. Approaches to Learning

The study followed the three approaches statement proposed by Newble et al. [24] and Entwistle et al. [25]. The three approaches to learning can be categorised by identifying the following characteristics: predominant factors, which motivate students, the primary intention of students, and the learning process, used to fulfil those intentions. According to these factors, the authors recognise three approaches to learning: deep, surface and strategic.

Students who adopt the deep approach are predominantly motivated by an interest in the subject material and/or recognition of vocational relevance; their study methods are addressed to understand meaning of a subject and relating it to previous knowledge and personal experiences.

Students presenting the surface approach are mainly motivated by either a desire simply to complete the course or a fear of failure; their goal is to pass the course and it is fulfilled mainly through memorising

and reproducing the material they believe is likely to appear in the evaluation tests.

The third approach to learning proposed by Newble et al. [24] and Entwistle et al. [25] is the strategic approach. The main motivation of the students who adopt this approach is competition and the achievement of high grades. They are prepared to use whatever means are necessary to achieve success, so they can elect to use either the surface or the deep approach, depending on which is necessary to get the most successful results.

3. Materials and Methods

3.1 The Subject

The curriculum of Faculty of Medicine of University of Latvia is a traditional one. According to the curriculum, the students' experience has a sequential, subject-based, teaching-centred model [26].

It is divided into two parts. The first part is the preclinical curriculum which deals with the basic sciences necessary for the understanding of medicine such as anatomy, histology, biology, chemistry, physics, physiology, etc.. This part of the course lasts for four terms. The students have no interaction with patients and the academic pressures are intense. Some adverse effect on motivation might be expected during these four terms because of lack of clinical input.

The second part of the curriculum starts in the fifth term although some subjects are continued to be preclinical ones. Medical students begin their clinical course. This is an important term as it forms as introduction to clinical studies and lays the basis forward work in the following terms. After these 6 years of undergraduate training, the graduates have to finish specialised internship and they can work as general practitioners.

3.2 The Instrument

A questionnaire was drawn up using the 30 items of Entwistle's Short Inventory of Approaches to Learning [5, 6]. This Inventory is a shortened version of Entwistle's

60-item Lancaster Approaches to Learning questionnaire and is answered on a scale from 4 (definitely agree) to 0 (definitely disagree). The Short Inventory was selected for an initial study to investigate students learning approaches in the Medical Faculty, University of Latvia. The same tool of assessment of learning approaches has been used in many of European and Worlds medical schools [23, 27, 28]. It has been investigated in Riga Stradins University in years 1994/1995 and 1999/2000. The questionnaire was translated from English into Latvian and evaluated by language professionals [21].

Each factor and its definition are shown in Table 1.

3.3 Sample

The study was conducted in the Faculty of Medicine, LU, and Riga, Latvia. In the academic year 2009/2010, the questionnaire was distributed to the class of each study year at the beginning of a small group session. The sample consisted of first year, second year, third year, fourth year, fifth year and sixth year students. The total number of students was 339. Students were asked

to complete them on the spot anonymously. The 30 items of the questionnaire plus study year formed the variables. The response rate in the year 2009/2010 for the questionnaire was 100%. Table 2 shows the student number that responded in every study year.

High response rate is explained by distribution of questionnaires in small group sessions and due to involvement of teacher. Results for each student on each variable on the combined scores were computed using SPSS (Statistical Package for the Social Sciences). The data were obtained using the independent test. Data of eight scales were analysed by using the Kolmogorov-Smirnov test that shows normal distribution of collected data. This allowed further analysis to perform by parametric methodology that gave opportunity to see differences between study years—ANOVA (analysis of variance) was used to evaluate differences.

4. Results

The Entwistle's Short Inventory of Approaches to Learning was answered by a total of 339 students in the

Table 1 Inventory scales and their meaning.

Inventory scales	Meaning of scales
Achieving	"Strategic" approach Organised study methods Competitiveness Motivated to achieve
Reproducing	"Surface" approach Rote-learning and memorisation Extrinsically motivated Influenced by lure of qualifications
Meaning	"Deep" approach Interested in medicine for itself Intrinsically motivated
Comprehensive learning	"Holist" approach Broad perspective of learning task Relates concepts to wider context
Operation learning	"Serialist" approach Step-by-step sequential and detailed approach
Improvidence	Jumping to conclusions on insufficient evidence
Globetrotting	Over-emphasis on details
Versatility	Ability to adopt either approach according to demands of learning task
Learning pathologies	Failing to see how topics fit into overall picture Best prediction for overall academic success highly organised study methods with versatile approach
Prediction to success	Strong motivation Some tendency towards competitiveness Lack of doubts or fear to failure

Table 2 Total No. of questionnaires distributed and returned in the academic year of 2009/2010 for students in six different study years.

The year of study	Total number of students	Total number of distributed questionnaires	Total number of returned questionnaires	Returned questionnaires in %
Year one	143	102	102	100
Year two	86	59	59	100
Year three	106	54	54	100
Year four	73	56	56	100
Year five	60	43	43	100
Year six	31	25	25	100
Total	499	339	339	100

year of 2009/2010 at the University of Latvia, Faculty of Medicine. Each individual received a score according to his/her answers. The average of all individual scores for each category was obtained in each study year. Similar study has been performed by author also in 1994/1995 and 1999/2000 study years that allows give some insight by comparing learning approaches in longitudinal period (Table 3). Previous studies were carried out at Riga Stradins University.

Comparing overall differences statistically significant differences ($P \leq 0.05$) were found in scales of reproduction, learning pathologies and prediction of

success. Other differences were not statistically significant ($P > 0.05$).

Comparing achievement/motivation scale in Year 1 and in Year 6 scores indicates substantial differences at the 5% level of significance. It has been recognized that last year students have higher motivation comparing with learners in study Years 3, 2 and 1.

Comparing reproduction scale for Year 1, Year 3 and Year 5 scores indicates substantial differences at the 5% level of significance. Year 3 students has lower tendency to memorize knowledge to compare with Year 1 students but at their Year 5 reproduction score

Table 3 Inventory data means and standard deviations (SD) for different year students in the year 1994/1995, 1999/2000 and 2009/2010.

	Year 1			Year 2			Year 3			Year 4			Year 5			Year 6		
	94/95	99/00	09/10	94/95	99/00	09/10	94/95	99/00	09/10	94/95	99/00	09/10	94/95	99/00	09/10	94/95	99/00	09/10
Achievement motivation	16.36	16.18	15.88	16.14	15.79	15.93	14	15.08	15.24	15.43	15.09	16.38	13.98	15.06	16.44	14.14	15.69	17.6
SD	3.18	3.95	3.29	2.46	3.32	3.49	3.18	3.5	2.63	3.77	3.15	3.2	3.29	3.73	4.03	3.65	3.85	4.19
Reproducing	16.76	16.39	17.3	15.72	16.52	16.07	15	15.26	15.49	16.31	16.96	16.12	16.98	15.56	17.42	16.6	15.71	16.33
SD	3.77	4.18	3.91	4.8	3.34	3.32	4.18	3.92	3.79	3.42	4.03	3.46	3.45	3.53	4.62	3.46	3.6	4.55
Meaning	15.42	15.35	17.27	16.86	15.93	16.53	15.45	14.97	16.29	17.2	15.78	17.02	14.19	14.44	16.74	14.51	14.74	16.88
SD	3.73	4.27	3.02	3.15	3.31	3.32	3.05	3.34	2.96	7.87	2.88	3.41	4.03	2.96	4.11	3.59	3.94	3.8
Comprehensive learning	14.97	14.08	14.1	14.59	14.48	13.81	14.35	14.15	14.44	14.97	15.65	13.98	15.48	13.94	14.96	16.4	13.44	15.72
SD	3.14	2.91	2.77	2.5	2.52	2.61	3.67	3.06	2.82	3.25	2.79	2.85	3.49	2.15	4.16	2.93	3.75	3.61
Operation learning	13.48	12.85	13.5	11.27	11.93	12.49	11.15	11.18	13.33	12.68	11.63	13.38	12.1	12.53	13.52	12.8	11.07	14.36
SD	3.48	3.71	3.58	3.13	2.96	3.69	3.66	2.96	3.64	3.17	3.13	3.41	3.48	3.73	5.24	3.51	3.04	5.1
Versatility	32.79	31.48	34.17	33.93	32.64	34.29	34.7	31.92	34.47	35.14	33.35	35.4	30.53	31.31	33.79	31.94	30.58	35.4
SD	5.55	7.11	5.07	5.28	5.39	5.58	5.41	6.3	5.41	8.17	3.87	5.7	5.01	4.86	7.37	5.5	6.38	6.14
Learning pathologies	27.85	27.08	28	24.52	26.21	24.77	24.35	23.64	24.96	26.03	23.7	24.98	28.25	25.16	28.84	28.37	24.11	27.54
SD	6.05	6.91	6.45	7.15	5.52	5.76	6.72	6.51	5.96	5.95	5.34	5.74	6.42	4.86	9.45	5.26	6.43	9.4
Prediction of success	69.3	68.59	70.07	73.55	70.21	73.15	69.35	71.36	72.84	72.54	72.74	74.74	64.23	65.16	69.13	65.1	65.13	72.92
SD	9.42	12.9	9.54	9.96	10.26	9.52	10.52	11.4	10.03	11.04	7.69	9.05	10.21	4.86	12.31	7.27	6.35	7.35

risers back to the level of first year and stays high until the end of Medical School.

There were no statistically significant differences in scale of meaning for students in different study years.

Comparing scale of comprehensive learning results shows statistically significant higher scores for the Year 6 students to compare with learners from Year 1, 2 and 4. Last year students might be characterized as meaningful learners.

Comparing scale of comprehensive learning scores shows statistically significant higher meaning and comprehensive learning scores in Year 4 with a less orientation towards reproducing.

Comparing Year 4 and Year 5 scores shows non-significant higher reproducing score in Year 5 with a decrease of score for meaning.

Looking at learning pathologies significant differences have been recognized for study Year 1 and study Year 5 that shows statistically significant higher usage of learning pathologies.

Comparing prediction of success scale, it has been recognized that students try to achieve best results during their Year 4 of studies to compare with study Year 1 and the study Year 5. At the end of studies, students have attempting their best academic achievements above the average of study period.

5. Discussion

In the world of medical education the most attention has been given to the evaluation of the curriculum, conduction of assessment and implementation of modern technologies. Little attention is directed to the way students learn [8, 25, 29-31].

A finding of this study is that, the learning approach has trend towards surface approach of learning in six groups studied in the University of Latvia in year 2009/2010. Study results of 2009/2010 shows statistically significant improvement of achievement motivation and comprehensive learning in Year 6. This trend has not been identified in previous investigations 1994/1995 and in 1999/2000 [22]. It has been

recognised that improvement is only in last year of their studies. However, scores for reproduction and learning pathology were found high within all study years. It is reasonable to expect that the educational experiences of the students during their undergraduate education could have modified progressively by using deep approach of learning [1-3, 5, 28, 32-34].

The results reported in this paper showed a similar pattern of learning approach in 228 students of six different levels in two years of traditional school of medicine in Riga, who answered Entwistle's Short Inventory of Approaches to Learning with 30 items in 1994/1995 and in 1999/2000 [22]. The founding suggested that students tend to be surface and strategic learners more than deep approach users [22].

The achievement motivation in the academic year 1999/2000 is significantly higher in Year 6 compared with the academic year 1994/1995 that highlighted probability of positive results of elements of modernisation of curriculum. It should be pointed out that motivation is not decreasing during the six study years but stays on the same level compared with study conducted in the year 1994/1995. The same study was conducting in modernised medical schools. Students in modernised medical schools has been found as deep approach learners to compare with surface approach learners in traditional medical schools and during studies they adopt deep approach learning habits versus traditional medical schools [9, 27, 34].

Results might suggest that modernisation of undergraduate curriculum with target to improve the way how medical students learn could be topic of discussion in senior management of University of Latvia.

In this study, it was not possible to incorporate student assessment of important environmental factors such as the context of learning, influence of curriculum, new technologies and impact of stress, social circumstances and teaching styles.

A further study could be developed with a follow-up of students involved in the investigation. This should

allow the establishing a valid comparison for the same group of students in different stages of the curriculum.

The independent study in learning approaches could take place sometime after graduation from a medical school to see “deep” and “surface” approach students’ evaluation and their achievements of carrier.

The feedback session on the results of this study could help students to see what teachers expect from them.

It would be valuable to see further investigations of approaches to learning with a view to modifying education strategies for traditional medical schools as the Riga Stradins University and the Faculty of Medicine, University of Latvia.

6. Conclusions

Findings reported in this article showed a similar pattern of learning approach in 339 medical students of six years of studies of University of Latvia. Data suggests that progression through the traditional curriculum is associated with a more surface approach to learning than progression through modernised medical curriculum.

The study opens that study methods of learners are not constantly addressed to understand its meaning and to relating it to previous knowledge and personal experiences. Despite of fact that Inventory data highlights Year 6 students have more achievement, motivation and comprehensive learning to compare with beginning of the studies overall students tend to learn by memorisation and acquiring facts. It is more likely that students use surface approach to reach requests of academic personnel and to meet objectives of the curriculum. This article suggests continuing research to find in details importance of assessment, learning methods, impact of curriculum on way how students learn.

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References

- [1] M. Komarraju, S.J. Karau, The relationship between the big five personality traits and academic motivation, *Personality and Individuals Differences* [Online early access]. DOI: 10.1016/j.paid.2005.02.013, Published Online: Apr. 12, 2005, <http://www.sciencedirect.com/science/article/pii/S0191886905000632#> (accessed Dec. 10, 2013).
- [2] J.C.C. Chung, S.M.K. Chow, Promoting student learning through a student-centred problem-based learning subject curriculum, *Innovations in Education and Teaching International* 41 (2) (2004) 157-168.
- [3] A. Klegeris, H. Hurren, Impact of problem-based learning in a large classroom setting: Student perception and problem-solving skills, *Advances in Physiology Education* 35 (4) (2011) 408-415.
- [4] C.F. Smith, H.S. Mathias, Medical students’ approaches to learning anatomy: Students’ experiences and relations to the learning environment, *Clinical Anatomy* 23 (1) (2010) 106-114.
- [5] W.A. Reid, E. Duvall, P. Evans, Can we influence medical students’ approaches to learning?, *Medical Teacher* 27 (5) (2005) 401-407.
- [6] W.A. Reid, P. Evans, E. Duvall, Medical students’ approaches to learning over a full degree programme, *Med. Educ.* Online. [Online], 17 (2012) 1, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3427928/> (accessed Jan. 10, 2013).
- [7] E. Driessen, J. van Tartwijk, C. van der Vleuten, V. Wass, Portfolios in medical education: Why do they meet with mixed success? A systematic review, *Med. Educ.* 41 (12) (2007) 1224-1233.
- [8] L. Samarakoon, T. Fernando, C. Rodrigo, Learning styles and approaches to learning among medical undergraduates and postgraduates, *BMC Med. Educ.* 13 (2013) 42-47.
- [9] R. Velins, V. Pirags, J. Vetra, V. Zirdzins, E. Nagle, I. Upeniece, Tomorrow’s doctor in Latvia, *Scientific Articles of Medical Academy of Latvia* (1996) 20-23.
- [10] S. Buckley, J. Coleman, I. Davison, K.S. Khan, J. Zamora, S. Malick, The educational effects of portfolios on undergraduate student learning: A Best Evidence Medical Education (BEME) systematic review, *Medical Teacher*

- 31 (4) (2009) 282-298.
- [11] V. Donche, S. De Maeyer, L. Coertjens, T. Van Daal, P. Van Petegem, Differential use of learning strategies in first-year higher education: The impact of personality, academic motivation, and teaching strategies, *The British Journal of Educational Psychology* 83 (2) (2013) 238-251.
- [12] S.A. Jessee, P.N. O'Neill, R.O. Dosch, Matching student personality types and learning preferences to teaching methodologies, *J. Dent. Educ.* 70 (6) (2006) 644-651.
- [13] R. Oliver, H. Kersten, H. Vinkka-Puhakka, G. Alpasan, D. Bearn, I. Cema, et al., Curriculum structure: Principles and strategy, *European Journal of Dental Education* 12 (Suppl. 1) (2008) 74-84.
- [14] R.W. Sanson-Fisher, I.E. Rolfe, N. Williams, Competency based teaching: The need for a new approach to teaching clinical skills in the undergraduate medical education course, *Medical Teacher* 27 (1) (2005) 29-36.
- [15] E.H. Morrison, J.F. Shapiro, M. Harthill, Resident doctors' understanding of their roles as clinical teachers, *Medical Education* 39 (2) (2005) 137-144.
- [16] A.V. Blue, M. Mitcham, T. Smith, J. Raymond, R. Greenberg, Changing the future of health professions: Embedding inter professional education within an academic health center, *Acad. Med.* 85 (8) (2010) 1290-1295.
- [17] P.L. Nandi, J.N.F. Chan, Undergraduate medical education: Comparison of problem-based learning and conventional teaching, *Hong Kong Med. J.* 6 (3) (2001) 301-306.
- [18] M. Zoghi, T. Brown, B. Williams, L. Roller, S. Jaberzadeh, C. Palermo, et al., Learning style preferences of Australian health science students, *J. Allied Health* 39 (2) (2010) 95-103.
- [19] P. Kharb, P.P. Samanta, M. Jindal, V. Singh, The learning styles and the preferred teaching-learning strategies of first year medical students, *J. Clin. Diagn. Res.* 7 (6) (2013) 1089-1092.
- [20] F.L. Mialhe, C.M. Silva, Health education and their representations among dental Students, *Cien. Saude. Colet.* 16 (Suppl. 1) (2011) 1555-1561.
- [21] R. Velins, An investigation of approaches to learning with a view to modifying education strategies in the Medical Academy of Latvia, M.D. Thesis, University of Dundee, 1996.
- [22] R. Velins, The approach to learning in medical academy of Latvia, RSU Collection of Scientific Papers: Research articles in medicine & pharmacy: Internal medicine, surgery, medical basic sciences, pharmacy, (1) (2006) 264-270.
- [23] P. Rego, R. Peterson, L. Callaway, M. Ward, C. O'Brien, Using a structured clinical coaching program to improve clinical skills training and assessment, as well as teachers' and students' satisfaction, *Medical Teacher* 31 (12) (2009) 586-595.
- [24] D.I. Newble, R.M. Clarke, The approaches to learning of students in a traditional and in an innovative problem-based medical school, *Medical Education* 20 (1986) 267-273.
- [25] D.I. Newble, N.J. Entwistle, E.J. Hejka, B. Jolley, G. Whelan, Towards the identification students learning problems: The development of a diagnostic inventory, *Medical Education* 22 (1988) 518-526.
- [26] A.M. Villanueva, M.E. Hovinga, J.L. Cass, Master of public health community-based practicum: Students' and preceptors' experiences, *J. Public Health Manag. Pract.* 17 (4) (2011) 337-343.
- [27] W.A. Reid, E. Duvall, P. Evans, Relationship between assessment results and approaches to learning and studying in Year Two medical students, *Medical Education* 41 (8) (2007) 754-762.
- [28] C.F. Smith, H. Mathias, An investigation into medical students' approaches to anatomy learning in a systems-based prosection course, *Clin. Anat.* 20 (7) (2007) 843-848.
- [29] A.L. Kinmonth, J. Lazovskis, Letter from Latvia: Surviving surveillance, *BMJ* 302 (6786) (1991) 1192-1194.
- [30] E. Gurpinar, E. Kulac, C. Tetik, I. Akdogan, S. Mamakli, Do learning approaches of medical students affect their satisfaction with problem-based learning?, *Adv. Physiol. Educ.* 37 (1) (2013) 85-88.
- [31] K. Mattick, I. Dennis, J. Bligh, Approaches to learning and studying in medical students: Validation of a revised inventory and its relation to student characteristics and performance, *Med. Educ.* 38 (5) (2004) 535-543.
- [32] M. Groves, Problem-based learning and learning approach: Is there a relationship?, *Adv. Health Sci. Educ. Theory Pract.* 10 (4) (2005) 315-326.
- [33] N. Abdelkhalek, A. Hussein, T. Gibbs, H. Hamdy, Using team-based learning to prepare medical students for future problem-based learning, *Med. Teach.* 32 (2) (2010) 123-129.
- [34] V. Woltering, A. Herrler, K. Spitzer, C. Spreckelsen, Blended learning positively affects students' satisfaction and the role of the tutor in the problem-based learning process: Results of a mixed-method evaluation, *Adv. Health Sci. Educ. Theory Pract.* 14 (5) (2009) 725-738.